

**“STUDIES ON THE VARIOUS TYPES OF
SHOE UPPER AND SOLE FINISHING BASED
ON THE INTERNATIONAL MARKET
REQUIREMENT”**

DEDICATED TO-----

MY BELOVED PARENTS

Whose eternal love and affection inspired me at every walk of life.

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Md Abdullah Al Mamun

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ABSTRACT

Shoe finishing of the last operation of shoe making which is done to make the shoe presentable and attractive to the customer. It helps to achieving softer and more natural appearance of shoe.

Many defects which are seen during various manufacturing process is remove by proper finishing. So shoe finishing is an important factor.

Shoe finishing is a multi-process activity where a number of operations are performed in a sequential manner on fabricated shoe to provide aesthetic perfection and a kind handle. In early days, shoe finishing refers to bottom finishing i.e. finishing of sole and heel etc. Actually finishing is carried out in both bottom and upper for value addition to the shoe, to make it resistant to external factor (rubbing, scuffing etc). It is also carried out to repair and camouflage any minor damage caused during construction, to modify and adopt the appearance of shoe with regard to gloss, color, feel or any special effect to suite customer requirements and ultimately to increase its aesthetic and intrinsic value as a commodity. The aesthetic sensual and practical attributes of shoe give it a high quality image in the eyes of the discerning customer. The finishing process varies from material to material, construction to construction and many other factor like machineries, production facilities etc. To be a successful shoe finisher one should have deep knowledge about the type upper and shoe finishing, the property and nature of shoe finishing chemicals and their compatibility with the previous leather finish and finally the method of shoe finishing.

AIM OF MY PROJECT WORK

One of the important objectives of shoe finishing is to "delight the customer" and there are two important opportunities to impress the customer in the retail shop and foreign buyer for export.

1. First there is the visual impact. At this moment of first customer contact, the appearance of the shoe should create a positive feeling in the potential purchaser's mind. The brand should be prominent and the cleanliness, shape and surface finish should create a good impression.
2. Then the second opportunity when the shoe is tried on. This is where the comfort element plays an important part in clinching the sale.

In this project paper I want to focus how to improve the appearance of the shoe by applying shoe finishing material.

So I am inspired to work on shoe finishing for good covering, smooth, natural and aesthetic feel to impress the customer and foreign buyer for export shoe according to international market demand.

The aim of this project work is to give the necessary knowledge about shoe finishing.

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Chapter 1

INTRODUCTION OF FOOTWEAR

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CHAPTER ONE

INTRODUCTION OF FOOTWEAR

1.1 DEFINATION OF FOOTWEAR:

Any foot covering in the form of shoes boots slippers or hose used for dress wear. Not necessarily synonymous with shoes which are simply are category of footwear.

In English the term "Shoe" dates backs to many centuries beginning with the Anglo-Saxon "Sceo" meaning a foot covering and evolving into "Schewis" then "SCOOY" and finally "Shoe".

1.2 THE PURPOSE OF SHOES:

- ✓ To protect the sole of the foot.
- ✓ To protect the upper part of the foot.
- ✓ To support the foot (sprain, civilized foot).
- ✓ To give cushioning the step (walking on pavement, jogging etc.)
- ✓ To assist the foot to perform some abnormal task.
- ✓ To overcome abnormalities in the foot itself.
- ✓ To meet the critical and specific requirements for special purpose.
- ✓ To protect the foot from pollutants and contaminants.
- ✓ To protect the foot from dirt and moisture, acid, alkali, chemicals etc.
- ✓ To give satisfaction and comfort, durability and reliability to the user.
- ✓ To protect the foot against injury while working, standing or working etc.
- ✓ To provide special functions for sports.
- ✓ To protect the foot against the cold and/ frostbite.
- ✓ To give outfit, stylish appearance and fashion context.
- ✓ To complete a costume.
- ✓ To indicate rank or office.

1.3 THE HISTORY OF SHOE:

This low cut, instep-laced style originated at Oxford, England, in 1640 and is the youngest of the eight basic styles. But its real popularity began when it was in 1740 the Oxford did not appear in the United States until 1898.

The Oxford was designed to serve as a kind of foot corset. This reduced the spread of the foot making it appear smaller and trimmer just as a corset created the illusion of a small youthful waist and hips.

Up until the early 17th century, most shoes used straps or buckles as fasteners. In fact, Birmingham, England, was the world center of shoe buckles exclusively. In 1640 a radical new style, a low black shoe with laced fronts, was maws adopted by the students of Oxford University. The style spread rapidly and the Birmingham shoe buckle industry was devastated, despite pleas to the king to prohibit the new-laced shoes. Late in the country, Thomas Jefferson was one of the first Americans to wear Oxford. His peers for succumbing two the foppish French Fashion" chided him, while rawhide cords and ribbons had been used as shoe fasteners many centuries earlier, shoe lacings wand the Oxford style, as we know it today did not appear until the middle of the 17th century. Shoe lacing were later to become a small industry. In the latter part of the century on Englishman, Harvey Kennedym, made a fortune of \$2.5 million after he patented and introduced the anget the metal tip at the end of the lacing to make it easier to lace, the shoe. In same century John Bunyan, when he was a prisoner for his controversial view kept his family from starving by hand fixing metal lips to the shoe laces.

TYPES OF FOOTWEAR:

Derby:



Picture: derby shoe.

Most commonly used formal and casual shoes:

- ✓ A very wide range of styles can be derived from a derby design.
- ✓ Unisex.

Can be identified from the following points:

- ✓ Lock stitch or stay stitch.
- ✓ The quarter can be opened till half of the tread line.
- ✓ The vamp and tongue will be on the same ling.
- ✓ In most of the cases quarter will be on the vamp.

Oxford:



Picture: Oxford shoe.

Most widely used as formal shoes.

- ✓ Unisex.
- ✓ Quarter is locked at the vamp point and hence opening of the quarter is limited.
- ✓ Has an independent tongue which is stitched at the final stage of the upper.
- ✓ In most of the case vamp will be on the quarter.
- ✓ A popular unisex footwear which is very comfortable

Sandals:



Picture: Sandal.

- ✓ The foot is free at the toe and heel.
- ✓ The sandals serves according to the specific needs as the length can be adjusted with the help buckle.

Court shoe:



Picture: Court shoe.

- ✓ Shoes for ladies formal and casual wear.
- ✓ The top line will be below the vamp point.
- ✓ Can be made in different heel heights.

Slip on:



Picture: Slip on.

- ✓ Slip on is also as pantafola and loafer.
- ✓ As the name indicates these shoes can be slipped in and out very easily.
- ✓ Does not have lace.
- ✓ Can be with or without elastic.
- ✓ Saddle is present in most of these designs.

Boot:



Picture: Boot.

- ✓ Casual shoes popular among kids and teenagers.
- ✓ Different types of boots are ankle boot, High boot, Knee boot and thigh boot.

Moccasin:



Picture: Moccasin.

- ✓ The most comfortable shoe to wear.
- ✓ Expensive as more leather is consumed.
- ✓ Formal and casual shoe.
- ✓ Bottom will be covered with upper leather at the fore part. V Hand stitching gives a good appearance.

The classification of shoe (on the basis of various shoes):

As to wearer:

- ✓ Men's
- ✓ Women's
- ✓ Children's

As to adjustment:

- ✓ Lace
- ✓ Elasticized
- ✓ Button or buckle (fastened).

Varieties of work shoes

- ✓ Clog
- ✓ Farm
- ✓ Cowboy boot
- ✓ Mining
- ✓ River drying
- ✓ Wood soles
- ✓ Riding boot.
- ✓ Industrial shoe.

As merchandise:

- ✓ Staples
- ✓ Standard styles Fashions Novelty Specialty Casual or play

Sub-classification:

- ✓ Growing girls shoes
- ✓ Boys
- ✓ Youths
- ✓ Little boys
- ✓ Infants

As to purpose:

- ✓ Dress
- ✓ Business
- ✓ Afternoon
- ✓ Evening
- ✓ House
- ✓ Sports
- ✓ Work

- ✓ Casual Play
- ✓ Occasional
- ✓ Platforms
- ✓ Open toes
- ✓ Open back

As to cut:

- ✓ Bal
- ✓ Stretchable or elasticated.
- ✓ Oxford Bootee
- ✓ Step in (slip-on)
- ✓ Tie Pump
- ✓ Moccasin Sandal

1.4 SHOE UPPER:

Generally leather and synthetic material is used as shoe upper. But leather is the mostly used shoe upper material. Maximum fashionable and comfortable shoe are manufacture where leather is used as upper material.

1.5 SHOE UPPER LEATHER:

The leather used for making of upper components of shoe is known as shoe upper leather. Most of the shoe upper leathers are chrome tanned leather. Combination tanning is carried out with a combination of chrome, vegetable, synthetic or other tanning agents to improve the fullness and firmness and some other desire properties of shoe upper. The main combinations are semi-chrome and chrome-retanned leather. Leather is first tanned with vegetable and then retanned with chrome tanning agent is semi chrome retanned leather. Chrome retanned leather is softer and flexible and mostly used as shoe uppers.

1.6 TYPES OF SHOE UPPER LEATHER:

GRAIN LEATHER:

SL no	Types	Raw stocks	Thickness mm	Tanned	Properties
1	Full Grain Leather	Full grain means the original grain surface should be exposed without snuffing.			
2	Side upper leather	Cattle hides (all classes)	1.2-1.8 mm	Chromed tanned	Good fullness, no loose grain.
3	Box sides	Cattle hides (15-25 kg)	1.4-2.2 mm	Purely Chromed tanned	Full handle with firm structure.
4	Corrected grain leather	Cattle hides (all classes)	1.2-2.0 mm	Vegetable/synthetic/ additional resin tanning	Give an artificial grain layer by impregnation and thicker, filling finish coat.
5	Waterproof leather	Cattle hides (medium weight classes)	1.8-2.4 mm	Chrome Vegetable tanned/Chrome tanned	Full, slightly rubber like handle with tight and smooth grain.
6	Russet upper	Cattle hides &	1.8-2.8 mm	Natural-colored, vegetable tanned	Softness, fullness,

	leather (heavy footwear such as hiking and mountainig boots, army boots, industrial shoes)	Kips (15 kg and more)		side upper leather.	pliability, sufficient firmness, little washing out loss, good tensile strength, good air permeability etc.
7	Russian leather (shoe and boot upper, harness and fancy leather)	Light cattle hides and calf skin.	1.4-2.6 mm	Combined vegetable tanned and chrome tanned	To achieve the characteristics smell, it is impregnated with birch-tar oil.
8	Polishing leather	Cattle Hides (all classes)	1.2-1.8 mm	chrome tanned, have slightly vegetably /synthetically retanned and have received a polishing finish	Soft, similar to aniline, with a light/dark contrast when the grain is extended.
9	Sandal leather	Cattle Hides (all classes)	1.6-3.0 mm	Vegetably tanned with reduced fat liquoring.	Mostly used unlined, the fleshed side is processed with short fibers by dry shaving or buffing.
10.	Box calf	calf skins	0.8-1.4 mm	chrome tanned, glaze or	Full, supple handle with

		(all classes)		glaze/plate finish	good firmness and good tensile strength.
11	Calf upper leather	calfskins (all classes)	0.8-1.8 mm	Chrome/ Vegetable tanned.	Good firmness and good tensile strength.
12	glazed kid leather (highest quality and most elegant leathers, used mainly for ladies footwear)	Kid skins and light goat skins of good substance (4 sqft.)	0.6-0.9 mm	Formerly two-bath today one-bath chrome tanning method, with smooth glaze finish.	Firm grain, no poor substance, no elasticity in all sides and flanks, high gloss, non-coating finish.
13.	Goat skin upper leather	Goat skins of all breeds and sizes.	0.6-1.4 mm	chrome tanned /chrome-vegetable tanned.	Have all degree of softness and all variations of finish.
14.	Chevettes (imitation of glazed kid leather)	Lamb and sheep skins of good substances	0.6-1.0 mm	Strongly vegetable retanned.	Have lower strength properties and a different appearance of

		from special raw stocks.			grain.
15.	leather of reptiles	Smaller types of crocodiles, lizards, snakes.	0.3-1.2 mm	particularly attractive pigment patterns are received by alum tanning	Dyed and finish with colorless glaze top coats. Are only processed to a small extent for highly fashionable shoes and trimmings.
16.	Horse and foal upper leather	Horse hides (12 kg and more), foal hides (7-12 kg salt weight)	1.0-1.6 mm	more intensive opening up of the skin by stronger liming	Glazed horse upper leather, horse side leather
17.	Pig upper leather	Pig skins (2-4kgs)	0.8-1.4 mm	vegetable /synthetic/ additional resin tanning and Grain burring.	Good water repellent and good waterproofness properties.
18.	Kangaroo upper	Clear grain Kangaroo	0.8-1.2 mm	chrome/	Maximum strength

	leather	skins		Vegetable tanned / Synthetic tanning.	properties and used for hard wearing footwear.
19.	Patent leather	Cattle hide, calf skins or goat skins	1.0-2.0 mm	Cold lacquering processes with P.U. lacquers, less frequently by lamination.	Leathers with a mirror bright gloss and with a relatively thick finish coat. Good adhesion, Good cracking resistance.
20.	Shrunken grain leather	Cattle hide, calf skins or goat skins	1.0-2.2 mm	chrome/ Vegetable tanned. / Astringent Synthetic tanning agents/ glutaraldehyde.	Have a grain shrinking effects.
21.	leather of fish skins	some types of seal, shark, dolphin, several types of cod, Pollack		Avoid excessive decomposition of albumen substance, short soaking and liming at below 20°C.	The strength properties are insufficient in types offish skins.

		and eel etc.			
22.	Split upper leather	Flesh side lower splits of firm texture made from cow hides.	0.8-2.2 mm	Vegetable / Syn- thetic retannage.	Smooth short- fibre nap, good filling. Good adhesion.

SUEDE AND NUBACK LEATHER;

Sl no	Types	Raw stocks	Thickness mm	Tanned	Properties
1.	Suede upper leather	cow, horse hides, pig, calf, goat and sheep skins etc.	0.6-0.8 mm	Chrome tanned, aluminum, zirconium, glutaraldehyde, resin retanned and buffed on flesh side.	Even, rough or velvety fibre quality on the flesh or split side. Short and firm nap, shower proofness, softness, non- stretchiness and good color.

2.	Split suede leather	from lower Splits	0.8-1.0 mm	same as suede upper leather	same as suede upper leather
3.	Nubuck leather	cow, horse hides, pig, goat and skins etc.	0.7-0.9 mm	Chrome tanned, aluminum, zirconium, glutaraldehyde, resin retanned and buffed on grain side.	A very fine velvety plush character is achieved on the grain side. Exceptional softness and non-stretchiness and good color

1.7 PROPERTIES OF SHOE UPPER LEATHER:

- ✓ The physical appearance of finished leather should look attractive with clear grain.
- ✓ The leather must possess a soft and mellow 'handle' with fine and tight 'break' on the grain which will not crack in the lasting room of the shoe manufacture.
- ✓ The leather must possess high strength properties i.e. tensile strength, stitch tear strength, split tear strength, tongue tear strength, elongation at break etc.
- ✓ The leather must possess the hygienic property of being permeable to water vapor and air.
- ✓ The must be stable against repeated tensile and compressive strains and bending.
- ✓ The leather should have high scuff resistance.
- ✓ The must be stable against repeated flexing.
- ✓ The finish on the leather should have high adhesion and must be durable against wet and dry rubbing.
- ✓ The leather should have high fastness properties i.e. color fastness, rub

fastness, fastness to acid, alkali and perspiration, light fastness etc.

- ✓ The leather should have high bursting strength and grain crack resistance.
- ✓ The leather must be light weight and give foot comfort to the users.
- ✓ The leather must be resistance to cracking, shrinking, peeling or curling.

1.8 THE MAIN REQUIREMENTS OF IDEAL UPPER LEATHER:

➤ AESTHETIC APPEAL:

The leather should have elegant attractive appearance. Elegant appearance requires that the grain surface must be distinguishable from that of a leather substitute and colors, gloss and grain appearance should be attractive and appeal to the buyers of footwear. The leather should retain the color, should not stain wearer's clothes and should have ability to take polish. Not only looks but also the feel of the leather by touch in the shoe are important.

➤ PHYSICAL PROPERTIES:

The most important requirements for shoe upper are long term flex performance (wet, dry and cold), good adhesion (wet and dry), rub fastness and high temperature performance during plating, hot air drying and lasting. Strength and stretch of upper materials used in shoe making are good guides for their suitability. Low strength and stretch of upper leather and consider unsuitable for use as shoe uppers.

The important physical properties of upper leather which determine its suitability use in shoe making are:

1. Tensile strength.
2. Stitch tear strength
3. Split tear strength
4. Elongation at break
5. Distension at grain crack

6. Bond strength
7. Per cent set
8. Reaction of the finish to two dimensional stretch and
9. Resistance of upper to heat and pressure.

➤ **CHEMICAL PROPERTIES:** Chrome content, fat content, ash content etc.

➤ **COMFORT PROPERTIES AND DURABILITY:**

Flexing endurance, Water vapor permeability, Perspiration resistance, Scuff resistance etc.

➤ **COMMERCIAL CONSIDERATIONS:**

The upper leather must possess "good cutting value" with least wastage and require the minimum of re-finishing prior to the packaging of the footwear. It should also be inexpensive.

1.9 THE BASIC REQUIREMENTS OF UPPER LEATHER:

- ✓ It must give safety and comfort to the users.
- ✓ It should contribute to the efficient shoe performance.
- ✓ It must contribute to the hygiene and comfort of the foot.
- ✓ It must meet the arithmetic requirements of fashion and style.
- ✓ It must be economical and easily workable and repairable in the shoe making process.
- ✓ It should possess adequate wear resistance.
- ✓ It must not pinch or squeeze the foot.
- ✓ It must not irritate the skin of the foot.
- ✓ The colorant used in the upper material must not rub off onto the sock or foot.
- ✓ The optical appearance and shape of the upper should be unchanged by wear.

Chapter 2

LEATHER FINISHING

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CHAPTER TWO

LEATHER FINISHING

2.1 LEATHER FINISHING AND FINISHES:

The last and most important operation in a tannery today is finishing where the leather surface is coated with nice looking, colored or colorless, flexible, stretchy, durable film of some film forming materials so that it can attract customers, can protect the leather underneath from all respects and can give comfort to the users. Finishes on leather also serve as a protecting coating.

Most of the leather after tanning, retanning, dyeing and fat liquoring and drying require final finishing. Leather finishing is based on the application of one or more coats of finishing composition or seasons over the surface of leather. The leathers after the application of such season may be allow to dry out, but is often followed by glazing or plating, ironing or polishing. The leather may also be given a pattern by embossing or printing.

Finishing of leather is an extensive and complex technology. Finishing of leather involves application technology based on certain scientific principles, and stimulation of personal creativity aided with sensitive appreciation of art. Thus leather finishing can be linked to a crafts man's work, of real artistic application.

Application part of the technology consists of manual or mechanical operation during which film forming / binding agents are applied on leather surface aiming to improve appearance feel, grain character, and surface protection to aesthetics modes and creative fashion.

2.2 OBJECTS OF LEATHER FINISHING:

- ✓ Changing the color to that, which is required?
- ✓ Levelness of color on the leather.
- ✓ Uniformity of shade from leather to leather and pack to pack.
- ✓ Adding a transparent film through which the natural appearance of the leather may be viewed.

- ✓ Imparting color or pattern to un-dyed leather.
- ✓ Giving a surface to the leather varying from matt to gloss.
- ✓ Alter the surface of the material is split.
- ✓ Adding a transparent colored film to the leather.
- ✓ Covering the leather with an opaque film in order to obliterate all defects.
- ✓ By filling the surface of loose leather improve the break of the grain.
- ✓ Improve the scuff resistance of the leather.
- ✓ Improve the water resistance of the leather, i.e. the finish should not discolor or swell and hence protect the leather and retain, its good appearance.
- ✓ Render the leather light fastness.
- ✓ Give leather of optimum cutting value.
- ✓ Seal the leather surface so that it remains clean.
- ✓ Render the leather fast to acids.
- ✓ Render the leather resistant to a light pull up on lasting.
- ✓ Render the leather heat fastness.
- ✓ Render the leather fast to alkali.

2.3 FINISHING QUALITIES:

- ✓ Not spoil the feel of handle of the leather.
- ✓ Remain in its original condition of gloss or matt for a long period.
- ✓ The finish should not craze or be easily removed.
- ✓ It must adhere to the leather in damp or wet conditions.
- ✓ Not make a film on the leather, which is too plastic like appearance.
- ✓ It should be resistant to the adhesives used in the manufacture of leather goods.
- ✓ Have resistance to cold crack.
- ✓ It should resist dry cleaning fluids.
- ✓ Resist heats and not crack.
- ✓ The finish should not take—up color from articles or impart color to it will be concluded that a leather do not require all the above properties and it must be stressed that all the above properties cannot be achieve by the use of one finish only.
- ✓ Be water vapor permeable.
- ✓ Allow the leather to be washed.

The number of coats of finish applied to a leather and the way in which they are applied is very important sometimes more important than the actual constituents of the finish. Most leather should be dyed slightly darker than that they are intended to be finished.

2.4 FEATURES OF FINISH FILM THAT IMPROVE THE SHOE QUALITY:

1. FLEXIBILITY AND STRETCHINESS:

Leather is a flexible material with certain degree of stretchiness. If the film to the leather surface does not possess these properties to the same extent as leather, it will make the leather hard and the film will crack in course of time.

2. ADHESION:

The film should be firmly fixed to the leather surface so that the former does not come out during use.

3. HOLDING POWER:

The film should have sufficient capacity to hold in its other sub-stances like pigment, plasticizers etc. during drying or film formation no ingredient of the finish should precipitate out. The ideal film will never allow the plasticizers to migrate into the leather.

4. GLOSS:

The film should glaze by itself or should acquire this quality after glazing under glazing machine or hot plating or brushing.

5. ABRASIVE RESISTANCE AND FASTNESS:

The film should have sufficient resistance to abrasion for longer life and at the same time, it should hold the coloring materials so tightly that it does not come out when rubbed with a dry or wet cloth.

6. WATER PROOFNESS AND WATERVAPOUR PERMEABILITY:

The film should repel water so that the leather under it does not come in contact with water but at the same time, it should allow water vapor to pass through.

7. THICKNESS:

The film should be as thin as possible so that it does not spoil the leathery appearances of the finished leather at all but at the same time, the film should hide all defects in the leather.

8. RESISTANCE TO ACID, ALKALI AND CHEMICALS:

During use, the leather comes in contact with dirt, mud, acid and alkaline fumes sweat etc. The film on the leather should have therefore, sufficient capacity to protect the leather from these.

2.5 CLASSIFICATION OF LEATHER FINISHING:

In many cases, two or more names may exist for the same finish when classified according to finishing techniques, finishing materials and finishing effects:

A. Classification according to the finishing technique:

- ✓ Glaze finish.
- ✓ Plate finish.
- ✓ Glaze/ plate finish.
- ✓ Corrected grain finish.
- ✓ Embossed finish.
- ✓ Spray finish.
- ✓ Curtain coating finish.
- ✓ Spray finish.
- ✓ Roll coating finish.
- ✓ Film transfer finish.

B. Classification according to the finishing effect:

- ✓ Aniline finish.
- ✓ Semi-aniline finish.
- ✓ Opaque finish.
- ✓ Easy care finish.
- ✓ Two or multi tone finish.

- ✓ Brush off finish.
- ✓ Antique finish.
- ✓ Fancy finishes.
- ✓ Invisible finish.
- ✓ Craquele finish.
- ✓ Padding finish.
- ✓ Foam finish.
- ✓ Solvent free or solvent poor finish.

C. Classification according to the finishing materials used:

- ✓ Casein finish
- ✓ Polymer or binder finish
- ✓ Nitro cellulose or colloidion finish
- ✓ Cellulose ester finish free from nitro groups
- ✓ Polyurethane finish
- ✓ Patent finish.

2.6 THE STRUCTURE OF FINISES:

The finish consists basically of three coats:

Base coat — Pigment coat - Top coat.

All coats are not absolutely necessary- their application depends on the type of leather to be produced. It is possible to choose intermediate stages or to apply the top coat on its own. Basically softer products are chosen for the bottom layers and harder and more resistant products for the final coat.

EXAMPLE

Aniline Leather	Semi-aniline Leather	Corrected grain leather
	Top coat	Top coat
Topcoat	Transparent pigment coat	Covering pigment coat
Aniline dyeing	light color base coat	Grain impregnation and base coat

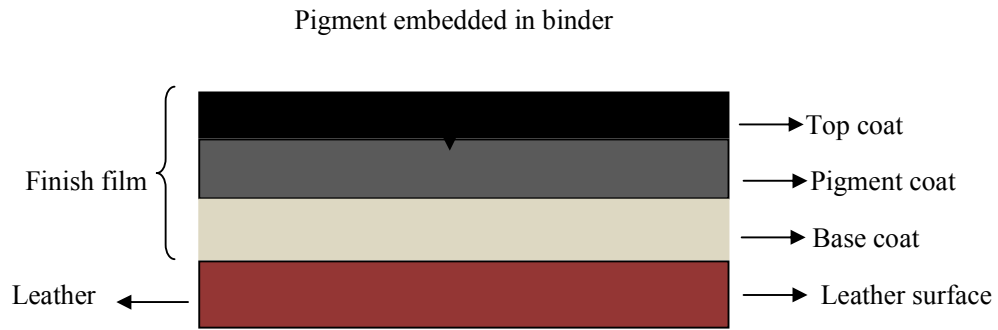
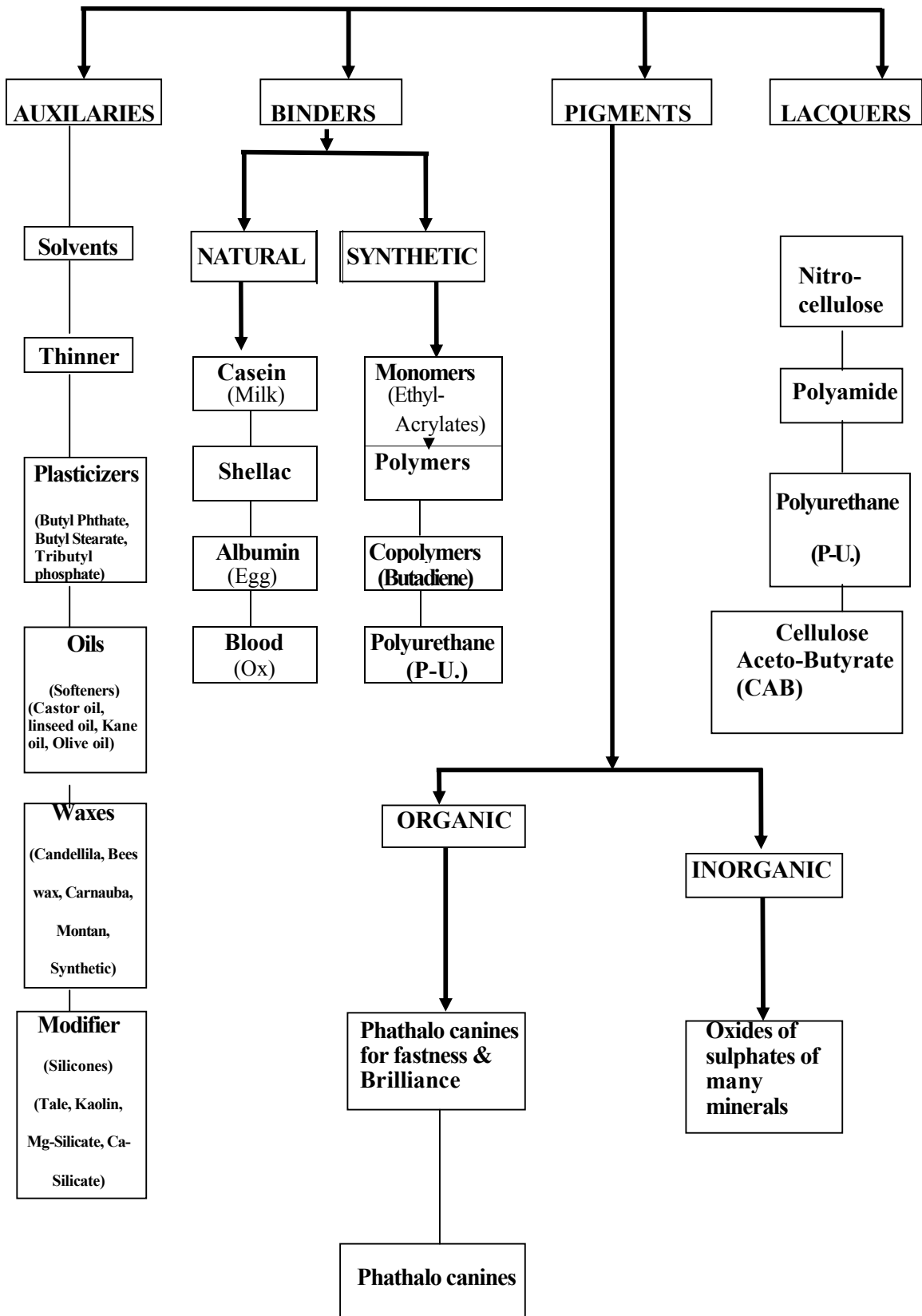


Fig: Different layers of finish film on leather.

2.7 FINISHING CHEMICALS AND THEIR AUXILIARIES:

- ✓ Pigment.
- ✓ Dyes.
- ✓ Waxes.
- ✓ Protein binder.
- ✓ Resin binder.
- ✓ Polyurethane.
- ✓ Penetrator.
- ✓ Matting agents.
- ✓ Handle modifier.
- ✓ Gloss giving materials / NC.
- ✓ Fillers.
- ✓ Solvent.
- ✓ Plasticizer.
- ✓ Leveling agent.
- ✓ Cross-linker.
- ✓ Thickener.

2.8 LEATHER FINISHING CHEMICALS AT A GLANCE



2.9 TYPES OF LEATHER FINISHES:

There are three different types of leather finishes which are commonly used by leather finishes. They are:

1). Water type finishes:

These may be based on pigments, protein binders, such as casein shellac, gelatin egg and blood albumin waxes and mucilaginous substances like decoction of linseeds. These finishes are mainly used for glazing or softness. Recently water type finishes based on pigments or dyes and resin dispersions are increasingly used to achieve special effects on the finished leather. The use of such finishes has produced many improvements over the conventional protein based finishes such as better adhesion and -legibility of the finish improved filling and sealing properties and greater uniformity of the finish.

2). Solvent type finishes:

Solvent based finishes contain as a binder either polyurethane or colloidion cotton (nitro- cellulose). These finishes are dissolved in organic solvents such as butyl acetate cyclo - hexagon etc These finishes are widely used for finishing upholstery leather, bag leather case leather and certain military leathers where low temperature flexibility is necessary.

3). Emulsion type finishes:

Emulsion type finishes consist of emulsions of nitro cellulose or resins. Such emulsions are being widely used to confer combining properties of water and lacquer finish. Lacquer emulsion top coats for upper garment and glove leather are gaining wide acceptance. In leather finishing the three types of finishes mentioned above can either be used alone one or in combination with one another. The choice depends on the specific effects desired on the finished leather.

2.10 APPLICATION OF FINISHES:

The final look and qualities of finished leathers largely depend upon how the finish was applied on the leather surfaces. Finishes are applied on leathers by these methods:

a) Pad coating / padding: The chief method for application of base coating

floats is done manually with a sponge, a folded cloth cleaning wool or cotton wool covered with a permeable cloth. The pad is first dipped into a lacquer or dye solution and then lightly wiped over the raised parts. This serves to achieve two color effects and high gloss or mat effects.

b) Spraying / spray coating: It is the most common method and is applied by means of compressed air. It is suitable for applying aqueous and solvent containing finishing floats. This is done by means of manual spraying guns in spraying cabling with exhausters or by means of automatic spraying guns on continuous spraying belts.

c) Curtain coating: The curtain coating float is poured onto the leather being fed through a lost in the heard or by means of an overflow system. The unspent float flows back into the supply tank and is continuously re-circulated. To ensure an even flow of the curtain it is important that the float be free from foam bubbles and possess adequate viscosity so that does not break off abruptly due to air whirls or trapped air. It should be ensured that drying takes place in an absolutely dust free environments.

Chapter 3

SHOE FINISHING

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CHAPTER THREE

SHOE FINISHING

3.1 DEFINITION:

The upper leather received from leather industry to make footwear may well fulfill all the requirements. But during shoe production the leather has to pass through various physical and mechanical operations (Which are sometimes quite abrasive and stretchful) and it will have an accumulation of factory dirt and damages, resulting in a comparatively battered appearance. After completing all those fabricating operations, the upper could possible loss its gloss, original security and sometimes even its inherent characteristics which has to be recovered. The process of recovering and enhancement of all those properties of upper leather is known as shoe finishing.

3.2 OBJECTIVES OF THE SHOE FINISHING:

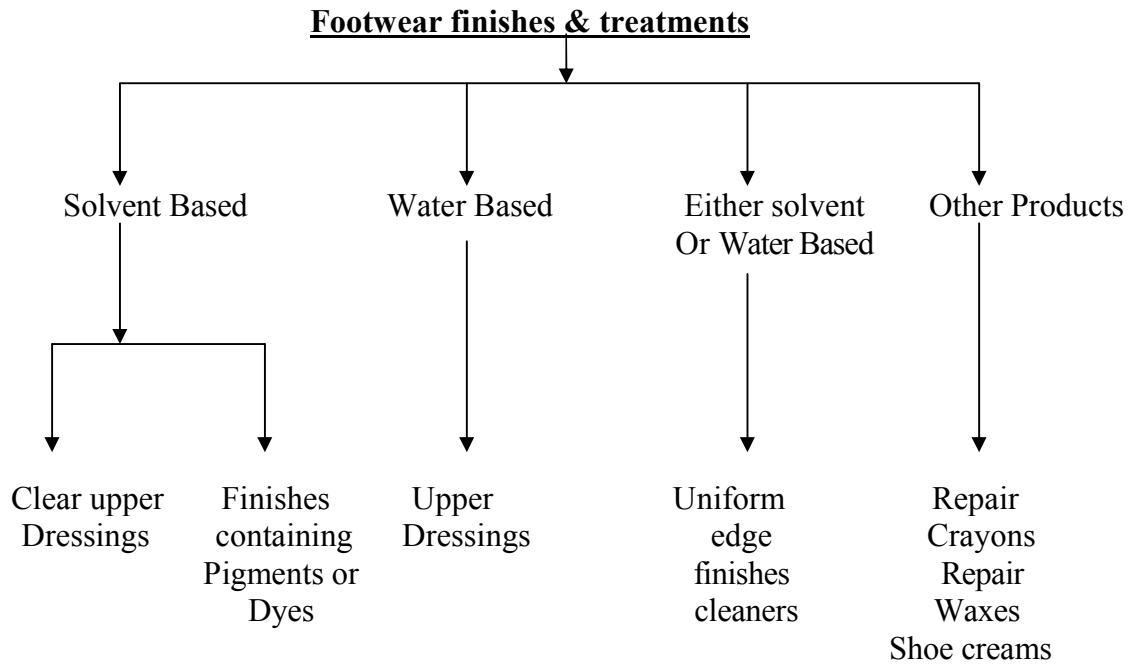
Shoe finishing is the final operation performed on footwear after constructional work has been completed. It is done to fulfill the following objectives:

- ✓ To ensure that footwear has the best possible appearance at the point of sale.
- ✓ To repair minor damages caused during manufacture.
- ✓ To remove general soiling, stitch marks wrinkles and loose thread ends.

3.3 FINISHES ON LEATHER:

To be able to achieve the objectives of shoe finishing, a shoe room supervisor must have a thorough knowledge of upper materials and particularly of their finishes, to enable him to select the appropriate shoe room system. Following tables may help a shoe room supervisor to identify the basic finish types, to select the right dressing system and to avoid problems of incompatibility between the leather finish and the dressing.

3.4 TYPES OF SHOE FINISHES:



Those tree gives an indication about the products which are available, but in general, finishes are either:

Solvent Based

Or

Water Based.

Both of these are special types of 'Paint'. They have some common features:

- ✓ They both 'dry' by the evaporation of a liquid.
- ✓ When dry they must be satisfactory in appearance and abrasion resistance.

➤ **Solvent Based:**

Solvent based finishers contain two main ingredients:

- I. The liquid (a solvent)
 - ✓ It is an organic chemical liquid.
 - ✓ At normal factory temperature, it evaporates in a few minutes.

II. The solid (dissolved in liquid)

- ✓ This is left behind as a thin film, appropriately one thousandth of an inch thick or less.
- ✓ The film contains the colored pigments or dyes, when they are used. The solid part or, the film forming part of the finish is generally a resin substance.

Each of the resins are used to give the finish some particular property: Gloss
Flexibility Toughness etc.

➤ **Water Based:**

It has also two main ingredients:

I. The liquid (Water)

- ✓ It evaporates at room temperature,

III. The solid:

- ✓ This is left behind as a thin film.

3.5 MATERIALS REQUIRED AND METHODS OF USE:

Material	Method
Dilute (20%) ammonia solution	Dampen a soft white cloth, rub the leather finish firmly and note if color has transferred to pad. When leather is dry, note effect on finish.
Acetone MEK is a suitable alternative	Dampen a soft white cloth, rub lightly and note if color has transferred. Rub again with a fresh area of cloth and note any further change.
Copper wire or strip and gas flame (Brillstein Test).	Burn the copper in the gas flame until free from green flame. Touch the leather finish lightly and immediately return to flame. Green flame color

3.6 MATERIAL USED IN SHOE FINISHING:

Kenda Farben Italy Shoe Finishing Chemicals

CLEANER:

- ✓ **Function:** Concentrated cleaner for leather uppers.
- ✓ **Shelf life:** about 24 months if stored in well closed original packing in a dry and airy place.

CLEANER SUPPER:

- ✓ **Function:** Solvent base, degreasing dresser for types of leather and synthetic material for uppers. It removes the adhesive residuals.
- ✓ **Shelf life:** about 12 months if stored in well closed original packing in a dry and airy place.

APPRETTO SUPPER:

- ✓ **Function:** Water base finish. "Universal" Type, Highly Glossy, Suited for all type of full and corrected grain casein, aniline and nitre tanned leathers.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

APPRETTO MILD:

- ✓ **Function:** Water base finish. "Universal" Type, suited for all type of full and corrected grain casein, aniline and nitre tanned leathers. It gives a bright and gloss effect to the shoes.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

SIRIO:

- ✓ **Function:** High glossy, self-shining, finishing paste cream, for leathers.

- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

SETA:

- ✓ **Function:** Finishing cream for leathers having natural glossy effect and a silky touch.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

SIRIO:

- ✓ **Function:** Base coat in cream for leathers, coloring, equalizing and covering the leather defects before the final application of the finishes.
- ✓ **Shelf life:** about 24 months if stored in well closed original packing in a dry and airy place.

SIRIO:

- ✓ **Function:** Finishing cream for leathers having a full glossy effect suitable for open grain leathers.
- ✓ **Shelf life:** about 24 months if stored in well closed original packing in a dry and airy place.

ABRASIVE, POLISHING SOLID WAXES:

- ✓ **Function:** Abrasive was for smoothing with cotton brush: leather soles bottom, heels and edges.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

ANTIQUA:

- ✓ **Function:** Finishing cream for leather having natural waxy effect excellent coverage of the open grain.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing's in a dry and airy place.

LYS:

- ✓ **Function:** Cream re-newer for which leathers.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

BRAVOPELL:

- ✓ **Function:** Softener for footwear.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

FEDOR:

- ✓ **Function:** Varnish for PVC.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place.

DIAMANTE E:

- ✓ **Function:** Emulsion of waxes and valuable resins for the finishing of smoothed leather soles bottom.
- ✓ **Shelf life:** About 24 months if stored in well closed original packing in a dry and airy place. Keep from freezing and extreme heat.

3.7 IDENTIFYING FINISHES:

Effect of dilute	Effect of acetone	Copper metal test	Finish type	Class of leather having such finish
Color	No effect	No green	Prote	Aniline calf box
no or negligible effect on	Color readily removed. Base coat may be	No green color	Resin	Resin semi-aniline Rub off, persisted, Finished split
no effect	No effect	No green color	Polyurethane	Patent scuff resistant, water,
no effect	Slight tackiness	Strong green	PVC	Patent coated split
Negligible	Negligible	No green	Wax/ oil	Burnish able oily



Picture-1



Picture-2

Chapter 4

FINISHING PROCESS (UPPER LEATHER)

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CHAPTER FOUR

FINISHING PROCESS (UPPER LEATHER)

4.1 THE MAIN OPERATIONS OF SHOE FINISHING:

1. Cleaning.
2. Repairing.
3. Wrinkle chasing.
4. Filling by base coating.
5. Top dressing.
6. Cutting and polishing.

4.2 CLEANING:

The surface to be finished must be clean before surface coating. It is necessary not only to remove the dirt, adhesive, over spill and other unwanted marks and contamination but also to condition the finish surface to accept dressings and/or other treatments.

4.2.1 PRINCIPLES TO FOLLOW WHEN CLEANING:

Relate the choice of cleaner and the method of cleaning to the type of contamination that is being removed and the type of finish on the upper.

For example solvent based cleanness should be used to soften natural rubber. But do not try to remove rubber solution from suede with a solvent based cleaner or "tide marks" will result suede has to be dry cleaned.

Use dry methods in preference to wet.

Use the mildest treatment possible that will effectively remove the contamination. The stronger the cleaner, the more finish it will remove in cleaning. If uncertain what cleaners to use, always start with the mildest, and try progressively stronger cleaners until the dirt is removed. The effect on finishes can be tried on cuttings of the name material obtained from clicking room.

4.3 CLEANING METHODS:

The methods of clean are two types. They are:

- ✓ Dry.
- ✓ Wet Both can be done by hand or machine. The choice of cleaner and method of cleaning depends on the type of finish on the upper.

➤ Dry cleaning by hand:

Dry cleaning is primarily used on suede finishes, which must on no account be cleaned with liquids. It also to be employed on all types of fabrics as liquids leave "Tide marks" Dry cleaning by hand is done with the following different tools to serve various distinct purposes.

✓ Brushes and scouring pads:

Are ideal for removing general dust and dirt and for brushing up the nap.

✓ Power dove tail brush:

To remove dust from between the sole edge and upper leather edge. Also used to remove stitch marks from the upper.

✓ Crepe rubber/resin rubber:

To remove adhesives from upper and lining.

✓ Soft sponge rubber:

To brush and refresh the suede nap/ nubuck nap.

✓ Blunt knife:

To scrap away hard substance and to remove wax and thermoplastic hot melt adhesives. It could be used on suede and nubuck leather.

✓ **Emery paper:**

To remove adhesive from suede and nubuck, if the adhesive is not penetrated too deep. It is also used for raising and even up any suede nap that has been badly treated or discolored.

✓ **Brass wire/stiff bristle brush:**

To remove general dust and loose foreign substance from suede and nubuck leather .Brushing is done lightly in one direction (preferably from front to back) to give same nap.

➤ **Dry cleaning by machine:**

This method is the same as the 'wet' method (as described below) accept that all brushes are used dry. Using the brushes dry on the mactame requires a hard finish which will stand up to friction and the heat generated. The operation needs skill to use just sufficient pressure to remove dirt without damaging the finish. Actually, hand method is used only to remove some stubborn contamination.

➤ **Wet cleaning by hand:**

In this case, cleaners are applied by cloth (White neck-pieces are best) wrapped round fingers rubbing gently over that surface, or by sponge when very little rubbing pressure is required. Stubborn dirt may need extra rubbing or application of more suitable cleaner, cloths should be renewed frequently, and sponges regularly washer.

The attraction of hand cleaning is that selective cleaners can be used and each shoe can be given individual and each shoe can be given individual treatment.

➤ **Wet cleaning by machine:**

The machine has only one applicator for cleaner and usually a mild water based type is chosen for general cleaning, care should be taken not over brush and damage the finish. Any stubborn areas may have to be cleaned by hand to avoid

damage. The amount of cleaner applied to the brush should be adjusted to 'Wet out' the material without being excessive.

The method of cleaning on the machine is

- a) The feather area is cleaned with small well cleaning brush.
- b) The upper is cleaned with the bigger brush.
- c) The upper is dried on the cloth mop.
(Polishing is done on the bristu brush.)

4.4 TYPES OF LIQUID CLEANERS:

Cleaning wet is carried out with any of the following types of cleaners:

Water based: These are usually very mild types of cleaners and contain soaps, wetting, dispersing and emulsifying agents and sometimes weak alkalis such as ammonia dissolved or suspended in water.

These cleaners are mild enough to use for machine cleaning.

- ✓ These are suitable for over all removal of the general grime and dirt. Example: CL404 (stall), CL435 (Stahl), CL577 (Stahl) etc.

Water/solvent based: Cleaners of this type are made from solvents which mix with water such as methylated spirit and acetone.

- ✓ These cleaners are suitable for overall cleaning of certain finishes that are unaffected by these solvents such as PU coated fabrics patents.
- ✓ They have a big advantage over water based in that they dry much quicker.

Solvent based: The solvents in this type are usually derived from petroleum, and can be mixed with other solvents of the same type to give different cleaning powers.

- ✓ These are suitable for removing grease, oils and waxes and weaker blends can be used for removal for overall cleaning of certain finishes.
- ✓ They are very quick in drying,
Example: CL309(stahl) ,CL519(shahl), CL510(steal)

Cleaner/polishes: These are supplied as gels and contain solvent cleaners and polishing agents, which remain on the surface after the solvents have been evaporated. Application is by sponge or cloth and after drying can be polished on a power mop.

- ✓ Suitable for patents and PU coated fabrics
- ✓ Have the advantage of giving an acceptable semi-bright finish without having to spray.

Example: CL529

4.5 CONDITIONS:

Conditioners are water based, and are designed to open up the surface for efficient cleaning. The cleaners described above can be again classified as following as follows:

Type	Action	Formulation
Water-based (for hand or m/c application)	Mild	A natural cleaner contain Detergent /soap.
	Medium	May contain ammonia
	Strong	May contain ammonia or solvent(e.g. alcohol)

Solvent (For hand application)	Mild	Light petroleum spirit eg. ligroin
	Medium Strong	Petroleum spirit containing Chlorinated solvents. Alcohol based spirit.
	Strong	Solvents capable of dissolving resin finishes
Cleaner Conditioners (for hand application)	Medium cleans and 'fills' in one operation	Contain small amount of resin to 'fill' and may contain some

4.6 SELECTION OF CLEANING SOLVENTS IN COMMON USE:

Solvent	Other Names	Dissolves	Remarks
Toluene	Tolucol	Rubber, oils, fats, resin and waxes	Very flammable, toxic fumes.
Petroleum Naphtha a. Petroleum ether b. Ligroin c. White spirit	Benzene petrol gasoline Light benzene, Light petroleum Middle Benzene	Ditto	Too flammable and volatile for general use. Very flammable & volatile

Carbon tetra Chloride	'Thaw pit' CTC	Rubber, oils, fats, resins.	Non flammable toxic Fume particularly With lighted cigarettes.
Trichloroethylene	Wastrel	ditto	As above, but more Powerful very poisonous.

Methylated Spirit	Ethyl alcohol	Resins, spirit dyes, sewing waxes	Flammable, mixes with water
Autone		Resins, fats some waxes acetate rayon	Very flammable party mix with water.
Methylethyl ketone	M. E. K		Flammableless Volatile than acetone mix with water
Anylacetate	Banana oil	ditto	Flammableless Volatile than acetone peardrop small.

4.7 REPAIRING:

During footwear manufacturing, uppers may be damaged as a result of

- ✓ Over roughening along the feather line.
- ✓ Scuffing of the finish during handling
- ✓ Damage to the finish by solvents and heat.
- ✓ Grain crack during lasting, shade variation of upper may increase. In order to overcome these damages repairing is needed on shoe upper actually it is done to bring the shoe to a good standard before continuing with the other operation in the finishing. Using minimum amount of repair pastes, spray paints, renovators, or uniformers on upper materials repairing can be done to achieve the desired effect.

To achieve the better performance correct materials should be used. For this reason a shoe room supervisor should have necessary knowledge about the repairs. Here criteria of some wide used repairs are described.

➤ REPAIR CRAYONS:

From: Stick, discs

Type: Wax based in very soft (lipstick), medium and hard forms, color.

Method of Application: Soft crayons can be rubbed on. Hard crayons melted on with warm knife

Special features:

- ✓ Gap filling will not shrink. Used for heavy damage.
- ✓ Not suitable for flexible areas.
- ✓ Dry instantly on cooling.
- ✓ Resin sprays may not stick to repaired areas.

➤ REPAIR PASTE:

From: Thick paste

Type: Colored resin emulsions (matched if needed)

Method of application: Brush or knife

Special features:

- ✓ Not gap filing.
- ✓ For light damage.
- ✓ Can be matched
- ✓ Not suitable for flexible areas.
- ✓ Dry in 5-20 minutes.

➤ **UNIFORMERS, RENOVATORS:**

From : Solution or emulsion

Type: pigment, solvent or water borne

Method of application: Spray or Brush

Special features:

- ✓ To even shade of uppers.
- ✓ Solvent borne dry fast.
- ✓ Can be matched.
- ✓ Some water based give a degree of feel.

➤ **ANTIQUING PRODUCT:**

From: Solution

Type: Solution - Resin/ dry in Solvent.

Cream - colored, water borne

Ink - Resin/ dry in Solvent.

Method of application:

Solution - Spray

Cream - Brush, sponge or cloth

Ink - Brush or cloth.

Special features:

- ✓ Solution - Fast drying for resin finished
- ✓ Cream - For coloring wax edges. Excess should be wiped off
- ✓ resin spray may mat stick.
- ✓ Ink - For coloring wax edges, wiped of excess immediately.

4.8 WRINKLE CHASING:

This operation is done to remove wrinkles from the upper by hot air and steam and by ironing steaming.

Principles of wrinkle chasing:

- ✓ This operation is best done before cleaning.
- ✓ It is done with the shoe with last, so that the upper takes up the shape.
- ✓ The air is very hot (about 300 c) so care should be taken while doing this operation, Otherwise, over heating can cause burn to the upper.

➤ **FILLING BY BASE COAT:**

Filling or base coat application is done to fill and the uppers that have developed an open or hungry look after lasting.

Points about base coat or fillers:

- ✓ They act as a base coat for subsequent top dressings.
- ✓ They are usually available in black leather and are colorless for other leather colors.
- ✓ They are nearly always applied by hand using sponge
- ✓ They should dry out streak free.

Types of base coat or filler:

Three types of filler are used in shoe marking finishing and they are used according to degree of fill:

Types	Usage
Light	For light leather finishes e.g. protein
Medium	For resin finished leather
Heavy	For leathers with 'open' or hungry look.

➤ **TOP DRESSING:**

This operation is the final and most important treatment. Which gives the shoe its luster and determines its final appearance.

Success of top dressing:

The success of top dressing rest son:

- ✓ Correct and thorough cleaning.
- ✓ Compatibility of the dressing the material finishes.
- ✓ Condition of the upper before spraying.
- ✓ Correct application.
- ✓ Correct spray gun adjustment.

➤ **TYPES OF DRESSING AND APPLICATION:**

A. Water based:

- ✓ Water based dressings are used only on leather and are not so durable as solvent based.
- ✓ They are mainly wax emulsions, or blends of wax with resins. They are usually colorless.
- Application: Usually by spray.

B. Solvent based:

- ✓ Solvent based dressings from Strong coatings, which are compatible with a wide range of upper materials.
- ✓ They are fast drying and are based on cellulose derivatives acrylics or polyurethane. They can be clear or colored.
- Application : by spray.

C. Creams, polishes and waxes:

- ✓ These are non-film forming and can only impart a semi-gloss to the material. However they tend to improve the feel and handle of materials.
- ✓ Silicones have been introduced in creams for patents to prevent it sticking to itself as can occur in the shoe box.
- **Application:** by sponge or cloth allowed to dry and then brushed on a power

driver cloth. Further hard work (carnauba) can be applied at this stage by power mop and finally polished on a bristle brush.

D. Clear/polishes:

- ✓ These are supplied as gels or creams and contain solvent cleaners and polishing agents which remain on the surface after solvents have evaporated.
- ✓ These are very suitable for patents and pu coated fabrics.
- ✓ Application by sponge or cloth. After drying it can be polished on a power mop.

➤ **SELECTING A DRESSING SYSTEM FOR LEATHER:**

Before selecting a system the shoe room supervisor should know:

- ✓ The type of finish on the leather.
- ✓ The final requirement of the upper in terms of gloss and handle.
- ✓ The range of commercially available shoe room products, a If the production is new it is essential to try a range of suitable shoe room systems and select the most appropriate.

It is not advisable to develop a shoe room system using products from different findings suppliers. Top dressing from the same supplier can usually be inter mixed if they are of same type in order to obtain the correct degree of luster.



Picture-3



Picture-4

Chapter 5

SHOE POLISHES

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CHAPTER FIVE

SHOE POLISH

SHOE POLISHES AND CREAMS:

5.1 POLISHES:

There are two main reasons for shoe finishes and dressing. The first one is to present to the public with a well finished appearance and there is no doubt that smart, attractive finishing enhances the quality of the footwear. Secondly final dressing of shoes should mask and cover up any small, superficial defects. Apart from this shoe finishes should impart greater durability and increased wear resistance to the shoes, for instance to render greater waterproofness to heels and edges.

Polishes are concentrated mixtures consisting of a blend of waxes, solvents, oils and coloring agents.

➤ WAXES:

The function of the wax is to provide a hydrophobic protective film, which can be polished by friction. The types of waxes employed include carnauba wax, candelilla wax, paraffin wax, montan wax and silicone waxes; economic considerations bear heavily on the choice of wax.

➤ SOLVENTS:

Solvents are used initially to render the waxes soluble and after application of the polish, evaporate, leaving a film of wax on the leather surface. The solvents will also remove grease etc. from the leather, giving the product a cleansing function. Thus polishes must always be stored in closed containers. The solvents employed are of the hydrocarbon type and include white spirit and related solvents.

➤ COLOURING AGENTS:

Polishes are colored with dyestuffs and pigment.

➤ **OILS:**

Oils are present in small amounts to act as plasticizers and to feed the leather. They act also as solvents for oil soluble coloring agents.

5.2 CREAMS:

These are aqueous emulsion of waxes, solvents, oils and coloring materials. They contain emulsifying agents and may be weakly alkaline in reaction. Thus care should be taken when using them to ensure that the grain surface of the leather is not harmfully disturbed.

5.3 WAXES:

These are esters of aliphatic fatty acids with alcohols other than glycerol, i.e., higher fatty alcohols (monohydric alcohols).

5.4 CLASSIFICATION OF WAXES:

These are animal, vegetable mineral and synthetic waxes, depending upon the source. Animal waxes are secreted as protective coatings by certain insects vegetable waxes are found as coatings on leaves, stems, flowers and seeds. Mineral waxes are paraffin waxes obtained from petroleum and such waxes as are yielded by coal, peat and lignite.

✓ **CARNAUBA WAX:** This wax is obtained from the carnauba palm, which grows in Brazil. The leaves are cut, dried for 3 days and sent to beater house. The drying loosens the wax which can be easily belated from the slashed leaf and it falls to the floor where it is gathered at end of the day and melted. Less than 1L of molten wax is filtered through cheesecloth, allowed to harden and sold. A palm tree produces about 90 g of wax per year.

M.P: 84°C. Uses: Polishes, carbon paper, printing ink.

✓ **SPERMACE TI:** It is a solid animal wax obtained as a crystalline solid from the head cavities of the sperm whale. Crude spermaceti is light yellow in color and contains mainly the cetye palnitite, but refined from is a white translucent solid, insoluble in water. It is almost odorless, very brittle and can be readily powdered.

✓ **PARAFFIN WAX:** These are mineral waxes derived from petroleum. They are

saturated and unsaponifiable hydrocarbons. Paraffins are the cheapest waxes.

MP: 50-60°C. Uses: Candles, Polishes, Cosmetics.

✓ **BEES WAX:** This is probably the best known wax. It is made from honeycombs by solvent extraction, expression or boiling in water. The honey combs of the bees are melted and the liquid is strained to remove solid matters. It is then solidified in moulds by cooling. The crude yellow Wax thus formed is refined to white wax by bleaching (either by air or by oxidizing agents such as Hydrogen peroxide and chromic acid). The crude yellow wax is used in leather dressing, candles, polishes, etc.

✓ **OROCERITE:** It is the name given to certain naturally occurring mineral waxes. The hard wax is available in a range of colors verifying from green to white, with melting points of 66-78°C. Orocerite wax is composed mainly of Saturated and unsaponifiable hydrocarbons. Uses: As paraffin (candles, polishes, cosmetics)

✓ **MOUNTAIN WAX:** The name mountain wax generally applies to the wax obtained from a bituminous wax, solvent-extracted from bituminous lignite or shale but a similar wax may be obtained from peat or brown coal.

MP: 75°C. Uses: Polishes, Carbon paper, insulating.

✓ **CANDELILLA WAX:** It is a vegetable wax harder than bees wax, but not so hard or brittle as carnauba wax. Crude wax is brown in color and may be refined to get light yellow colored wax.

MP: 68°C. Uses: Polishes, Candles.

✓ **SYNTHETIC WAX:** Various materials are used to make synthetic waxes. Carbo waxes are high molecular weight polyethylene glycols.

5.5 WAX POLISHES:

The wax polish consists of semi-solids, being solution or dispersions of wax in suitable solvent such as turpentine and/or white spirit, and colored to the required shade. Shoe polishes of this type in various grades can be obtained using a variety of waxes. For a bright polish a large portion of high polishing wax such as carnauba or candelilla is essential, together with a smaller proportion of paraffin or ozokerite type

waxes. For black polishes considerable quantity of the naturally occurring black colored montan wax may be used. The following formulae represent typical examples of black and brown boot polishes:

Brown Boot Polish

- ✓ Carnauba wax → 5 parts by weight
- ✓ Paraffin wax → 22 parts by weight
- ✓ Bees wax → 6 parts by weight
- ✓ Turpentine → 50 parts by weight
- ✓ White spirit → 50 parts by weight
- ✓ Oil soluble brown dye → 0.2 parts by weight

Black Boot Polish

- ✓ Carnauba wax → 8 parts by weight
- ✓ Ozokerite wax → 3 parts by weight
- ✓ Paraffin wax → 6 parts by weight
- ✓ Montan wax → 8 parts by weight
- ✓ Bees wax → 2 parts by weight
- ✓ Oil soluble black dye (Nigrosine) → 3 parts by weight
- ✓ Turpentine → 100 parts by weight

5.6 WAX EMULSIONS:

Wax is emulsified with water to produce oil in water dispersion and this may be of a thin, creamy nature and can be sold in the shoe trade as fakes, glosses and polishing pastes. It has the advantage over wax polish as -

- ✓ Ease of spreading and evenness of film formation
- ✓ Greater penetration and better keeping qualities

The latter being the slower rate of evaporation of water compare to organic solvents.

DISADVANTAGES:

- ✓ It has got lower degree of luster in the final polish and the resulting film being little tacky.
- ✓ The polish may be less water resistant.

The reading water dispersible nature of Carnauba wax made it suitable for this application.

A TYPICAL COMPOSITION IS GIVEN BELOW:

- ✓ Carnauba wax 13%
- ✓ Oleic Acid 2%
- ✓ Triethanolamine 2%
- ✓ Water 83%

Instead of oleic acid, long chain carboxylic acid, ester or salts such as 3-hydroxy-1, 3, 4- pentad cane tricarboxylic acid also are used.

5.7 OTHER SHOE POLISHES:

The improvement in luster and water repellent properties and increased solvent retaining capacity of paraffin wax was obtained by addition of phenol formaldehyde resin and non-oxidized polyethylene wax or high melting synthetic casein. Acid casein gritted with 4-6 parts of vinyl acetate monomer was modified as shoe polishing material. Polyethylene wax mixed with paraffin wax also finds application as shoe polish. Addition of polyethylene siloxane and other siloxanes increases the water resistance of these shoe polishes. Antarctic polypropylene, a byproduct of isotactic polypropylene, can be used in place of paraffin wax in making shoe polishes.

A TYPICAL COMPOSITION IS GIVEN BELOW:

- | | |
|---------------------------|-----------|
| ✓ Polyethylene | 8-15 % |
| ✓ Paraffin wax | 20-30 % |
| ✓ Butanol | 0.8-1.0% |
| ✓ Steric acid | 0.8-1.0% |
| ✓ White and/or Turpentine | 53-70.4 % |

In all shoe polish formulations 0.05-0.07% of sodium pentachlorophenate is added as a fungicide. The shoe polish composition that does not require wax to provide a high luster with better water resistance than wax based polishes can be made in the following composition.

✓ Polymethyl methacrylate	20 parts
✓ Butyl cellulose	8 parts
✓ Diacetone alcohol	1 parts
✓ Water	71 parts

1,2 polybutadiene in an organic solvent such as cyclohexane and xylene containing gasoline and silicone oil can also be used as a shoe polishing material poly(2-hydroxy ethyl methacrylate) either alone or copolymer of poly (2-hydroxy ethyl methacrylate with butyl methacrylate) in the ratio of 80:20 can also be used as a shoe polish.

Chapter 6

DRESSING AND APPLICATION

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CHAPTER SIX

DRESSING AND APPLICATION

6.1 DEFINITION:

Of all the finishes or coatings used on upper materials, those present on leather are the most varied. The ideal Shoe Room 'treatment for one leather may be disastrous for another.

Some simple tests are available to help Shoe Room supervisors identify the basic finish types, select the right dressing system and avoid problems of incompatibility between the leather finish and the dressing.

TOP DRESSING

This is the last dressing applied to the shoe upper before boxing. It p the final feel and the required gloss or luster and may be applied by spray, sponge, brush or mop.

Type	Base	General properties
Water-borne spray	Wax, Wax and Shellac, Acrylic resin, Nitrocellulose, Polyurethane	Nonflammable, slow drying. Some may contain solvent.
Solvent- borne spray	Nitrocellulose,	Flammable, fast drying, water resistant, film forming miscible with metallic or perished finished.
Water-borne creams	Wax with resins or Silicone	Non-Film forming: Often dry-) right.
Polishing wax	Hard wax	Good gloss developed mopping or brushing, Non-film forming.

6.2 DRESSING: TYPES AND APPLICATION

This operation is the final and most important treatment, which gives the shoe its luster and determines its final appearance.

The operation is known by various other names depending on the way it is applied:-Top dressing, Spraying, Top spraying.

The success of this operation rests on: Correct and thorough cleaning, compatibility of the dressing with the material, finish, condition of the upper before spraying, correct application, correct spray gun adjustment and technique.

TYPES OF DRESSINGS & APPLICATION

✓ WATER BASED:

Water based dressings are used only on leather, and are not as durable as solvent based types. They are mainly wax emulsions, or blends of wax with resins. They are usually colorless.

Application: Usually by spray

✓ SOLVENT BASED:

Solvent based dressings form strong coatings, which are compatible with a wide range of upper materials. They are fast drying and are based on cellulose derivatives, acrylics or polyurethane. They can be clear or colored, are available in a wide range of luster from matt to high gloss.

Application: by spray

✓ CREAMS, POLISHES AND WAXES:

These are non-film forming and can only impart a semi gloss to the material. However, they do tend to improve the feel and "handle" of materials. Silicones have been introduced in creams for patents to prevent it sticking to itself as can happen in the shoe box.

Application: by sponge or cloth, allowed to dry and then brushed on a power driven cloth mop. Further hard waxes (carnauba) can be applied at this stage by power mop, and finally polished on a bristle brush. Spraying is not necessary.

✓ **CLEANER/POLISHES:**

These are supplied as gels or creams and contain solvent cleaners, and polishing agents, which remain F on the surface after the solvents have evaporated. These are very -suitable for patents and PU coated fabrics, and have the advantage of giving an acceptable semi-bright finish without having to spray.

Application: by sponge or cloth. After drying it can be polished on a power mop.

6.3 SPRAY GUN ADJUSTMENT:

On most spray guns for top spraying, the following adjustments are available:

✓ **MATERIAL FLOW:**

Usually a screw adjustment which controls the amount of liquid being sprayed when the trigger is fully depressed.

✓ **SPRAY PATTERN:**

On some guns the shape of the spray-pattern can be altered between round and oval. "Pear drop" and "banana" shapes are incorrect and are likely to lead to uneven coverage.

✓ **SPRAY PATTERN POSITION:**

This is important on oval spray patterns, which should be vertical.

✓ **AIR PRESSURE:**

Note that air pressure is not controlled on the gun, but usually on an air transformer somewhere close by.

6.4 SPRAYING TECHNIQUE:

A technique should be developed to obtain an overall even coat of the dressing, without Streaks, runs, misted or rough finish. The following are some factors that are important:-

✓ CHECK SPRAY PATTERN:

The spray pattern should be checked by momentarily spraying on a piece of waste material such as cardboard held square to the gun. Uneven patterns are usually due to obstructions or damage at the fluid tip.

✓ CHECK AIR PRESSURE TO THE GUN:

This should be 2.8-3.5 bar (40-50 psi).

✓ HOLDING THE SHOE:

For shoes, it is best to put the hand inside. The hand is used to present the shoe at the correct angle (not to move it past the gun). The hand will protect the inside of the shoe from over A glove should be worn for protection. On boots, the hand can be put inside the leg.

Some operatives hold the top of the heel, but there is danger of leaving marks on successive shoes from the accumulation of over-spray on the thumb and fingers. The shielding effect of finger and thumb to the over-spray can also leave noticeable areas on the side of the heel.

✓ ATTITUDE TO, AND DISTANCE FROM THE SHOE:

The nozzle of the gun should be kept square to the upper surface and at a distance of 30 cm (12) at all times. The fluid flow should be adjusted to give sufficient dressing to "wet out" without causing runs.

✓ SPRAYING THE SHOE:

Various methods are practiced, and the best seems to start at the toe, move along the feather, up the back seam, along the top-line, over the instep, along the other side top-line, down the back seam, along the feather to the toe, and up the centre of the vamp to the top of the quarters.

The gun must be moved with one hand, whilst the other presents the shoe in the right attitude. The spray should be started and finished just off the shoe, and must be kept moving at a constant speed over the surface.

✓ **DRYING:**

Once spraying is completed, very great care must be taken to avoid touching the wet surface, or allow anything to come into contact with it until it is thoroughly dry.

6.5 FAULTS WHICH OCCUR IN SPRAYING:

TYPE OF FAULT	POSSIBLE CAUSE
Mist or fog	Dressing is too thin. Air pressure too high. Gun held too far away.
Uneven finish (orange peel effect)	Poor cleaning. Wrong air pressure. Wrong gun distance. Wrong thinners used (if diluted in factory) Contaminated dressing. Air hose contamination (disturbing applied dressing)
Rough finish	Insufficient fluid feed. Gun too far away. Too high a spraying pressure
Streaks	Uneven spray pattern. Gun not square to surface.
Runs or snags	Dressing too thin. Too much dressing applied. Gun not square to work. Working too slowly over the surface
Splatter on starting	Air valve activator wrongly adjusted. Broken needle spring. Foreign body in fluid tip
Air Leakage from gun	Dirty valve seat. Worn valve seat. Broken spring. Lack of lubrication on valve stem.
Fluid leakage	Worn or damaged fluid tip or needle. Dirty fluid tip. Wrong size needle.

THE TREATMENT OF LEATHER UPPER:

LEATHER FINISH	CLEANING	FILLING	REPAIRING	DRESSING
RESIN	Solvent or water based cleaners. May be hand or machine cleaned.	Water & Solvent based fillers available	Use wax crayons or pigment pastes for scratches and scuffs. If only the finish is damaged use uniforms or renovators.	Solvent and water based are suitable. If finish is filled water based dressings are best. Creams are also available.
ANILINE	Mild water based cleaners,	Not usually necessary but special fillers are available if required.	Can be very difficult, Special aniline repair sticks are available.	Water based keep dressing quantity to a minimum. Wax emulsion, ion polishes may be applied by hand or brush.
PATENT PVC	Solvent based special cleaner polishes available.	Not necessary	Solvent based Repairers or renovators are available, Repairers usually only effective in non flexing parts of the shoe.	No top dressing necessary. Creams or special cleaner polishes are available if required

PROTEIN	Water and solvent based are suitable although water based may remove some of the color.	Water based preferred. Special base coats are available.	As for resin	Water based dressings preferred. When special base coats are used (see filling) solvent based can sometimes be used.
EASYCAR E (e.g. scuttresistant)	Solvent based	Not necessary	Solvent based Preferred but. may be difficult (as with patents)	Solvent based dressings are preferred or polyurethane based materials. Creams are also suitable. Little dressing should be required.
RUB-OFF	Solvent based or sometimes stronger cleaners are required	Not necessary	As for resin using color similar to original rub-off	Solvent based preferred. Sometimes top dressing may not be necessary." Creams or waxes often used.
SUEDE	Brushing	Not necessary	Suede dyes are suitable to match shade.	Colored sprays are available. Water proofing sprays are also available.

THE TREATMENT OF SYNTHETIC (MAN — MADE) UPPERS

SYNTHETIC MATERIAL	CLEANING	REPAIRING	DRESSING
POLYVINYL CHLORIDE (P.V.C) COATED FABRIC	Solvent based preferred. Special cleaner/polishes are available, Hand cleaning recommended.	Some hard repair sticks are available solvent based repairers should be used. Repairing is difficult.	Solvent based dressing is available but is not usually necessary. Creams, cleaners, polishes for general cleaning and finishing are available.
POLYURETHANE COATED FABRIC (P.U.C.F)	As for PVC	Not usually possible.	As for PVC
PROMERIC	As above	Solvent based renovators and repairers should be used. Repairing	Solvent based dressings are generally used but some water based dressings are available creams/cleaner polishes usually adequate.

6.6 SELECTION OF DRESSING SYSTEM FOR LEATHER:

Before selecting a system the Shoe Room supervisor should know:

- ✓ The type of finish on the leather.
- ✓ The final requirements of the upper in terms of gloss and handle
- ✓ The range of commercially available Shoe Room products. The product is new it is essential to a range of suitable Shoe Room systems and select the most appropriate

Chapter 7

BOTTOM FINISHING

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CHAPTER SEVEN

BOTTOM FINISHING

In most of the cases we use unit sole in industry for making the shoe. In Bangladesh sole finishing is very rare case for unit sole. We use unit sole according to the buyer instruction for export which we collect from many sole producing company or import from foreign country. In those sole finishing has been already done. Some cases we do sole finishing by spraying color, or using wax for getting brush off effect. So for unit sole finishing is not important for Bangladesh but if we use manually produced (handmade) sole in shoe that cases we have to do sole finishing. A sequence of finishing is given below-

- i. Heel Paring
- ii. Heel Scour (Rough and Fine)
- iii. Edge Pare
- iv. Heel Scour (Superfine)
- v. Stain Heels
- vi. Smooth Heels
- vii. Gum Heels
- viii. Ink Edges
- ix. Edge Set
- x. Naumkeag
- xi. Bottom Polish
- xii. Heel Burnish and Seat Wheel
- xiii. Clean Uppers and Welt
- xiv. Slip Lasts

1. HEEL PARING:

The purpose of this operation is to remove any excess material from the heel and to impart to the heel its required shape. This is carried out by a pair of elliptical cutters set into a feed plate, traveling at 6000 - 7000 r.p.m. Guards and guides are fitted to the machine to

allow the heel to be fed at a pre-determined position. Because of the variety of materials used it is vitally important that the cutters are regularly sharpened; a special machine is provided for this purpose. A rending cutter is used to trim the seat portion. The correct result must be-

- ✓ Heel to be correctly shaped.
- ✓ Cleanly pared from heel corner to heel corner.
- ✓ No bumps or hollows.
- ✓ Not to be pared more than 1/32 inch into top piece.
- ✓ No damage to upper.
- ✓ Heel seat to be cleanly rounded.

2. HEEL SCOUR (ROUGH AND FINE):

Abrasive bands are fitted to revolving rollers which scour the heel in progressive stages, first roughly and then finely. The heel is positioned to the roller which is generally fitted with a width guard and fed against the roller. Rough scouring removes any knife marks from heel paring while fine scouring removes any deep scratches from rough scouring. Burning or charring may occur if too great a pressure is exerted. Care must be taken to avoid damage to the upper.

The correct result must be:

- ✓ Heel to be scoured from corner to corner
- ✓ Heel to be correct shape
- ✓ Heel to be smooth - no scouring marks
- ✓ No damage to upper
- ✓ No charring on upper

3. EDGE PARING:

This is an important Operation in that it can make or mar the appearance of toe finished shoe. The operation consists of removing excess material from the sole edge to produce a uniform sole shape. High speed rotary cutters are used having various profile

shapes according to the style of edge required on the sole. Maintenance of the correct cutting angle and the sharp cutting edge are fast or most important. Most leather sole edges are first pared dry, then wetted with a special fluid and pared again. This serves to lay down the leather fibers produces a much smoother feather edge.

The correct result must be:

- ✓ sole to be correct shape
- ✓ Angle of edge to be correct
- ✓ joints to be in correct position
- ✓ Edge pared complete to heel corners
- ✓ Edges smooth - no burning or charring
- ✓ Edge distance as specified
- ✓ No damage to uppers

4. HEEL SCOUR (SUPERFINE):

This operation is the same as the previous heel scouring using a superfine abrasive, usually emery. This ensures that the heel lines up accurately with the waist of the sole.

5. STAIN HEELS:

A coat of water based edge finish (as used for sole edges) is applied by bristle brush around the seat area of the heel. This is followed by an application of a spirit based finish by camel hair brush. This serves to swell the fibers of the heel and give an adequate base for later heel finishing operations.

6. SMOOTH HEELS:

This is carried out in the same manner as heel scouring but using either a worn superfine abrasive or turning the abrasive over to use the cloth backer. This serves to key the finish into the heel to improve its waterproofing properties and to give it a semi-polished appearance.

7. GUM HEELS:

A coat of spirit veneer is now applied to the heel by camel hair brush. This must be applied smoothly and allowed to dry to prepare the heel for the later operation burnishing.

8. INK EDGES:

Water based edge completely and evenly covered with ink, but there must be no ink on the upper, sole or any stitching.

9. EDGE SET:

This machine has four heads and can be used by two operators. Each head carries a heated oscillating iron which has an identical profile to that produced by the earlier operation of edge paring. The oscillating action of the heated iron melts the previously applied wax and forces it into the fibers of the sole edge. This consolidates the edge increasing its water resistance, and gives the polished appearance.

The correct result must be:

- ✓ Edge to be completely and evenly set
- ✓ No burns
- ✓ Sole edge profile well defined
- ✓ No wax on uppers
- ✓ Joints correctly positioned
- ✓ Glossy appearance

10. NAUMKEAG:

The machine consists of a rotating inflatable rubber pad, covered with a fine grade abrasive disc. This removes the grain surface either over the whole area of the sole or around the edge, according to requirement. Care must be taken to prevent excessive removal of the grain otherwise the appearance may be marred.

11. BOTTOM POLISH:

A finish may be applied by brush or spray gun, allowed to dry and then wax polished on a revolving linen mop and soft hair brushes. Alternatively a friction wax may be

used which colors the sole and impregnates the surface. This also requires wax polishing, bekssole bottoms require an additional operation of burnishing with a leather pad before polishing.

12. HEEL BURNISH AND SEAT WHEEL:

There are two alternative methods of heel burnishing

➤ COLD WAX BURNISH:

A block of finish wax is applied to a revolving pad consisting of closely peaked section of material. The pad provides polish which is then followed up by a final treatment with a camel hair brush.

➤ HOT WAX BURNISH:

The machine is fitted with a heated wax pot above a cotton covered pad. Hot wax is dripped onto the pad as required. The heel is held against the pad to apply a coat of the melted wax. An identical pad is then used to give the burnishing treatment followed by brushing to produce a high gloss finish.

The seat wheeling is carried out on a rotating wheel of which the lip is a fixed member, whilst a row of teeth free-wheel. The seat portion of the heel is applied to the wheels to produce indentations around the edge of this area, while the lip serves to iron the top edge to ensure a complete line up with the edge setting of the sole.

13. CLEAN UPPERS AND WELTS:

Surface dust is removed from the upper by brushing on rotating soft brushes. A tapered stiff bristle brush is used to remove dust and wax from the welt and sole edge.

14. SLIP LASTS:

The last is slipped from the shoe making sure that all lacing strings or gusset stays have been removed and buckles loosened. There are many variations to this sequence which will be applied *to* suit the needs of the construction and soling materials. The shoes are now ready to go into the Treeing department.

QUALITY CONTROL OF SHOE FINISHING

7.2 CONCEPT OF QUALITY:

A quality is the totality of features and characteristics of a product or service that bear on its ability to satisfy started or implied needs. Five principles approaches to defining quality can be identified:

The transcendent: According to this view, quality is something timeless and enduring about its style.

The product based: According to this view, the product produced should have all the adequate properties.

The user based: According to this view, the product has to have best satisfying properties and preference of the users according to their needs.

The manufacture based: According to this view, a product should achieve all the necessary chemical and physical properties.

The value based: This view actually defines quality in terms of costs and prices. So, quality leather means which posses all the qualities mentioned above.

7.3 QUALITY CONTROL PROCEDURE OF SHOE FINISHING:

For the quality control procedure of shoe finishing the following attempt should be maintain:

1. At first the quality controller should not received the faulty shoes which cannot be removed in finishing.

2. Sock lining should be inserted properly. Size of sock lining should be same to the shoe size. No wrinkle is allowed in sock lining and it is essential that the lining of the shoe should be kept clean when inserting the sock after painting.
3. Cleaning is done very carefully. A small blunt knife is used to scrap away any dried ink, crepe rubber is rub off smoothly to remove any adhesive, proper amount cleaners is used to remove any marks.
4. Ironing should be done in proper temperature. It should be between 60-75°C for high temp. Ironing Teflon tape must be used. The purpose of this operation is to iron or hot blast the shoe whilst it is held on a shape identical to the original last, so that no distortion may appear in the shoe as it is prepared for the final process of boxing up.

Care must be taken to smooth out the leather and not to strival it up. The hot blast also needs particular care in operation to prevent scorching, as if the blast in too fierce not only until the leather be burnt but the upper stitching and probably the finish of the heels and edges also rewind. Edge inking should be done properly.

5. In the case of dressing the condition of sponge itself is of fine texture, if there large holes an uneven flow will result from the sponge and unsightly streaks will show. It must also be thoroughly clean. It is obvious that in the general application by spray, the dressing must be colorless, otherwise the linings and edges will become stained.
6. The best results are only obtained by using the spray carefully and by moving both the shoe and the gun in the correct is also of the greatest importance that the air pressure to the gun is maintained at between 50 to 60 lb/sq in for general upper spraying.
7. The shoes must be submitted for a final examination before boxing. Any damages to the upper must be repaired if possible or the shoes rejected or returned to be pulled up and put in order.

8. After the final examination and repairing the shoes are given a last polishing up of the edges and bottom which may have become slightly dulled during the various repairing process. For the quality control of a shoe the above attempt should have to be maintained. If we follow above mention it is sure that the shoe will be a quality full shoe.

The success of shoe finishing is due to the care that has been taken to ensure accuracy at all stages of the shoe making from pattern making to the finishing.

Chapter 8

SHOE MAKING PROCESS OF DERBY SHOE

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CHAPTER EIGHT

SHOE MAKING PROCESS OF DERBY SHOE

OWN DESIGNED DERBY SHOE



Picture-1



Picture-2

8.1 THE DERBY SHOE:

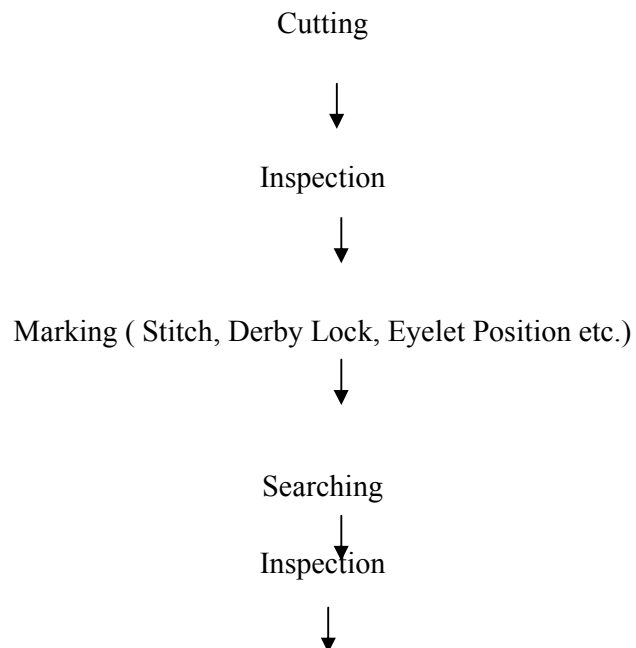
The first shoe to be covered in details is a classic which has become a firm favorite again in recent times.

It is tie shoe with the quarters stitched on top of the vamp.

8.1.1 SEQUENCE OF OPERATION:

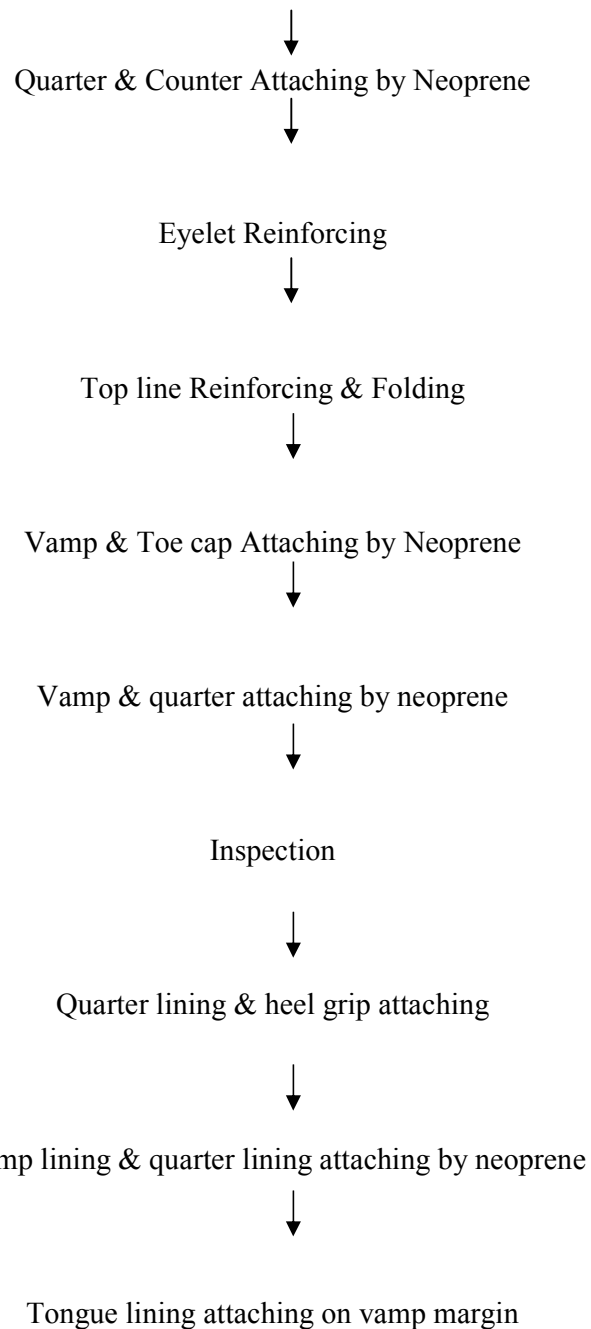
- ✓ Article Name: Derby shoe
- ✓ Style: Classic
- ✓ Last Name: Classic-1
- ✓ Last Size: 08
- ✓ Upper Leather: Cow
- ✓ Lining Leather: Cow

8.1.2 PROCEDURE:



Skiving

Locating	Type	Thickness	Width
Underlay	Tappered	50% of	8mm
Folding	Tappered	Total area	8mm



↓
Inspection

↓
Ready upper & ready lining attaching

↓
Stitching

↓
Thread specification

Loc.	Pos.	Color	Tkt No.
Upper	Top	Black	60/3
Lining	Bottom	Beige	60/3

↓
Needle specification

System	Size	Point
134	90	LR

↓
Stitch specification

Location	No. of rows	Distance	St. length	S. density
Upper	1	1.5 mm	2 mm	5/cm
Whole lining	1	1.5 mm	2 mm	5/cm

↓

Seam rubbing & tapping



Top line trimming



Thread burning



Edge coloring



Eyeleting



Inspection



Upper complete

8.1.3 LASTING & FINISHING:

- ✓ Article Name: Derby shoe
- ✓ Style: Classic
- ✓ Last Name: Classic-1
- ✓ Last Size: 08
- ✓ Upper Leather: Cow
- ✓ Lining Leather: Cow
- ✓ Sole: TPR (unit sole)

Searching



Insole preparation



Toe puff & counter stiffener insertion



Insole moulding



Insole attaching by tack



Toe lasting by machine



Heel lasting by machine



Inspection

Heat setting

Temperature	Time
80-110 ⁰ C	5-8 min.



Roughing & scouring



Inspection



Upper cementing



Outsole cementing



Heat reactivation

Location	Temperature	Time
Upper	40-90 ⁰ C	5-10 sec.
Sole	40-90 ⁰ C	5-10 sec.



Sole laying & sole pressing



Edge Cleaning



Chilling

Temperature	Time
-2 ⁰ -5 ⁰ C	3-5 min.



Delasting



Sock attaching by latex



Cream application



Brushing



Lacing & Stuffing



Inspection



Packaging

8.2COSTING

Costing sheet for sample-1 (Derby Shoe):

Style no.	Last no.	Mens/ladies/children			
	Classic-1	Mens			
Type of shoe	Customer	Costing size			
Men's Derby		8			
Price validity	From		To		
Currency rate					
Shoe components	Amount	Unit	Price	Unit	Cost(r)/prs
Upper material	2.25	Sq.ft	110	Sq.ft	247.5
Lining material	.56	Sq.ft	65	Sq.ft	31.36
Socks	.39	Sq.ft	65	Sq.ft	25.35
Interlining textile					
Needles(34LR&134 PCL)	2/50	Pcs	130	10 pcs/ Pkt	.52

Thread(60/3)	12.14	meter	90	Cone 1000m	1.09
Thread(40/3)	12.14	meter	90	Cone 1500m	.72
Thread					1.81
Tapes(200mm wide)					
heel grip					
Laces					
Elastic		meter	30	meter	3
Eyelet (Brass Blend)					
Metallic Trims					
Consumables, thermo adhesive for folding, rubber sole etc					.28
Counter	1	Pair	170.00	55pair/s heet	3.09
Toe puff	1	Pair	170.00	65pair /sheet	2.62
Unit sole of TPR	1 pair				50
Insole					12
Shoe consumables glue/finish	Latex 0.68, PU ade-5.68, neoprene finish- 2.50				10.65
Shoe box					7.00
Shoe carton					25.8
Total material cost					421.28
Provision for rejection					
Direct labor					22.00
Overheads					17.00
Total cost					460.28

Chapter 9

TEST OF FINISH FILM

Chapter Outlines: 95-98

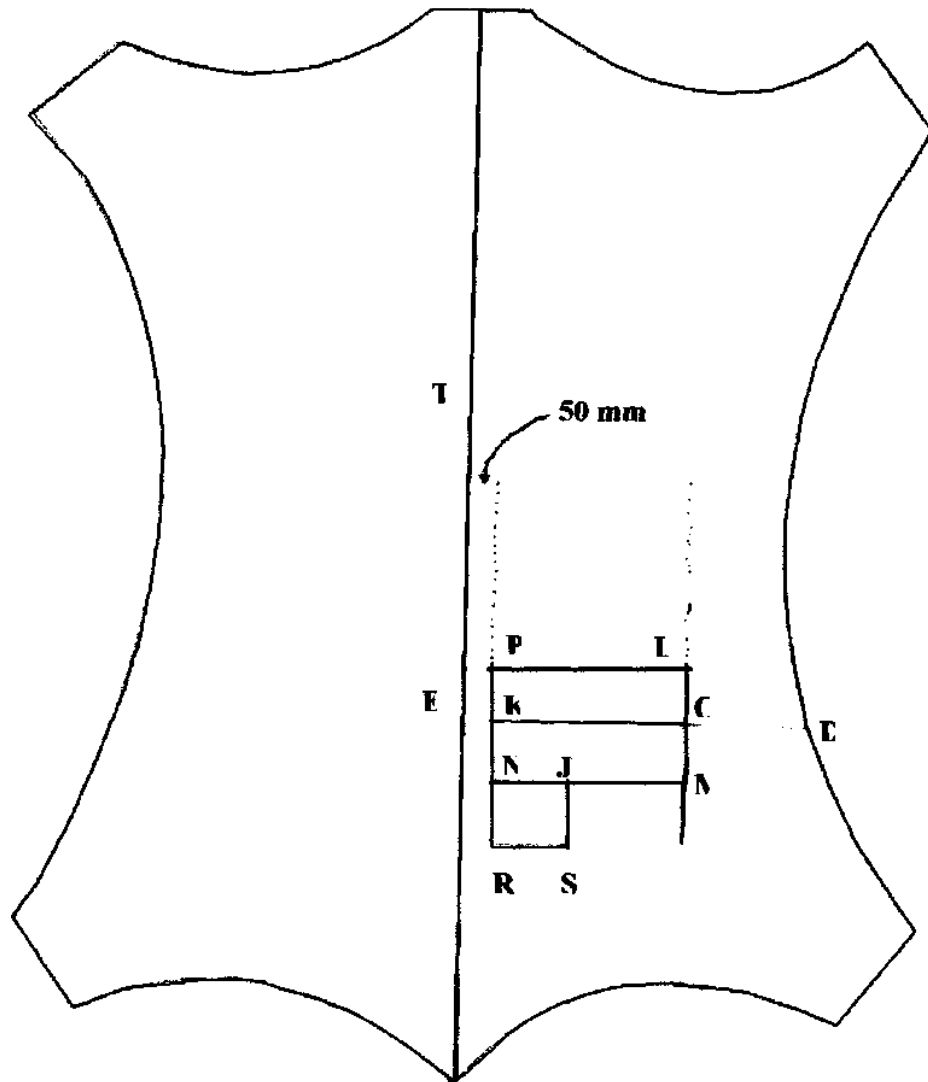
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✓ ADHESIVE TAPE METHOD	
✓ WET AND DRY RUBFASTNESS	
✓ RESISTANCE TO SOLVENTS	
✓ RESISTANCE TO WATER STAINS (WATER SPOT)	
✓ RESISTANCE TO DRESSING AGENTS	

CHAPTER NINE

TEST OF FINISH FILM

9.1 SAMPLING POSITION OF FULL HIDES/ SKINS:

- ✓ “PLMN” rectangle area for physical testing.
- ✓ “JNRS” rectangle area for chemical analysis.



FOR FULL LEATHER

9.2 TEST OF FINISH FILM

BOND STRENGTH BETWEEN THE LEATHER SURFACE AND THE FINISH FILM:

Bond Strength between the Leather Surface and the Finish Film. The anchorage between the finish film and the leather surface and between the individual finish coats can be tested in two ways-

ADHESIVE TAPE METHOD:

A strip of adhesive tape of approximately 50 mm length is pasted to the finished leather surface in such a way that 10 mm length of the tape remains outside the leather. The 40 mm length of the tape is rubbed several times with finger on the leather surface so that the tape is nicely pasted to the leather surface without any air bubble inside. After 15 seconds, the tape is stripped off holding the 10 mm long free end. No finish should adhere to the tape if the bond between the leather surface and finish film is strong and satisfactory.

WET AND DRY RUBFASTNESS:

It is actually a test for the finish film and not for the leather. The German Standard, DIN 54021. Specifies a method by the Kraiss" tester or veslic in which a white felt at a force of 1 kg load moves back and forth on the finish side of the leather through a distance of 10 cm. The felt may be dry or wet. In SATRA instrument the circular dry felt at a speed of 2.5 kg rotates on the finish side of the leather and in the Case of wet felt the load is only* 0.75 kg. In both the cases the stained felts are compared with the grayscale. In the case of white leather the color of the felt should be dark blue or black but never white.

RESISTANCE TO SOLVENTS:

During the manufacture of Shoe and many types of leather articles the non-aqueous adhesive- is sometime applied to the unfinished flesh side of the leather. The solvent

of this adhesive may reach to the finish film through the leather. Sometime 'the cap stiffeners are dipped in solvents to soften or render them moldable. So leather finish should have sufficient resistance to solvents. The number of Solvents is vast and most of them are esters, ketones alcohols, chlorinated hydrocarbons, benzene and its substituted products etc. Useless and otherwise stated the resistance of leather finish film to solvents is determined for acetone and tricolor ethylene.

Nearly one cc. of the solvent is slowly applied to the unfinished flesh side of the leather with the help of a burette. The leather is then turned upside down and kept in that condition for one minute at room temperature. Finally dry rub fastness test is carried out on the grain side of this leather either in SATRA or Veslic machine. Both the pad and the leather (after drying) are compared with respective grey scales.

RESISTANCE TO WATER STAINS (WATER SPOT):

If the finish surface of a leather, particularly protein glazed leather (like glace kid), receives a drop of water and the latter dries up on the leather surface a special type of water stain may be formed. The stained area generally becomes matt and, dull, water spot generally noticed when the shoes or glazed leather goods come in contact with rain drops and the water dries up on leather.

To test this resistance a drop of water is put on the finish surface of the leather and allowed to dry overnight. If any stain is developed then stained area is rubbed with a soft cloth. If the stain is not removed small quantity of colorless shoe polish is applied there and again rubbed with a soft cloth, if the stain does not go out this time also, the leather should be considered of poor water-stain resistance.

RESISTANCE TO DRESSING AGENTS:

The actual compositions of shoe dressings are not generally disclosed by the shoe manufacturers but most of them are based on any one of the following three colorless emulsions- So this test is carried out with these emulsions one after another.

- ✓ A water-free solvent containing wax dressing.
- ✓ A nonionic wax emulsion containing solvents and water.
- ✓ A solvent free aqueous, nonionic wax emulsion.

To carry out the test, the emulsion is applied on the finish sides of two pieces of leather with finger. The surface of one piece is then immediately rubbed with a dry linen cloth either by hand or in fastness taster (ten times in the krais tester) and the surface of the second piece is rubbed in the same manner after 30 minutes when the solvent of the emulsion has evaporated out. The linen clothes for both the leather pieces are then examined for stain development and compared with, the grey scale.