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IS 11210 (1984): Code of practice for stains removal from textiles and clothing [TXD 5: Chemical Methods of Test]



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Indian Standard

CODE OF PRACTICE FOR
STAINS REMOVAL FROM
TEXTILES AND CLOTHING

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

CODE OF PRACTICE FOR STAINS REMOVAL FROM TEXTILES AND CLOTHING

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(*Continued on page 2*)

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(Continued from page 1)

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Indian Standard

CODE OF PRACTICE FOR STAINS REMOVAL FROM TEXTILES AND CLOTHING

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 14 December 1984, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 Stains, whether on fabric or on garments, are unwelcome. On fabrics, they reduce the consumer appeal; so pieces containing stains have to be marketed at low prices as seconds and fents. On a garment, they generate a tendency for avoiding its use. Proper removal of stains is, therefore, important for the launderers and drycleaners, as well as at home.

0.3 Textile fabrics are of large varieties and complexities in their chemical and physical composition. Also the stains are often complex in nature since a stain may be composed of several staining substances. Stains of various types are apt to occur from time to time during the manufacturing processes and in actual use. This standard prescribes general guidelines for removal of spots and stains effectively and economically in the common household, as well as it provides the dry-cleaner with ready references to stain removing chemicals and the methods of their applications.

1. SCOPE

1.1 This standard prescribes general guidelines for the removal of various types of spots and stains on textiles and clothing that may be encountered during every day use. It also provides general information, precautions, method of treatments and identification of various types of spots and stains occurring on textiles and clothing.

2. GENERAL INFORMATION AND PRECAUTIONS

2.1 Remove the stains promptly because easeness with which it can be removed depends upon time. The chances of complete removal lessen as time goes by, and old stains are sometimes impossible to remove.

IS : 11210 - 1984

2.2 Determine whether the cloth is washable or non-washable. A tag or label may reveal this information or, if this is lacking, it may be considered washable if it has been previously washed successfully.

2.3 Give careful treatment and time to act for stain remover. Work lightly and rapidly. Vigorous rubbing is often injurious to cloth, its colour or its finish.

2.4 Test the stain remover and use it sparingly. Test the stain remover on an inconspicuous spot, such as an unexposed seam or hem. Observe whether it injures the colour or dye or finish or the fibre and select suitable stain remover. Better results are obtained by many short applications than one long one.

2.5 Use light brushing motions starting well outside the stain and brushing towards the centre.

2.6 Flush out the stain remover or any chemical which has been used for the purpose of neutralizing acid or alkaline stain. Avoid the use of strong acids and alkalis which weaken the cloth.

2.7 Dry the treated area rapidly which avoids damage due to the prolonged action of the solvent.

2.8 Keep the brush, spatula, working area clean. After use, rinse the brush well and hang it to dry.

2.9 Dry the area after using water-soluble stain removers and then only use non-water-soluble solvents if required.

2.10 Treat a wet stain carefully. Avoid scratching or working the stain too strongly.

2.11 Soften a hard stain with the recommended softener because otherwise there is risk of breakage of fibres during rubbing.

2.12 Detergents may contain alkalis that could set some stains. So test prior to their use as in 2.4.

2.13 Avoid forcing staining material into the fabric.

2.14 Remove built up stains with a spoon.

2.15 Do not allow dry cleaning solvent to come in contact with skin.

2.16 Work in a ventilated area. Avoid breathing solvent fumes.

2.17 Any unidentified stain should be treated with the dry procedure first and then with the wet procedure, if necessary (see 4.1).

2.18 Do not use chlorine bleaches on fabrics that contain silk, wool, elastane or special finishes unless the label states that it is safe to use

chlorine bleach. Test all dyed fabrics before using chlorine bleach. Do not put bleach solution in a metal container.

2.19 Taffeta (silk) fabrics should always be kept smooth during cleaning otherwise permanent wrinkles and even splitting of the fabric may occur. Tapping and light brushing should be used for this fabric.

2.20 In case of chiffon fabric (silk and rayon) light tapping is best but brushing should be avoided. A crinkled crepe chiffon may take water spots and react unfavourably to many spotting agents. So stain remover should be tested before use as in **2.4**.

2.21 While cleaning mousseline de soie (silk) fabrics, it is preferable to stretch the area involved by means of embroidery hoops and mechanical action should be avoided.

2.22 Wetting an area of pongee, shantung, tussah (silk) fabrics changes the appearance which should be rectified by dipping the whole fabric in the cleaning fluid.

2.23 It is preferred to work on the underside of the satin fabrics and give tapping motion. Creasing and pinching should be avoided because this will damage the surface.

2.24 In case of crepe fabrics light tapping motion is preferred.

2.25 Vigorous action should be avoided on pile fabrics and they should be worked on the back side of pile to prevent possibility of pulling out of the pile fibres. After stain removal, drying should be slow so that the pile can be brushed to hold its original position. Acetate rayon velvets should be treated with dry stain removers because wetting causes the pile to lose its original form.

2.26 In case of woollen suitings, vigorous action should be avoided as it causes permanent felting of fibres on the surface. Wool, because of its tendency to shed water is likely to form rings after stain removing treatment. So it is usually preferred to dry-clean the whole fabric after spotting to give it uniform appearance.

3. IDENTIFICATION OF FIBRES AND STAINS

3.1 Identify the fibre(s) as given in IS : 667-1981* by simple preliminary test.

3.2 Identify the stains as far as possible by the following parameters.

3.2.1 Colour — For example, a red colour often identifies a lipstick stain, the brown colour an iodine stain.

*Methods for identification of textile fibres (*first revision*).

3.2.2 Appearance of the Surface of Fabric — For example, ink penetrates a fabric surface; paint builds up on a fabric.

3.2.3 Shape — For example, stain follow the yarns with the least degree of twist in a fabric. If the yarns are of equal twist in both the warp and the weft, a perfect cross will appear.

3.2.4 Ultraviolet Light — Under ultraviolet or black light, rust stains look black; stains on polyester glow; sugar stains flourescess. The breakdown of a flourescent dye or tint appears grey.

3.2.5 Odour — For example perfume, cold wave-solution (faint odour of bromine), or medicinal stains.

3.2.6 Location — Perspiration stains occur in the under arm area of a suit or blouse, food stains on ties and on dress or suit fronts.

3.2.7 Feel — Egg may be recognized by its stiffness, glue and adhesive are sticky, paint may be rough or smooth, nail polish may be built upon the fabric surface.

4. GENERAL PROCEDURES AND TREATMENTS

4.1 Spotting

4.1.1 Dry Procedure

4.1.1.1 Place a towel under the stained area. White towel is preferable.

4.1.1.2 Apply the solvent to the stain. Saturate the area with solvent.

4.1.1.3 Rub the stain lightly with fingertips. Do not press it into the fabric. Let the solvent loosen the staining substance and rinse it through the fabric into the towel. Continue rubbing with the fingers until the staining material is gone.

4.1.1.4 Remove the towel.

4.1.1.5 Moisten a piece of cheese cloth with the cleaning solvent and wipe lightly around the outside edges of the spotted area. Wipe towards the centre. This is to prevent a ring.

4.1.1.6 Allow to dry.

4.1.2 Wet Procedure

4.1.2.1 Place a towel under the stained area. White towel is preferable.

4.1.2.2 Apply plain, cool water to stain. Do not mix it with anything. Saturate the stained area.

4.1.2.3 Rub-lightly with finger tip to loosen the stain so that it will wash through the fabric into the towel.

4.1.2.4 If water alone does not loosen the stain, add liquid detergent and work similarly with the finger tips.

4.1.2.5 Then wet a cheese cloth heavily with water and squeeze over the stained area to flush out the detergent. Detergent left in the fabric can cause a ring.

4.1.2.6 When the stain and detergent have both been washed out, remove the towel.

4.1.2.7 Then wipe with a wet cheese cloth around the edges of the stained area to prevent a ring. Wipe toward the centre.

4.1.2.8 Allow to dry.

NOTE — In both the procedures given above, check frequently to see whether the staining substance has transferred to the towel. Change the position of the towel so that a clean portion of it is next to the stained area.

4.2 Chemical Treatment

4.2.0 For stains that require chemical stain removers, follow the procedure given below.

4.2.1 Place absorbent towel under stain.

4.2.2 Dampen stain with cool water.

4.2.3 Apply chemical remover (liquid) with medicine dropper, or sprinkle powdered or crystalline removers on the dampened spot.

4.2.4 Do not allow stain remover to dry on fabric. Keep area wet with a pad of cotton or cheese cloth, wet out with the stain remover solution. Use a pad dampened with water if a powder or crystalline stain remover is being used.

4.2.5 Rinse stain removal solution or powder from washable fabric locally with water or rinse the entire garment/fabric in water.

4.2.6 If fabric is dry cleanable, follow above procedure locally. Do not rinse entire garment in water.

NOTE — Try mild treatment first. For a stronger treatment, lengthen the time of treatment and/or use a more concentrated stain remover solution.

4.3 Bleaching Treatment

4.3.0 For bleaching treatment, follow the procedure as given below.

4.3.1 *Chlorine Bleach*

4.3.1.1 Use sodium hydrochlorite solution containing 1 g/l available chlorine for mild treatment. For strong treatment, use sodium

hypochlorite solution containing 3 g/l available chlorine, *Max.* Maintain a pH of 9.5 to 10.5 by adding sodium silicate.

4.3.1.2 Use medicinal dropper to apply to small stains; soak larger stains in solution.

4.3.1.3 Treat for 5 to 15 min at room temperature. Rinse with water. Repeat if necessary to bring stained area at pH of 7 to 7.5.

NOTE 1 — Do not use sodium hypochlorite bleach on fabrics that contain silk, wool, elastane, polyester, nylon or special finishes unless the label or hand tag states it is safe to use sodium hypochlorite.

NOTE 2 — Test all dyed fabrics before using chlorine bleach. Follow directions on package for powder or granulated bleach.

4.3.2 *Powdered Peroxygen Bleaches*

4.3.2.1 Use 3-5 g of powdered bleach mixed with 100 ml of lukewarm water (35-40°C), for use on silk, wool, modacrylic fabrics. Use hot water (50-60°C), for other fabrics. Maintain a pH of 8.5-9.5 by adding sodium carbonate, if required.

4.3.2.2 Cover stained area with solution or soak entire article for 5-15 minutes. Rinse well or wash.

NOTE — For dry-cleanable fabrics sprinkle 3-5 g of powdered peroxygen bleach on stain. Cover with a cotton pad dampened with lukewarm water. Keep damp until stain is removed. Rinse well.

4.3.3 *Hydrogen Peroxide and/or Sodium Perborate Bleach*

4.3.3.1 Moisten the stain with a few drops of 3 percent hydrogen peroxide and/or 2 g/l sodium perborate solution at a temperature of 50 to 60°C. Maintain a pH of 8.5 to 9.5 by adding sodium carbonate, if required.

4.3.3.2 Add hydrogen peroxide/sodium perborate solution as needed to keep the stained area moist until stain is removed. Rinse well.

5. APPARATUS

5.1 Good Light Source — to observe effectiveness of cleaning operations.

5.2 Spotting Brush — for loosening and removing particles of stains — Medium bristle brush with a handle.

5.3 A Clean Smooth Surface — A board, glass, or enamel surface, etc, to provide an efficient means of spreading out the stained area.

5.4 Dye Pads, Dye Pencils, Crayons — As means of restoring colour.

5.5 Magnifying Glass (10 to 20 Magnification) — to identify the cloth, to examine a pretreated stain, and then to observe the progress of stains removal.

5.6 Spatula — For working the stain-remover into the stain and for breaking up a stain built upon the surface.

NOTE — It must be used with care, however, since it may injure the fibres of the cloth.

5.7 Absorbent Material — Cheese cloth, white blotting paper, white towel, cleansing tissue, etc, to be placed under the stained area which absorbs excess liquids and prevent spreading to untreated areas.

5.8 Bottles — with attached droppers for holding the various cleaning agents and serving as a convenient means of applying them.

5.9 Sponge — useful in taking up excess liquids.

5.10 Electric Fan — For quick drying after a cleaning operation.

6. STAIN REMOVING AGENTS

6.0 Quality of Agents — Unless otherwise specified pure chemicals shall be used. A pure chemical is one which does not contain impurities that affect the results desired.

6.1 Pre-spotters

6.1.1 Dry Spotter — It consists of one part coconut oil to eight parts dry cleaning solvent by mass. If coconut oil is not available, mineral oil may be used.

6.1.2 Wet Spotter — It consists of one part hand dish washing detergent, one part glycerine and eight parts water by mass.

6.2 Absorbent Powders — Chalk, starch, talc, corn meal, flour, fuller's earth, etc.

6.3 Dry Cleaning Solvents — Carbon tetrachloride; perchloroethylene; trichloroethylene; denatured alcohol; petroleum based solvents, for example, naphtha, gasoline; amyl acetate (chemically pure); benzole; chloroform; acetone; benzene; ethylacetate; and glycol ethyl ether.

NOTE — Denatured alcohol is flammable, poisonous and fades some dyes. Amylacetate is flammable, poisonous.

6.4 Protein Digestants — These are enzyme preparations capable of converting insoluble albumin, protein and starch into water soluble substances. They should not be used for protein fibres or on fabrics converting a finish or size consisting of such proteins as casein or casein like substance. It is preferred to test these agents on an inconspicuous portion on the fabric before use.

6.5 Detergents — Soap solution concentrate consisting of soft soap based on potassium, liquid detergents, and soapless shampoo.

6.6 Acids — Acetic acid solution (5-10 percent, *m/v*) or citric acid solution (5 percent, *m/v*), oxalic and hydrochloric acid (1 g/l).

6.7 Alkalis — Ammonium hydroxide solution (10 percent, *m/v*).

6.8 Oxidising or Bleaching Agents — Hydrogen peroxide solution 3 percent, hydrogen peroxide-sodium perborate solution (2 g of sodium perborate per litre of 3 percent hydrogen peroxide solution), sodium chlorite solution, and sodium hypochlorite solution, etc.

NOTE — Chlorine bleaches are poisonous.

6.9 Oils and Lubricants — Mineral oil, pine oil, glycerine, turpentine oil, coconut oil, kerosene oil, and banana oil.

6.10 Mild Tincture of Iodine

6.11 Sodium Silicate Solution — 1 percent (*m/v*).

6.12 Sodium Thiosulphate Crystals or Solution — 10-20 percent *m/v*.

7. METHODS FOR REMOVAL OF SPOTS AND STAINS

7.0 General — No single procedure, or basic method exists for the removal of the hundreds of different types of stains that occur on the variety of fabrics used in wearing apparel and household items. Most stains can be classified into one of nine 'families' or 'groups'. All the stains in each of these families or groups are removed by almost similar procedure and with same or similar stain removing agents. However, a few stains are too complex to fit into one of these groups, and will require more varied removal procedures. Some of them are listed at the end under 'Miscellaneous Stains'. The procedures given under each group are general guidelines for the users serving as ready reference and suitable treatment as given in each group is to be selected by the user depending upon the need for removal of stain, nature and intensity of stain, the structure and composition of the fabric and that of the stain removing agent. Relevant procedures given under 4 should be followed for each type of treatment given in 7. When the user has no knowledge of the cause of stain, procedure given under 8 may be followed.

NOTE — Quick reference chart is given in Appendix A for some important spots and stains removing chemicals from clothing and garments.

7.1 Group I — Fats, Oils, Waxes, Grease, Some Pigments and Dyes

7.1.0 The stains included in this group and their solvents are given below:

<i>Stains</i>	<i>Solvents</i>
Adhesive tape	Carbon tetrachloride
Crayon	Naphtha
Dye-shoe polish	Carbon tetrachloride
Eye-liner, pencil, shadow, mascara	Carbon tetrachloride or perchloroethylene
Grease, oil	Carbon tetrachloride or perchloroethylene or trichloroethylene
Hairy spray	Carbon tetrachloride
Ink-India, felt tip, marker, typewriter ribbon	Naphtha, gasoline
Insecticides	Naphtha, gasoline
Lotion: Calamine, hand	Naphtha, gasoline
Make up: Powder, rouge	Naphtha, gasoline
Nosedrops	Naphtha, gasoline
Ointment	Naphtha, gasoline
Paint	Kerosene oil, turpentine oil, alcohol, benzene or carbon tetrachloride
Smoke, soot	Naphtha
Tar	Carbon tetrachloride, glycolethylether
Wax-car, floor, furniture	Carbon tetrachloride

NOTE — Any dry solvent may be used. Solvents listed under **7.1.0** are generally used for individual spot or stain.

7.1.1 Method of Removal

7.1.1.1 Washable fabrics — Sponge with dry-solvent, apply dry spotter, and rub gently. Flush with dry solvent. If stain remains, repeat above procedure. Dry, sponge with water, apply wet spotter and ammonia. Rub gently with brush. Rinse with water, launder.

7.1.1.2 Dry cleanable fabrics — Same as for washable fabrics, but do not launder.

7.2 Group II — Food Stains Containing Oils and Fats

7.2.0 The stains included in this group are as under:

<i>Stains</i>	<i>Solvents</i>
Catsup	Carbon tetrachloride
Chilli sauce	Carbon tetrachloride
Chocolate	Alcohol
Cocoa	Alcohol
Cream	Carbon tetrachloride
Gravy	Carbon tetrachloride
Ice cream	Carbon tetrachloride
Mayonnaise	Carbon tetrachloride
Milk	Carbon tetrachloride
Pudding	Carbon tetrachloride
Salad dressing	Carbon tetrachloride
Sauce	Carbon tetrachloride
Soup	Carbon tetrachloride

NOTE — Though solvents are mentioned against each spot or stain yet any dry solvent as given in 6.3 may be used.

7.2.1 Method of Removal

7.2.1.1 *Washable fabrics* — Sponge with dry solvent, apply dry spotter, and rub gently. Flush with dry solvent and dry. Soak in water solution of detergent and ammonia. Rinse with water. Soak in water solution of enzyme product for 30 min. Launder. Repeat if stain remains.

7.2.1.2 *Dry-cleanable fabrics* — Sponge with dry solvent, apply dry spotter, and rub gently. Flush with dry solvent and dry. Sponge with water. Apply wet spotter and ammonia. Rub.

7.3 Group III — Albuminous and Starchy Materials and Foods

7.3.0 The stains included in the group are as follows:

Bath oil
Blood
Body discharge
Egg
Egg drops
Fish slime
Leather
Lotion, after shave
Mouth wash

Mucus
 Sherbert
 Starch
 Vomit

7.3.1 Method of Removal

7.3.1.1 Washable fabrics — Soak in water solution of detergent and ammonia. Rinse with water. Soak in water solution of an enzyme product for 30 minutes. Launder. Repeat if stain remains.

7.3.1.2 Dry-cleanable fabrics — Sponge with water. Apply wet spotter and ammonia. Rub into stain. Rinse with water. Add an enzyme product and keep area moist for 30 min. Flush with water. Repeat if stain remains.

7.4 Group IV — Plastics, Some Pigments and Dyes

7.4.0 The stains included in this group and the corresponding solvents are as under:

<i>Stains</i>	<i>Solvents</i>
Airplane glue	Carbon tetrachloride
Carbon paper	Carbon tetrachloride
Cement, household	Carbon tetrachloride
Corn removers	Carbon tetrachloride
Correction fluid, mimeograph	Carbon tetrachloride
Cuticle oil	Carbon tetrachloride
Cuticle remover	Carbon tetrachloride
Fingernail polish	Amylacetate
Lacquer	Carbon tetrachloride
Mimeograph ink	Carbon tetrachloride
Mucilage, paste	Carbon tetrachloride
Plastic	Carbon tetrachloride
Plastic glue	Carbon tetrachloride
Solder, liquid	Carbon tetrachloride
Typewriter ribbon	Carbon tetrachloride, gasoline

NOTE — Instead of carbon tetrachloride any other solvent as mentioned in 6.3 may also be used.

7.4.1 Method of Removal

7.4.1.1 Washable fabrics — Sponge with dry solvent, apply dry spotter, and rub gently. Tamp gently with brush after adding more dry spotter. Flush with dry solvent. Dry. If stains remains, repeat above procedure. Dry. Apply amyl acetate and rub or blot. Keep moist with amylacetate for 15 minutes with occasional blotting. Flush with dry solvent. Dry.

7.4.1.2 Dry-cleanable fabrics — Same as for washable fabrics.

7.5 Group V — Tannin and Reducing Sugars, Some Vegetable Colouring Materials

7.5.0 The stains included in this group are as follows:

Bath oil	Home permanents	Tea
Beer	Molasses	Tobacco
Berry juice	Mouthwash	Toothpaste
Betal	Mud	
Caramelized sugar		Vegetables
Coffee		Vinegar (coloured)
Casein glue	Shaving cream	Whiskey
Cordials	Soft drinks	Wine
Cough syrup	Suntan lotion	
Fruit	Syrup	

7.5.1 Method of Removal

7.5.1.1 Washable fabrics — Soak in a water solution of detergent and vinegar. Rinse. Sponge with alcohol. Launder. If stain remains, soak in water solution of an enzyme product for 30 minutes. Rinse and launder.

7.5.1.2 Dry-cleanable fabrics — Sponge with water. Apply wet spotter and vinegar. Rub into stain. Rinse with water. Apply alcohol and rub into stain. Dry. If stains remain, apply an enzyme product for 30 minutes. Rinse with water. Dry.

7.6 Group VI -- Red Dyes, Deodorants, Perspiration, Urine

7.6.0 The stains included in this group are as follows:

Antiperspirants	Merthiolate
Candy	Metaphen
Deodorants	Paint, water colour

Dye: Clothing, food, hair
Inks, red
Mercurochrome

Perspiration
Picric acid
Urine

7.6.1 Method of Removal

7.6.1.1 Washable fabrics -- Soak for one hour in a water solution of detergent and ammonia. Rinse with water. Soak for one hour in a water solution of vinegar. Rinse and dry. Apply alcohol and rub gently. Rinse with water. Launder.

7.6.1.2 Dry-cleanable fabrics — Sponge with water. Apply wet spotter and ammonia. Blot stain with blotting paper. Keep area wet for 30 min with occasional rubbing. Rinse with water. Apply wet spotter and vinegar. Rub gently. Rinse and dry. Apply alcohol and rub gently. Rinse with water. Dry.

7.7 Group VII — Blue, Black, Green, Violet Dyes

7.7.0 The stains included in this group are as follows:

Blueing

Dye: Clothing, food, hair, shoe

Gentian violet

Ink: green, violet, blue, black

Paint: water colours

7.7.1 Method of Removal

7.7.1.1 Washable fabrics — Soak for 30 minutes in a water solution of a detergent and vinegar. Rinse with water and dry. Apply alcohol and rub gently. Dry. Soak for 30 minutes in a water solution of detergent and ammonia. Launder.

7.7.1.2 Dry-cleanable fabrics — Sponge with water. Apply wet spotter and vinegar. Blot with blotting paper. Keep area wet for 30 min and blot occasionally. Flush with water and dry. Apply alcohol and rub gently. Dry. Sponge with water. Apply wet spotter and ammonia. Keep area wet for 30 minutes and blot occasionally. Flush area with water. Dry.

7.8 Group VIII — Oxidising Oils, Rubber, Cement, Gum

7.8.0 The following stains are included in this group:

Stains

Asphalt

Butter

Solvents

Naphtha, gasoline

Carbon tetrachloride

Cement, rubber	Carbon tetrachloride
Chewing gum	Carbon tetrachloride
Corn oil	Carbon tetrachloride
Linseed oil	Carbon tetrachloride
Vegetable oil	Carbon tetrachloride

NOTE — Any other solvent as given in 6.3 may also be used.

7.8.1 Method of Removal

7.8.1.1 Washable fabrics — Apply dry solvent and dry spotter. Rub or tamp gently with brush. Keep area wet with dry solvent and dry spotter for 30 min with occasional rubbing. Rinse with dry solvent. Dry.

7.8.1.2 Dry-cleanable fabrics — same as for washable fabrics.

7.9 Group IX — Iodine, Penicillin, Silver Salts

7.9.0 This group includes the following stains:

- a) Silver albuminate (use enzyme product first),
- b) Iodine (do not use iodine in method of removal),
- c) Penicillin,
- d) Photodevelopment fluid, and
- e) Silver nitrate.

7.9.1 Method of Removal

7.9.1.1 Washable fabrics — Sponge area with water, and a few drops of iodine. Add a few drops of hypo solution and a few drops of ammonia. Flush well with water. Launder.

7.9.1.2 Dry-cleanable fabrics — Same as for washable fabrics, but do not launder.

7.10 Miscellaneous Stains

7.10.0 This group includes the following stains:

Acids	Flavouring extracts
Alkalis	Fly specks
Animal stains	Fly paper
Arnica	Grass
Awning drippings	
Black walnut	Hair dressing, hair tonic

Bronzing liquids	Ink, ball point pen
Candle wax	Lipstick
Chlorine	Meat juices
	Meat sauces
	Menstrual blood
Cologne	Mildew
Corrosion	Mustard
Embalming fluid	Pencil
Eye drops	Perfumes stains
Rust	
Scorch	
Shellac	
Shoe polish (white)	
Stamp-pad ink	
Turmeric	

7.10.1 *Methods of Removal*

7.10.1.1 *Acids:*

- a) *Washable fabrics* — Sponge with water, add ammonia, and let stand. Sponge and rinse well with water. Launder immediately.
- b) *Dry-cleanable fabrics* — same as for washable fabrics but do not launder.

7.10.1.2 *Alkalis:*

- a) *Washable fabrics* — Sponge with water, add vinegar, and let stand. Sponge and rinse well with water. Launder immediately.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics but do not launder.

7.10.1.3 *Animal stains* — These stains are made by household pets and are usually found on rugs, upholstery fabrics, and garments. Flush out the stain with water. Apply a few drops of 10 percent acetic acid solution. Flush out with water and dry. If stain remains, apply 3 percent hydrogen peroxide solution. Flush out with water and dry.

7.10.1.4 *Arnica (Source: antiseptic dressings)* — Sponge the stain with an alcohol and water mixture. Add a few drops of 10 percent acetic acid solution. Apply a soapless shampoo. Brush to loosen the stain. Flush out with alcohol-water mixture. Flush out with water and dry.

7.10.1.5 *Awning drippings* — These stains are caused by rains washing down such materials as soot, soil, rust, etc. Place an absorbent, such as starch, over the stain. Apply a soapless shampoo. If stain remains, apply a 3 percent hydrogen peroxide-sodium perborate solution. Flush out with water and dry.

7.10.1.6 *Black walnut* — The stains are composed largely of tannin.

- a) *Washable fabrics* — Sponge with water, apply wet spotter and vinegar. Brush gently. Repeat if necessary. If the stain does not disappear and the fabric permits, bleach with 3 percent hydrogen peroxide-sodium perborate solution, flush out with water. Feather out and dry. If fabric does not permit bleaching, launder it.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics but do not launder.

7.10.1.7 *Bronzing liquids (Source: bronze paint, Gold paint)* — Apply a paste of amyl acetate and starch. Loosen the stain with a brush. Flush out with naphtha or gasoline. Feather out and dry.

7.10.1.8 *Candle wax:*

- a) *Washable fabrics* — Remove excess with dull knife. Place stained area between blotting papers and iron. Replace blotters with fresh ones and iron until melting stops. Sponge with dry solvent (carbon tetrachloride).
- b) *Dry-cleanable fabrics* — Same as for washable fabrics.

7.10.1.9 *Chlorine:*

- a) *Washable fabrics* — Flush out the area with generous quantity of water and sponge with sodium bisulphite. Rinse with water and dry.
- b) *Dry-cleanable fabrics* — same as for washable fabrics.

7.10.1.10 *Cologne:*

- a) *Washable fabrics* — Sponge with water, apply wet spotter, and rub gently. Rinse with water. Apply alcohol and rub. Rinse with water. Launder.
- b) *Dry-cleanable fabrics* — same as for washable fabrics, but do not launder.

7.10.1.11 *Corrosion* — (It consists of a greenish stain due to brass or copper) — Apply a soapless shampoo and work into the stain with brush. Flush out with water and dry. If stain remains give rust removing treatment. Flush out with water and dry.

7.10.1.12 Embalming fluid (*Source: morgue stains, post mortem stains, dissection stains, autopsy stains, cadaver stains, morgue odor*) — Moisten the stain with water. Apply a paste of protein digestent and leave it for 30 min. Keep moist with warm water. Flush out with water and dry. If stain remains, apply a 3 percent hydrogen peroxide solution, if fabric permits. Flush out with water and dry.

7.10.1.13 Eye drops — Moisten the stain with water. Sponge with an alcohol-water mixture in equal proportion. Add several drops of 10 percent acetic acid solution. Loosen the stain with brush. Flush out with water and dry.

7.10.1.14 Flavouring extracts — Apply warm glycerine to the stain (50°C) and leave it for about 20 min. Loosen the stain with brush. Flush out with water and dry. To remove a persistent stain, apply an alcohol-water mixture. Add a few drops of 10 percent acetic acid solution. Flush out with water and dry. If stain remains, apply 3 percent hydrogen peroxide solution. Flush out with water and dry.

7.10.1.15 Fly specks — Moisten the stain with water. Apply a soapless shampoo. Add a few drops of 10 percent ammonia. Loosen the specks with brush. Flush out with water and dry.

7.10.1.16 Flypaper, sticky

- a) *Dry-cleanable fabrics* — Sponge the stain with naphtha or gasoline. Feather out and dry.
- b) *Washable fabrics* -- Wash in warm, soapy water. Rinse well and dry.

7.10.1.17 Grass:

- a) *Washable fabrics* — Sponge with dry solvent, rub gently. Dry. Apply amyl acetate and rub gently. Flush with dry solvent and dry. Sponge with water, apply wet spotter and vinegar. Rub gently. Rinse with water and dry. Sponge with alcohol. Rub gently. Dry. Bleach or launder if necessary. Or work with kerosene, sponge with dry solvent and bleach if required. Or wash in warm soapy water. Bleach if necessary.
- b) *Dry-cleanable fabrics* — same as for washable fabrics but do not launder.

7.10.1.18 Hair dressing, hair tonic — Moisten the stain with water. Apply a soapless shampoo, loosen the stain with a brush. Apply a few drops of 10 percent acetic acid solution. Flush with water and dry.

7.10.1.19 Ink, ball-point pen:

- a) *Washable fabrics* — Apply lukewarm (50°C) glycerine to stain, blot, and rub gently. Keep area wet with glycerine for 30 minutes with occasional blotting. Flush with water. Apply wet spotter and ammonia, tamp gently. Rinse with water. Dry. Apply amyl acetate to the stain. Flush out with naphtha. Dry.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics.

7.10.1.20 Lipstick (Contents: fats, oils, waxes and dyes):

- a) *Washable fabrics* — Apply dry solvent (naphtha), add dry spotter. Press area with clean blotter. Repeat until bleeding stops. If stain spreads, flush with dry solvent. Repeat until bleeding stops. Wash in warm, soapy water and dry. Sponge with water, apply wet spotter and ammonia. Rub gently. Flush with water, apply wet spotter and vinegar. Rub gently. Rinse with water and dry. Sponge with alcohol, if fabrics permits. Rub gently and dry.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics but do not launder.

7.10.1.21 Meat juices — Moisten the stain with water. Apply a soap solution concentrate. Add a few drops of 10 percent ammonia water. Work lightly with a brush. Flush out with water. If a stain persists apply a paste of protein digestant and leave it for 30 minutes. Keep moist with warm water and dry.

7.10.1.22 Meat sauces — Flush out the stain with water. Apply warm glycerine (50°C) and work it with a brush. Flush out with water. Apply a soapless shampoo. Apply a few drops of 10 percent acetic acid solution. Flush out with water and dry.

7.10.1.23 Menstrual blood — Flush out the stain with water. Apply a paste of protein digestant and leave it for 30 minutes. Keep moist with warm water. Flush out with water containing a little 10 percent ammonia. Flush out with water. Bleach with hydrogen peroxide — sodium perborate solution. Flush out with water thoroughly and dry.

7.10.1.24 Mildew:

- a) *Washable fabrics* — Wash the stains with soap and water. Bleach if fabric permits. Rinse out well and dry. Flush with dry solvent. Apply dry spotter, amylacetate, and brush gently. Flush well with dry solvent. Dry. Sponge with water. Apply wet spotter and vinegar. Rub gently. Flush with water. If stain remains, apply wet spotter and rub gently. Rinse and dry. If stain remains, apply alcohol and rub. Dry. Bleach if fabric permits.

- b) *Dry-cleanable fabrics* — same as for washable fabrics but do not launder.

7.10.1.25 Mustard:

- a) *Washable fabrics* — Carefully scrap off excess dried mustard. Flush with dry cleaning solvent. Tamp lightly with a brush. Flush with dry cleaning solvent. Allow to dry. Sponge with water and vinegar. Tamp lightly with brush. Flush with water. If any stain is left, wet the stain with hydrogen peroxide and add a drop of ammonia. Do not bleach longer than 15 minutes. Flush with water and dry. Or sponge with water. Rub glycerine into the stain. Soak in warm soapy water. Rinse well. Bleach in hydrogen peroxide. Rinse well and dry.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics but do not launder.

7.10.1.26 Indelible pencil:

- a) *Washable fabrics* — Erase excess with soft eraser. Flush with alcohol. Apply dry spotter and rub gently. Let it stand for 30 minutes. Flush with alcohol and dry. Sponge with warm, soapy water, apply wet spotter and ammonia. Rub gently. Rinse with water. Repeat if necessary.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics but do not launder.

7.10.1.27 Perfume stains — Same as for meat sauces.

7.10.1.28 Rust stains — Moisten the stain with water. Apply dilute oxalic acid/hydrochloric acid and leave for about 30 minutes. Work into the stain with brush. Flush out well with water and dry. Alternatively rub in paste made of table salt and 10 percent acetic acid and leave it for 30 minutes. Rinse well. Repeat this procedure if the stain persists.

7.10.1.29 Scorch — (It is an area of fabric or fibre charred or burned to some degree):

- a) *Washable fabrics* — Soap in soapy water. Wash and rinse well. If the stain persists, apply hydrogen peroxide-sodium perborate solution. Rinse out well and dry.
- b) *Dry-cleanable fabrics* — Brush the stain to remove the charred fibres. If the fabric permits, apply a 3 percent hydrogen peroxide solution. Flush out with water. Repeat, if necessary. Feather out and dry.

7.10.1.30 Shellac (A resinous substance dissolved in alcohol):

- a) *Washable fabrics* — Sponge with dry solvent, apply dry spotter and tamp gently. Repeat and dry. If fabric is other than cellulose acetate rayon, apply alcohol and tamp. Dry.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics.

7.10.1.31 Shoe polish, white (Contains waxes, resins):

- a) *Washable fabrics* — Sponge with dry solvent, add dry spotter, and brush. Rinse with dry solvent. Sponge with amylacetate and brush. Rinse with dry solvent and dry. Sponge with water, add wet spotter and vinegar. Brush gently. Rinse with water, dry and launder.
- b) *Dry-cleanable fabrics* — Same as for washable fabrics but do not launder.

7.10.1.32 Stamp-pad ink —Moisten the stain with glycerine and work with brush. Apply a soap-solution concentrate. Add a few drops of 10 percent ammonia water. Flush out with water and dry. If the stain remains, bleach with 3 percent hydrogen peroxide solution. Flush out with water and dry.

7.10.1.33 Turmeric — Same as for stamp pad ink.

8. REMOVING AN UNKNOWN STAIN

8.1 Washable Fabrics — Sponge with dry solvent. Apply dry spotter and rub gently. Flush with dry solvent. Apply amylacetate and rub gently. Flush with dry solvent. Dry. Sponge with water, apply wet spotter and vinegar and rub. Flush with water, apply wet spotter and ammonia. Rinse with water and dry. Sponge with alcohol and dry. Launder and bleach if safe for fabric and dry.

8.2 Dry-Cleanable Fabrics — Same as for washable fabrics but do not launder.

APPENDIX A

(Clause 7.0)

**READY REFERENCE BOX CHART FOR SPOT AND STAIN
REMOVAL IN CARE OF CLOTHING AND GARMENTS**

NOTE 1 — Do not use bleaching agent on dyed fabrics without testing as in 2.4.

NOTE 2 — For a bleach on animal fibres, use peroxide bleach.

NOTE 3 — For a bleach on vegetable fibres, any bleach may be used.

<i>Sl No.</i>	<i>Spot or Stain</i>	<i>Material</i>	<i>Treatment</i>
1.	Acid	Any	Sponge with water and ammonium hydroxide solution.
2.	Adhesive	Any	Sponge with carbon tetrachloride.
3.	Albumins	Cotton	Overnight soaking in 1 percent sodium silicate solution.
4.	Bituminous	Except acetate rayon	Dip in hot glycoethylether for 5 minutes.
5.	Blood	Wool and silk	Sponge with few drops of ammonium hydroxide in 3 percent hydrogen peroxide.
6.	Blood	Any	Sponge with enzyme preparation.
7.	Blood	Heavy goods	Use raw starch paste. Keep applying to spot until it disappears.
8.	Blueing	Any	Use detergent and 0.3 percent ether. Rub carefully.
9.	Butter	Rayon, silk and wool Other fibres	Sponge with carbon tetrachloride. Wash in warm water and soap.
10.	Candle wax	Any	Scrape off excess wax with knife and then sponge with carbon tetrachloride.
11.	Candy	Any	Sponge with water and soap solution.
12.	Chewing gum	Any	Rub with a piece of ice and remove hardened gum with knife. Sponge with carbon-tetrachloride and rub back of stain.

<i>Sl No.</i>	<i>Spot or Stain</i>	<i>Material</i>	<i>Treatment</i>
13.	Chocolate	Silk and wool Others	Sponge with hot water and soap and bleach if required. Soak in alcohol and ammonia.
14.	Cocoa		Same as in case of chocolate.
15.	Coffee	Wool Others	Soak in a solution of 1 part glycerine to 9 parts water by mass for one hour. Pour boiling soft water from a height of over 80 cm and soap if necessary.
16.	Coffee with cream	Cotton and others	Dry the material and sponge with carbon tetrachloride.
17.	Cream	Silk and wool Others	Sponge with carbon tetrachloride. Wash in soap and water.
18.	Egg	Any	Scrape off excess with knife and then sponge with water and soap.
19.	Fruits	Cotton Silk	Pour boiling water from a height or bleach with hydrogen peroxide. Sponge with alkali (ammonia) and alcohol mixed in equal proportion.
20.	Furniture polish	Any	Sponge with water and soap solution.
21.	Glue	Any	Sponge with soap solution.
22.	Graphite	Any	Sponge with dry spotting soap (2 parts oleic acid, 1 part each of chloroform, carbon tetrachloride, benzol, 1/5 part denatured alcohol, 1/12 parts ammonia).
23.	Grass	Silk and wool Others	Apply ammonia and cold water, wash in warm water and soap or bleach in hydrogen peroxide and ammonia. Wash in hot water and soap, or sponge with alcohol.

<i>Sl No.</i>	<i>Spot or Stain</i>	<i>Material</i>	<i>Treatment</i>
24.	Grease, oil	Any	Sponge with carbon tetrachloride on back side of the cloth.
25.	Gum	Any	Sponge with carbon tetrachloride on back side of the cloth.
26.	Hair oil	Any	Sponge and rub with dry spotting agent (1 part each of chloroform, benzol and carbon tetrachloride).
27.	Ice cream	Any	a) Sponge with water and soap and then bleach, or. b) Sponge with carbon tetrachloride.
28.	Indelible pencil	Any	Sponge with alcohol or soap solution.
29.	India ink	White goods	Sponge and rub the fresh stain with soap solution.
30.	Ink	Any	a) Sponge with water and soap and then bleach. b) Soak the fabric in lemon juice and salt or in sour milk.
31.	Iodine	Any	Sponge with denatured alcohol or sodium thiosulphate solution.
32.	Iron rust	Cotton, linen	a) Sponge with weak solution of oxalic acid and hydrochloric acid. Apply ammonia and rinse with water. b) Sprinkle salt, squeeze juice of lemon over it and lay in sunshine or hold steam from kettle.
33.	Lead pencil	Any	Try erasing. Sponge with carbon tetrachloride or use soap solution.
34.	Leather	Any	Sponge with soap and water.
35.	Linseed oil	Any	Sponge with carbon tetrachloride.
36.	Lipstick	Any	Use colourless grease such as petroleum jelly, or vaseline or glycerine. Rub and sponge with carbon tetrachloride.

<i>Sl No.</i>	<i>Spot or Stain</i>	<i>Material</i>	<i>Treatment</i>
37.	Medicine	Any	Sponge carefully with alcohol and then with soap solution.
38.	Mercuriochrome	Any	Sponge with soap solution, bleach and rinse with water.
39.	Metallic stains	Any	Sponge carefully with acetic acid and rinse well.
40.	Mildew	Silk and wool	Sponge with lukewarm water and dry. Then sponge with carbon tetrachloride.
		Others	Soap, wash well and bleach.
41.	Milk	Any	Sponge with soap solution.
42.	Mud	Any	Allow to dry, brush, sponge from back with soap solution or carbon tetrachloride. Rinse.
43.	Mustard	Any	Sponge with glycerine (50°C). Apply water and then 20 percent acetic acid and then sponge with water. Bleach and sponge again with water.
44.	Nail polish	Acetate rayon	Sponge with amylacetate or banana oil.
		Others	Sponge with ethyl acetate.
45.	Nail varnish	Except acetate rayon	Sponge with acetone.
46.	Old paint/oiled varnish	Any	Sponge vigorously with care with equal parts of alcohol and benzene or use turpentine oil.
47.	Paint	Any	Sponge vigorously with care with turpentine oil or benzene or kerosene.
48.	Pencil marks	Any	Try erasing. Sponge with soap and water.
49.	Perspiration	Any	Use soap and water. Bleach if required.
50.	Salad dressing	Any	Sponge with carbon tetrachloride.

<i>Sl No.</i>	<i>Spot or Stain</i>	<i>Material</i>	<i>Treatment</i>
51.	Scorch	Any	Sponge with soap solution and bleach.
52.	Shellac	Any	Sponge with alcohol or benzene.
53.	Shoe polish	Silk and wool Others	Sponge with carbon tetrachloride. Wash in soap and water.
54.	Sugar	Any	Sponge with hot water.
55.	Tar, road oil, creosote oil	Any	Sponge with carbon tetrachloride.
56.	Tea	Any	Sponge with soap solution or pour boiling water.
57.	Tin foil	Any	Sponge with soap and water.
58.	Tobacco	Any	Sponge with hot water and soap.
59.	Tomato	Any	Sponge with soap solution.
60.	Varnish	Any	Sponge with alcohol or benzene.
61.	Vaseline	Any	Sponge with carbon tetrachloride.
62.	Water colours	Any	Sponge with soap solution.
63.	Wax	Any	Sponge with carbon tetrachloride.
64.	White sauces	Any	Sponge with soap and water.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²