

ELECTRODRY GROUP

Upholstery Cleaning Manual



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Introduction

Upholstered goods are a popular part of our decor and surroundings and as with any fabric are required to be maintained and therefore cleaned. Under normal soiling conditions it is recommended that most upholstered furniture be cleaned every 12-24 months.

Evidence of hand-woven fabrics dates back many thousands of years. Some of the earliest known fabrics are linen cloths found as mummy wrappings in ancient Egyptian burial tombs. Egyptians have been weaving fine high weave count fabrics some 4000 years before Christ. Even today, some of the finest fabrics in the world are produced in Egypt.

With the advent of the industrial revolution mechanised weaving came into existence. Machines that were more intricate were invented such as the jacquard machine, named after its inventor. These machines meant that the rate of fabric production was increased while at the same time decreasing the cost price of goods, making them more available for general purposes. The continuation of industrial development led to the discovery of synthetic fibres (man-made) which became very popular and are still widely used at present. All of this contributed to the development of the upholstery industry as we know it today.

Development of fibres and fabrics is still continuing at an accelerated pace to satisfy consumer demands for more sophisticated colours, styles and textures.

Upholstery can be made out of different fibres, all of which have some specific and unique characteristics. The basic cleaning rules can generally be applied to the majority of fabrics on the market today.

Professional upholstery cleaners need to be constantly updating their knowledge of current technology and trends in order to be at the leading edge of this ever-changing industry.

There are many general misconceptions related to upholstery cleaning. It is frequently heard that:

- Upholstery is too difficult to clean
- It is expensive if we make a mistake
- There are too many fabrics on the market so it is better not to touch them
- Some fabrics don't clean well, no matter what we do
- Some customers can be fanatical about their furnishings and impossible to please.

All the above is true if the upholstery cleaner does not have the required knowledge to do the job. The purpose of this course is to provide that knowledge, making the cleaner more professional, thus providing the ability to overcome and dispel these misconceptions.

Promoting Additional Services

Most people have either upholstered furniture, curtains or blinds that need to be cleaned. If you have been in the carpet cleaning business for a number of years, this probably covers most of your customers.

It is important that you mention to your customers the list of all services that you can professionally deliver. Doing additional work for your existing or new customers while you are already on site can save greatly on all business running costs. These include vehicle, promotional and advertising costs. It is important always to do your best and offer a professional service without making any claims that you can not guarantee to deliver.

A satisfied customer will not only use your service again, but will work as a free advocate for your business by recommending you to friends and associates. However, don't expect a customer to remember who you are, if you don't give them something to remind them of you. There is lots of marketing books out there that can help you in this area. We recommend that you become familiar with various marketing techniques and select those that are appropriate for your business.

Whatever marketing ideas you use will have minimal effect unless they are used consistently and in conjunction with the quality professional service.

Quality professional service means not only providing promptness and efficiency, it also includes giving value for money and excellent results.

Good Business Practice

Professional upholstery cleaners are expected to provide the following:

Quality service

This incorporates a reliable, prompt and efficient service. The client should be advised as to all procedures. The attending technician or technicians should be punctual, polite, helpful, and understanding of the clients' needs in relation to their goods to be cleaned. They should also be correctly attired (wear clean, correct uniform, etc.)

Quality equipment

This means vehicles and equipment that must be readily available and in good working order at all times. All equipment should be properly labelled with the Company name, telephone numbers and address as well as any appropriate safety advice. All equipment and vehicles should be checked and maintained regularly, without waiting for breakages to occur. Each vehicle should be presentable

and properly signed written. It should be clearly defined who is responsible for the maintenance of equipment and vehicles to ensure their availability and readiness.

Qualified staff

This requires that all personnel involved in all of the procedures are properly trained and skilled in their areas of involvement. This could include the receptionist (telephonist), office staff, on-site technicians and factory/warehouse staff (at times some furniture cannot be cleaned on site). This could mean attending appropriate Training courses relevant to the job specification of each member of staff involved.

Communication skills are of the utmost importance for all personnel involved in the Service industry.

Documentation

Provision of professional documentation, which means the availability of all appropriate forms, starting with the initial telephone call checklist, pre-inspection forms, through to a final account.

Chemicals, etc.

Provision of chemicals and appropriate ancillary supplies must be constantly maintained and re-stocked. All chemicals should be clearly labelled and stored in appropriately ventilated areas. For all chemicals that are used and carried either at the factory/warehouse, in each vehicle or on site material safety data sheets (MSDS) must be available.

Health and Safety

Ensuring safety is a prime responsibility of any professional. These incorporate provision of a healthy and safe environment for the technician as well as customers.

Chemical Safety

General Chemical Safety

1. Store chemicals securely in correctly labelled appropriate containers.
2. Containers used on site should be correctly labelled

3. All safety data sheets (SDS) must be available wherever chemicals are being used or carried (vehicle, on site, factory)
4. Carry and use protective equipment such as chemical resistant gloves, respirators with appropriate filter cartridges and eye protection.
5. Dispose of waste and unused chemical properly in accordance with local regulations as per Australian and New Zealand standards
6. When mixing chemicals for cleaning upholstery always read the label of the container and mix chemicals according to the manufacturer's directions
7. Always read labels and observe safety considerations
8. Never mix chlorine bleach with ammonia as it creates ammonium gas, which is poisonous
9. Do not sniff chemicals or containers to find out what it is. If in doubt, throw it out
10. Wash your hands well after handling any chemicals or containers with chemicals
11. Avoid skin contacts with chemicals. Acids and alkalis can burn the skin
12. Hydrofluoric acid rust remover has an anaesthetic effect and is dangerous because it attacks skin rapidly and the damage will not be felt immediately. It should never be used without wearing rubber gloves
13. Continuous exposure to even the mildest of chemicals can lead to problems. Nearly all chemicals can have a threshold limit value (TLV). This rates the parts per million at which exposure may become a problem
14. Always cap your chemicals immediately following their use
15. Never leave any chemicals unattended
16. Ensure that children or pets do not have access to the area while chemicals are being used

Solvents Chemical Safety

1. Always store in properly labelled, manufacturer approved containers
2. Wear protection as required

3. When dry cleaning fabrics using an extraction system it is important to use personal protective equipment designed for use with specific solvents
4. When choosing a respirator to use with any dry cleaning solvent, wear an organic vapour respirator and choose cartridges approved for the specific solvent that you are using
5. Disposal of dry cleaning solvent should be done at an approved solvent disposal site and/or in accordance with local laws
6. Do not over-heat solvent as solvents are combustible (can explode)
7. Always provide adequate ventilation during and after cleaning until all fumes have dissipated. This can include the use of drying fans to blow in fresh air
8. When using an extraction system to dry clean fabrics on location always vent the exhaust outside the structure taking care that fumes cannot build up in other areas like underground car parks, basements or go into air-conditioning air intakes and the like

Equipment Safety

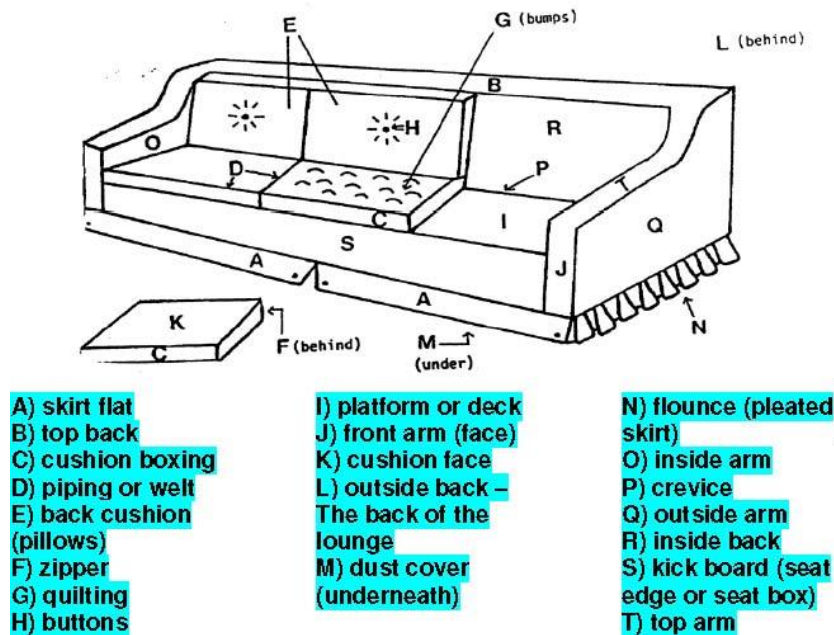
Electrical Safety

1. Have all electrical equipment regularly checked and serviced. Inspect power cords for wear, fraying or other damage
2. All electrical equipment that is not marked as being double insulated, should be properly earthed (grounded)
3. Use an earth leakage protection device and check all power points are earthed
4. Never disconnect safety features on equipment
5. Do not allow electrical cords or plugs to become wet
6. If you blow a fuse in a fuse box, replace it with the correct size fuse wire (15 Amps for power points are standard throughout Australia)
7. Disconnect power cords from sockets before doing any maintenance on your Equipment
8. Disconnect electricity before filling equipment with water

Site and Personal Safety

1. Arrange equipment so that it is out of traffic ways
2. Arrange hoses and power cords so that people cannot trip
3. Always ask people to keep children away from the work area at all times
4. When not using hoses, turn off pressure hoses to prevent accidental spraying of fluids and keep a tool connected to the vacuum hose to prevent accidental injury
5. Keep spotters under cover and under strict supervision at all times
6. Use drop sheet to help prevent slippery floors
7. Post caution signs to warn customers that floors may be slippery and give verbal warnings as well
8. Ask customers if any occupants suffer allergic reactions, and take appropriate actions or precautions. Certain chemicals (usually perfumed deodorants used in some chemicals, solvents, alkaline or acid solutions or enzymes) or even just raised humidity levels can trigger attacks in hypersensitive people. Sometimes the fine dust kicked up by pre-vacuuming or moving fabrics about can fill the air with Dust-mite soiling (a very well-known allergen)
9. Use correct lifting techniques to avoid back injury

Identification of Areas of Upholstery



- A) Skirt flat – a decorative flat section of fabric that is used to hide the legs of the furniture, similar to a valance on a bed
- B) Top back – the very top of the structural section of the lounge
- C) Cushion boxing – four sides of a cushion (not top and bottom)
- D) Piping or welt – the edges of cushions, pillows, or arms made of cord or Rope and covered with fabric
- E) Back cushion (pillows) – a separate cushion that the person's back leans against
- F) Zipper – self explanatory
- G) Quilting – a fabric style made up of three or more layers sewn together in a stitched pattern, which creates raised areas
- H) Buttons – a decorative attachment, which frequently is made of metal covered with fabric and is used to give a pleated appearance to the cushion
- I) platform or deck – the horizontal base of the lounge upon which the cushions rest
- J) Front arm (face) – the vertical section of the arm rest
- K) Cushion face – the part of the cushion that you sit on
- L) Outside back – the back of the lounge
- M) Dust cover (underneath) – the material placed directly under the lounge and is designed to protect the inside structure from dust accumulation
- N) Flounce (pleated skirt) – a decorative pleated section of fabric which is used to hide the legs of the furniture, similar to a valance on a bed
- O) Inside arm – the inside section of each arm rest
- P) Crevice – the area where the platform meets the inside back
- Q) Outside arm – the outside section of the arm rest
- R) Inside back – inside of the main structure upon which the back cushions rest
- S) Kick board (seat edge or seat box) – the area at the front of the lounge immediately above the skirt flat or flounce
- T) Top arm – the top section of the arm rest

The Upholstery Cleaning Equipment

You could clean upholstery with a toothbrush if you wanted to or maybe a fire hose, but the results may not be what the customer wants. Choosing the right equipment will make your job easier. The equipment can vary depending on the cleaning procedure you feel is necessary to do the work you choose to take on. It can also depend on your budget that you allocate for equipment purchases.

Upholstery Cleaning Tools

A professional upholstery cleaner will need the following basic tools:

1. Upholstery cleaning tool
2. Small scissors
3. Tweezers
4. Butane lighter
5. Magnifying glass (with light)
6. Ultra violet inspection light
7. Safety equipment (chemical resistant gloves, eye protection, a respirator with organic
8. Vapour cartridges, a first aid kit, a fire extinguisher
9. Towels preferably white
10. Drop sheets
11. A 600mm x 600mm piece of plastic fly screen
12. A roll of plastic wrap
13. Measuring jug
14. Buckets

15. Funnel
16. A selection of spray equipment ranging from 500ml hand trigger sprayers to a 4 or 5 litre pump up pressure sprayer
17. Assorted grooming tools: carding brush, velvet fluffing brush, tamping nylon brush, horse hair brush, upholstery bonnet mitt, lint and pilling brush, lint roller, grooming tool
18. Bone scraper or similar tool used to dislodge or agitate solid food type matter
19. Pilling shaver
20. Folding table
21. Plastic clamps for colour testing
22. Hairdryer

Upholstery Grooming Tools

Velvet carding brush (also called finishing brush)

It is a brush with fine stiff wire bristles. A brush used to correct pile distortion after wet cleaning velvet upholstery. It is used to groom and set the nap of velvet upholstery fibres while they are still wet. It will eliminate hand tool marks and will set the nap in one direction to speed up drying and reduce shading. It is imperative to use this tool when cleaning velvet upholstery.

Horsehair brush

Very popular brush used for cleaning of upholstery. It is used for agitation and distribution of cleaning solutions. Made of natural horsehair, this brush is very gentle and particularly useful for wool and cotton fabrics.

Tamping brush

This nylon bristle brush is used to “tamp” the solution into the fibres allowing better penetration of solution into the fabric without hurting it. This brush is most useful for applying spotting solutions and working them into the fibre. It should be used with tamping motion rather than rubbing one.

Upholstery bonnet mitt

Similar to a rotary floor bonnet but with a slot for inserting your "gloved" hand. Very handy for the application and agitation of preconditioning agents to upholstery fabrics. Excellent to use on delicate fabrics.

Velvet fluffing brush

This brush eliminates the clumping and stiff matted feeling on velvets and other napped pieces. Most handy brush to use for dry finishing velvet.

Furniture lint and pilling brush

Prepares fabrics for cleaning by removing lint and pills of the fabric. Handy brush to have and use prior to cleaning procedure.

Lint roller

Used to remove pet and human hair off upholstery.

Equipment

Vacuum and extraction equipment

1. Vacuum equipment capable of dry soil pick-up and filtration (generally commercial vacuum cleaner with upholstery attachment and a crevice tool) is called a "dry vacuum".
2. Vacuum equipment capable of removing excess moisture from a fabric is called a "wet vacuum".
3. Equipment that injects water-based solution into fabrics and then removes excess solution along with suspended soil is called a "hot water extractor" (or steam - cleaning machine). These can range from small hand held machines with single vacuum motor and small water pump, to independently powered truck mounted machines weighing around a tonne and having water delivery pressures around 1000 psi. A smaller extraction machine can be used exclusively for upholstery cleaning.

The advantages of using the separate, smaller machines are:

- 3.1 delivers reduced water and vacuum pressure to a level that will not cause undue stress on certain fabrics
 - 3.1.1 can free up the carpet-cleaning machine while upholstery work is being done
 - 3.1.2 will cost less to run per hour than a big "truck mount"

4. Vacuum equipment capable of dry solvent delivery and pick-up is called a dry solvent extraction (DSE) machine. Not all machines are capable of handling dry cleaning solvents. Thus, the machine that is used for this purpose should have the following features:

- 4.1 a solution pressure system capable of withstanding solvents

- 4.2 a built in thermostat to prevent overheating of the solvent

- 4.3 a vacuum system capable of recovering dry solvents

- 4.4 a system of exhausting the solvent fumes to the outside of the building

Vacuum pressures

The vacuum system of the equipment should be sufficient to remove solutions and or soiling but not be overly aggressive. Insufficient vacuum can leave fabrics too wet with fluids and too much vacuum pressure can damage delicate fabrics.

Solution pressure system

Solution pressures in the range of 40 p.s.i. to 100 p.s.i. will be adequate for most fabrics. The solution pressure system should be sufficient to inject solutions into the surface fabric, however too much pressure could force fluid into the backing structure and creating over-wetting situations. Higher pressures may be used on fabrics that are more durable but care must be taken to avoid wetting the fillings or over-agitating delicate fabrics.

Heating systems

Higher cleaning temperatures provide a number of benefits. These include:

1. Better chemical activity
2. More rapid cleaning
3. Accelerated drying
4. Increased sanitising capabilities

The technician should have means to raise cleaning temperatures to appropriate levels. Generally, self-contained heating apparatus is in-built into the cleaning equipment. However, if not available,

the use of an immersion heater either placed into the tank of the cleaning equipment or a separate bucket will provide the same result.

Fibre Identification

The Importance of Knowing the Fibre

The customer has chosen their interior furnishings for a variety of reasons, some of which are, but not necessarily in this order:

1. Looks
2. Colour
3. Pattern
4. Style
5. Price
6. Level of comfort

They will seldom choose their furnishings based on the following:

1. Durability
2. Physical strength
3. Colourfastness
4. Construction
5. Cleanability
6. Resistance to soiling and stains
7. Specific fibre characteristics

Yet, these characteristics are of prime importance to the professional upholstery cleaner. There are many different fibres and each has its own set of specific characteristics. There are advantages and disadvantages in each fibre. A person purchasing furnishings will more often than not, be purchasing for emotional reasons (appearance or feel or comfort), and will give little thought to how it is to be maintained.

As a professional cleaner we are called to bring the upholstered article back to its original condition or as near as possible to it. To achieve this result we need to understand and identify the fibres, so that correct cleaning procedures can be implemented. We must do everything that we can to remove soiling and stains without upsetting the appearance, feel or comfort of the furnishings.

We need to know in advance that a fabric can withstand certain elements of our Cleaning techniques or whether we need to make adjustments to our techniques and such to match the characteristics of a particular fibre, fabric or construction method. Customers' expectations might also need to be adjusted.

Therefore, identification of fibres and knowledge of fabric construction is of utmost importance to upholstery professionals.

Fibres

A single strand of fibre is called a filament. There are two types of filaments: staple and continuous.

A staple filament is a relatively short fibre either natural or synthetic, which is twisted into yarn. They range in length between 9-15 centimetres. It can be made by cutting continuous filaments into short lengths to form staple fibres. Staple filament has to go through a blending and carding process before it is spun into yarn.

A continuous filament is a fibre that runs continuously through the length of the yarn. Continuous filament yarns are only possible in synthetic fibres and silk (a natural fibre).

Fibres can be separated into two categories: natural and synthetic (man-made fibres).

Naturally Occurring Fibres

Natural fibres are produced from living organisms: i.e. Plants, animals or insects.

Fibres derived from plants are referred to as cellulosic or vegetable fibres.

Natural cellulose fibres used in upholstery are cotton, linen and jute. Cellulose fibres contain a reddish-brown gum or binder called lignin. Lignin is readily dissolved in the presence of alkaline cleaning solutions. Lignin makes up about

1% of fully processed cotton and about 24% in jute.

Fibres produced by insects or animals are referred to as protein fibres. These are wool and silk.

All natural fibres are very absorbent, therefore extra drying time or forced drying is required.

Specific Characteristics of Natural Cellulosic Fibres

Cotton

1. it is a staple fibre
2. grows from the flower and seed of the cotton plant
3. Through a process called ginning seeds are removed from cotton fibres
4. the process used to untangle the fibres is called carding
5. following ginning and carding the fibres can then be spun into a fine yarn
6. it is relatively inexpensive
7. it is easily dyed and is relatively colourfast
8. it blends readily with most fibres
9. it is highly flammable
10. it is a very absorbent fibre and for that reason needs assisted drying The same applies to linen and rayon fibres
11. moisture absorbency level before saturation is 20%
12. it is generally wet cleanable
13. it will withstand high water temperatures
14. can not be cleaned with high alkaline cleaning agents (pH 10+)
15. it is sensitive to acid cleaning agents
16. it is best cleaned with a neutral cleaning agent (pH 4.5 – 8.5)
17. can be damaged by bleaching agents
18. can be permanently stained by sweat and soiling

19. can be subject to browning, which can be prevented by controlling the amount of moisture applied, pH of the chemicals used and rapid drying
20. a binder present in cotton plants that can dissolve in water based solutions and cause browning is called lignin
21. glazed, polished or chin cotton has a shiny finish
22. Polished cotton may lose its shiny finish in heavy use areas over time due to exposure to oily soils and abrasive wear. Mainly occurs on arm rests (top arm) and head rests

Incompletely ginned cotton (Indian or Haitian)

Indian or Haitian cotton is minimally processed (not completely carded and combed), which gives it a more natural, earthy look. Incompletely ginned cotton is turning up in finer grade fabrics these days and can be difficult to identify. Any fabric that contains cotton, even some satin and jacquard fabrics may contain cotton seed particles that have not been removed in a ginning process. The brown specks found in these fabrics contain tannin, which is a vegetable dye. Presence of moisture can cause this dye to run, causing intense staining. These fabrics require special treatment and attention both when cleaning and drying. Extra time should also be allowed both for cleaning and drying. Alkaline cleaning agents will affect tannin, therefore neutral or slightly acidic cleaning agents should be used.

Linen

1. a fabric woven from fibres obtained from the stem of the flax plant
2. generally used in flat weave styles
3. a staple fibre that becomes stronger when wet
4. moisture absorbency before saturation is 20%
5. can cost more than cotton and can be quite expensive
6. it is easily dyed and is often print dyed, but can be prone to crocking (rubbing off)
7. it is very flammable
8. it is very absorbent and often requires assisted drying

9. spotting linen fabric is often difficult because it absorbs the spot or stain
10. it is wet cleanable with high temperatures
11. can be damaged by high alkaline cleaners (ph10+)
12. can be damaged by bleaching agents, mineral acids and rust removal chemicals
13. can be permanently stained with sweat and soiling
14. can become brittle with age Therefore, care should be taken not to over agitate
15. when wet cleaning, mild acid rinse should be applied at the end of the process

PROTEIN FIBRES

Wool

1. is a protein fibre
2. it is a staple fibre
3. it grows on sheep and some other animals
4. the fibre is clipped from the skin of the sheep
5. it is then cleaned, blended with wool from other sheep
6. it is then carded and combed (a process called worsting)
7. it is then spun into a yarn
8. it has unique properties of strength, durability and flame resistance
9. it is usually quite expensive (compared to synthetic fibres or cotton)
10. it is easily dyed but fastness can depend on the quality of the dyes and the dyeing process

11. can be blended with other fibres
12. it is absorbent and can hold moisture even though the surface may feel dry
13. moisture absorbency before saturation is about 17%
14. it is wet cleanable with low pH and acidic solutions
15. can be damaged by strong alkaline agents
16. the international wool secretariat and wool fibre produces recommend that wool fabrics be cleaned with solutions that have pH between 4.5 and 8.5, and that have specifically formulated for wool
17. can be damaged by using very hot water or very hot dry solvent
18. will dissolve in sodium hypochlorite (chlorine bleaches)
19. can be easily stained by food acid dyes
20. it loses strength when wet and can distort the integrity of the yarn if over- agitated
21. as wool ages the fabric becomes weaker and therefore more susceptible to reactions from cleaning chemicals

Silk

1. silk is a protein fibre
2. silk fibres are produced by silkworms
3. it is a continuous filament fibre
4. It is a very strong fibre, which means it can be made into very fine yarn and therefore a very fine fabric. It consists of two strands of fibroin (80%) which are adhered with seracin or silk gum (20%)
5. it is usually the most expensive fibre
6. it can be easily dyed but fastness can depend on the quality of the dyeing
7. it has a naturally high lustre, suits satin weaves, and can be blended with other fibres to add thickness to the fabric
8. it is flammable
9. It is relatively absorbent. Moisture absorbency before saturation is up to 30%

10. it can be wet cleaned with extreme caution because protein in silk is very sensitive to cleaning chemicals
11. cleaning temperature should be kept below 60°C
12. Do not clean with high alkaline chemicals. Like wool, it prefers the chemical pH range 4.5 to 8.5
13. can be permanently stained
14. can water stain easily
15. fabric can degrade under heavy soiling
16. when silk fabric has been exposed repeatedly to perspiration, during cleaning, the fabric can be brittle and prone to split
17. extreme care needs to be taken as the fibre can be stretched with high vacuum pressures and will not return to its original shape
18. it will snag on any slight roughness on your hand tool
19. spot and stain removal can be severely restricted due to agitation restrictions and chemical restrictions

Synthetic Or Man Made Fibres

Man-made fibres can be produced in a variety of ways and will be from two main sources.

Vegetable or cellulose: rayon and acetates

Mineral: oil, coal, and natural gas: nylon, olefine/polypropylene, acrylic, and polyester.

Glass fibre: Synthetic fibres in general are less absorbent than natural fibres, therefore less drying time is required.

Rayon is an exception due to its extreme absorbency.

Rayon

1. rayon is a man-made fibre but it is made from cellulose material (cotton or wood pulp)
2. For cleaning purposes, cleaning technicians should treat rayon as a natural cellulosic fibre.
3. manufactured by taking sheets of cellulose and treating it with an alkaline solution
4. it is then regenerated into a fibre
5. it is extruded as a continuous filament

6. it can be made into a fine, high lustre fibre and is relatively inexpensive
7. it is easily dyed but not particularly colourfast
8. can be blended but this is not usual
9. it is highly flammable (like cotton)
10. It becomes very weak when exposed to moisture, and can lose up to 76% of its strength. It is considered to be the weakest of all the fibres when wet.
11. It is very absorbent, similar to the absorbency of cotton. Moisture absorbency before saturation is up to 20%
12. it is subject to distortion and shrinkage during cleaning
13. can be damaged by using high alkaline cleaning agents (ph10+)
14. can be damaged by bleaches
15. can be permanently stained with sweat and soiling
16. can be subject to browning
17. can be easily damaged by agitation especially when wet
18. Can be sensitive to heat. Cleaning with very hot water can result with creases on fabric. Cleaning temperature is recommended to be kept below 80°C

Acetate

1. this fibre originates from cellulose compounds but is reduced to liquid by various chemicals with names like glacial acetic, acetic anhydride and acetone
2. it is then extruded as a synthetic fibre
3. it is a continuous filament fibre
4. it is a high lustre fibre
5. it is often blended with other fibres to add lustre to the finished product

6. it is relatively inexpensive
7. it is easily dyed and is often print dyed but is not particularly colourfast
8. it is not very absorbent and will dry quickly
9. it is wet cleanable
10. it will withstand fairly high temperatures
11. can be damaged by using high alkaline or high acidic cleaning agents
12. will dissolve in acetone (nail polish remover)
13. can be permanently stained by sweat and soiling
14. can be subject to colour run

Nylon

1. nylon is a man-made polymer fibre, which is extruded and drawn under molten conditions
2. it is a very strong and resilient fibre
3. a continuous filament fibre can be cut into staple lengths for blending and carding
4. can be crimped or bulked to give a variety of textures and can be treated with a variety of finishes to give good stain and soil resistance
5. it is relatively inexpensive
6. it is easily dyed with acid dyes and is very colourfast
7. it can be blended with other fibres
8. moisture absorbency before saturation is about 4%
9. It is easily wet cleanable.

10. it will withstand very high cleaning temperatures
11. can be damaged by using high alkaline cleaners (ph10+)
12. it will completely dissolve in formic acid
13. can be stained by sweat and soils but a variety of stain removal treatments can be used
14. nylon fibres that are not treated with dye blockers are easily stained by food acid dyes such as cordials

Polyester

1. a man-made polymer extruded in molten state
2. it does not have the strength of nylon and is usually found in courser denier fibres
3. it is a continuous filament fibre that is usually dyed with disperse dyes
4. It is can be bulked or crimped to give a variety of textures.
5. it is fairly inexpensive
6. it has a plastic feel and is often used with cotton yarns to give it a more comfortable feel
7. it is not very absorbent to water but is absorbent to oils
8. moisture absorbency before saturation is about 0.5%
9. It is easily wet cleanable and most soils are readily removed. It also dries fast
10. it can withstand high cleaning temperatures
11. can be damaged by using high alkaline cleaning agents (ph10+)
12. Can be stained by oils in sweat and other oils due to its oleophilic properties. As the result will yellow with age
13. dry solvents may need to be used for removal of oils

14. often used to manufacture microfibre, which is a man-made fibre finer than silk (weight in grams of 9000 metres of microfibre is 1 denier)

Acrylic

1. acrylic fibre is a man-made polymer fibre
2. it is the synthetic fibre that most resembles wool in its appearance and is stronger than wool in durability performance
3. it is not as strong as nylon and is usually made in thicker deniers
4. it is a continuous filament fibre
5. it is usually cut into staple lengths and crimped to resemble the texture and appearance of wool
6. it is relatively inexpensive
7. it is usually solution dyed and is extremely colourfast and is rarely affected by most bleaching chemicals
8. it can be blended with other fibres
9. it is resistant to oils
10. moisture absorbency before saturation is about 1-2%
11. it is easily wet cleanable
12. it will withstand higher cleaning temperatures
13. By itself, can be cleaned with higher alkaline chemicals (pH10+). When blended with other fibres, the use of these chemicals is not recommended

Olefine / Polypropylene

1. Olefine is a synthetic, man-made polymer fibre. It is also commonly known as polypropylene

2. it is solution dyed and extruded as a fibre
3. does not have the strength or resilience of nylon and is usually found in thicker deniers
4. recent improvements in manufacture have seen finer, more resilient fibres being made
5. it is a continuous filament fibre
6. it can be cut into staple lengths and bulked to give a variety of textures
7. it is inexpensive
8. it is very colourfast
9. it can be blended with other fibres
10. by itself it is often used to make thick and light, open weave fabrics
11. It absorbs oils and has extremely low water absorbency. Moisture absorbency before saturation is about .01%. Olefin is a hydrophobic fibre.
12. Due to its hydrophobic properties, olefin is difficult to stain and can be described as the most difficult fibre to stain. However, if some staining does occur, olefin can be safely bleached with ½ to 1% solution of sodium hypochlorite.
13. it is easily wet cleanable
14. it has low melting temperature and if exposed to intense direct sunlight, like all synthetic fibres, may become brittle and split easily
15. due to its oleophilic (oil loving) property it attracts oily soils that may cause fibre to yellow over time

Fibre Identification Tests

It is important to note that a bunch of fibres are spun together to form a yarn. Many different yarns are woven together to make a fabric. A fabric can be composed of many different types of fibre. Even a piece of yarn may be composed of different types of fibre.

Before carrying out any upholstery cleaning it is important to test the fibre to identify the presence of cellulosic or protein fibres.

Fibres can be identified by using the chemical test or burn test or combination of both. Chemical tests are more precise, however as this test can not be used for all fibres in on-location situation, the use of burn test can be very effective for identifying upholstery fibres.

By observing the results of the burn test you may be able to identify, with reasonable accuracy, the fibres used in a piece of fabric. You will then be able to adjust your cleaning chemicals and procedures according to the limitations or needs of the various fibres that you identify in the piece of fabric.

Fibres that can be precisely identified by using chemical tests are wool, nylon and acetate.

Wool will completely dissolve in chlorine bleach. It is a slow process and at times might take up to 10 minutes for wool fibre to dissolve completely.

Nylon will dissolve completely and very rapidly in formic acid.

Acetate will dissolve completely in acetone (nail polish remover).

When using chemicals for fibre identification the following precautions should be taken:

1. Make sure all solutions are capped
2. Wear protective gloves when handling solutions
3. Do not inhale fumes
4. Use forceps when handling fibres submerged in solutions
5. Use correct disposal procedures for excess solutions

When performing on-location chemical test, ensure that any possible spillages cannot cause damage to customer's property.

Items Required For Burn Test

1. Butane lighter (matches are not advisable, as when lighted they give out pungent smell, that can mask the smell of the fibre being tested).
2. Tweezers for holding fibre while being tested.
3. Scissors to cut the strand of fibre.
4. Magnifying glass can be helpful as at times only very small strands of fibre can be obtained.

Procedure:

1. Find and cut a small piece of fabric that can be cut from the upholstery without causing any damage to the fabric's appearance. It can be usually found behind a cushion zipper. A sample should be taken from all parts of a fabric which appear to be different or are likely to be different.
2. It is recommended not to do the burn test over customer's property. Carry out the test over the sink or other surfaces not affected by heat or flame. Weather permitting it is advisable to do it outside.
3. Hold the cut sample of fabric by using tweezers.
4. Light the butane lighter and slowly approach the fibre with the flame, but do not ignite the fibres at that stage. Observe the reaction. Do the fibres shrivel away from the flame? If they do it is some indication that the fibre may be synthetic or protein.
5. Then move the flame to ignite the fibre. Once lit remove the butane flame.
6. If the sample continues to burn, blow it out.
7. To properly execute a fibre burn test you need to observe the following:
 - 7.1 flame action
 - 7.2 flame colour
 - 7.3 Colour and odour of the smoke.
 - 7.4 Was there a glow remaining for a time after the flame was extinguished?
 - 7.5 After the sample has cooled, pinch the burnt end with your fingers.
 - 7.6 What colour is the ash? What is the characteristic of ash? Crumbly, fine powder, hard bead or a combination of these?

CAUTION! Do not place the burning or freshly burnt fibre near your nose. It may still be very hot! With your hand, fan the odour of the burnt sample to your nose.

Assessing Result Of The Burn Test

Upholstery fabrics are frequently blends of different types of fibres, therefore the technician may not always be able to identify every fibre type.

You are basically looking for fibres that can present potential problems during the cleaning process or that require specific treatment.

The burn test is an indication only. It is not considered to be a scientifically accurate test. Caution should always be exercised when cleaning upholstery.

Practicing the burn test and the assessment of the results will improve the accuracy of your findings. Fabric samples can often be obtained from an upholsterer. Their display samples will often tell you what fibre or combination is used, so that you can practice the burn test to confirm the labelling on the sample.

The burn test chart should be studied and always be carried on site and used during burn test.

Fibre Burn Test Chart

Fibre	Flame/smoke	Odour	Ash
Acetate	Sputters orange flame	Acetic acid	Hard black bead
Acrylic	Orange sputters Dark smoke	Charred meat	Irregular, hard
Cotton	Scorches near flame. Yellow flame. Continues to burn. Ember when extinguished.	Burning paper	Powdery grey ash
Linen	Scorches. Yellow flames. Continues to burn. Ember when extinguished.	Burning paper	Powdery grey ash
Nylon	Blue base orange tip. Burns evenly. Puffs white when extinguished.	Celery	Black round hard bead
Olefine/ polypropylene	Draws away from flame. Blue base orange tip. Burns evenly.	Bitumen (asphalt) or hot tar	Round brown bead
Polyester	Orange flame Burns evenly Dense black smoke	Fruity	Round hard black bead
Rayon	Yellow-orange flame. Burns evenly. Grey smoke. Ember when extinguished.	Burning paper	Powdery grey ash
Silk	Sizzles orange flame. Burns unevenly.	Similar to burning hair	Round crumbly ash
Wool	Sputters orange flame. Self-extinguishes.	Burning hair	Black crumbly ash

Dyeing And Colourings

Dyeing is achieved in a number of ways depending on the fibre being used. The Decision to use a certain fibre will sometimes depend on the desired pattern.

To achieve a pattern that is woven in, as in a jacquard weave, the yarn must be dyed first. To achieve a pattern that is printed onto the fabric, you must select a fibre that will take in dyes or paints after the fabric is woven.

The dyer must select a type of dye that will suit the fibre to be dyed. Most common dyes currently being used are; acid dyes, disperse dyes and pigments. A basic knowledge of dyeing can help you with cleaning and stain removal. For example; primary colours, from which all dye colours are derived, are red, blue and yellow. Therefore, an orange spot on brown fabric may be a loss of blue dye.

The knowledge of colour theory will allow the technician to identify this occurrence and to treat it accordingly.

Methods Of Dying

Solution dyeing

It is a process in which dyes are added to liquid polymer prior to extrusion into fibres. The colour becomes an integral part of the fibre and is all the way through the fibre. It generally produces a very colourfast result. Fibres can be left in continuous filaments or can be cut into staple lengths for blending and carding.

Stock dyeing

It is a process in which a staple fibre has been manufactured and then dyed before it is carded and spun into yarn. Cotton and wool are often dyed using this process, and if a number of coloured fibres are blended and carded together, a multi-coloured yarn can be produced. Tweeds and Berber look fabrics are produced in this way.

Skein dyeing

Yarn is sometimes produced with undyed fibre in bulk quantities to save on costs. This undyed yarn can then be skein dyed in amounts to suit a customer's need, or for a particular run of fabric. Different coloured yarns can be woven together to form patterns such as jacquards and tartans.

Piece dyeing

It is a process that adds dye to fabrics after being manufactured. Fabric is sometimes made from undyed yarn in bulk quantities to save costs. This fabric can then be dyed in selected pieces to suit a customers' need, or for a particular run of fabric. This method can produce only one colour on a piece of fabric unless dye-inhibiting methods are first applied.

Print dyeing

It is a process in which a pattern is printed onto the surface of the fabric. Intricate and colourful designs can be produced in this manner, but it will only work on fibres that will absorb dyes or paints.

Fabrics, Weaves and Textures

A Fabric

A fabric is produced by intertwining yarns of fibre to form a flat sheet which can then be cut into shapes that can be sewn together to form clothing or upholstery coverings.

This is accomplished on a loom. A loom can be a simple wooden frame used for hand weaving, or a large, complex, computer controlled machine weighing several tonnes.

Yarn that runs the length of the fabric or lengthwise are called warp yarn. The yarns that run across the fabric (or 90° to the warp yarn) in the weaving process are called weft yarns.

A Weave

A weave is the way the fabric is put together, to achieve a variety of textures or patterns.

Terms such as plain (basket), satin, jacquard, brocade, brocatelle, velvet, crushed velvet, woven velvet, flocked velvet, velour, velveteen, corduroy, are particular styles achieved by different weaving methods. They can all be woven from a variety of fibres or yarns. Upholstery fabrics are frequently blends of different types of fibres. They can also be mixtures of weave styles. Some sections of a pattern can be made up of velvet weave and some may be flat or satin weaves.

A Texture

A texture is the feel or physical appearance of the fabric. Various combinations of Fibre, yarn, and weaving style can achieve different textures. Textures can be created after a fabric is woven such as in moire fabrics or quilted fabrics.

Cleaning Requirements Based On Weave and Texture

Certain fabric weaves and textures require special cleaning techniques. By understanding different weaves and textures, we can choose the most appropriate cleaning and grooming processes that will achieve the best result

Without causing damage to the fabric's feel or appearance. It is important to remember that it is often the appearance or texture that appealed to the purchaser in the first place.

The responsibility of professional upholstery cleaning technicians is to remove the most soil from the fabric without changing the colour or texture of it.

Characteristics of Weaves and Textures and Their Relationship to Cleaning

There are four basic types of weaves; plain, basket, twill and satin. All other weaves are generally derived from one of these weaves. Weave is a system or pattern of intersecting warp and filling yarns. All types of weaves should be treated with care and can be considered as non-durable, as the weave, due to its construction can be damaged in a process of cleaning.

Plain/Flat/Basket Weave

1. This is the simplest form of weaving.
2. The weft yarn is fed over one warp yarn and under the next, then over the next warp yarn and under the next and so on.
3. If the weft and warp yarns are of the same yarn type a strong flat fabric is produced.
4. By using fine yarns thin, smooth fabric is produced.
5. By using thicker yarns, thicker fabric is produced.
6. This weave is suitable for plain colours, checked striped or tartan patterns. They are achieved by simply loading the loom with different coloured yarns.
7. Fabrics woven with this type of weave are the most suitable fabrics for print dyeing because they are so flat.

8. The surfaces of fabrics are even in appearance and feel.
9. These fabrics are generally easy to clean because the flat weave is evenly tensioned in both directions. It is quite strong and can withstand quite aggressive cleaning without distorting the texture.
10. Plain weaves that require special consideration are weaves where combinations of thick (weft) and thin (warp) yarns are introduced. In this case the texture is not flat. When agitated, the edges of the yarn can be caught and disturbed. Therefore these natural, minimally twisted, cotton yarns should always be cleaned and agitated in the direction of the thicker, filling or weft yarn. An example of this weave is the older style Indian or Haitian cotton.

Satin Weave

1. Many people mistakenly believe that satin is a type of fibre or is a fabric made from silk and that this is the reason for it feeling smooth. The word “satin” actually refers to a type of weave. Usually the fibre used in a satin weave has a lustre or shiny finish.
2. The smooth finish is achieved by altering the weaving style on the loom. Unlike a plain or basket weave, where the yarns go over one and under the next and so on, the yarn in a satin weave goes over a few yarns and under one repeatedly.
3. Satin weave is considered less durable than other weaves and is characterized by the presence of floating yarns.
4. In a satin weave, the surface yarn all ends up running in the same direction giving the fabric its smooth look and feel. The effect can be felt by scratching the fingernail along the fabric and then across it. It will feel smooth one way and rough the other way.
5. The direction of the weave needs to be established for cleaning purposes. Satin weaves should always be cleaned in the direction of the yarn that feels the smoothest.
6. If an upholstery tool is dragged or brushed across the floating yarns (yarn that is not secured by the next weft or warp yarn), you can damage the effect or break the yarn.

Moire

1. Moire is a textured fabric that is sometimes mistakenly called satin because of the shine on the fabric.

2. The surface of moire appears to be a wavy watermarked pattern on a shiny material. This part of the design is impressed on the surface coating material by rollers, heat and pressure. As you move about near the fabric its surface reflects light in different directions giving a cloudy effect.
3. The moire effect can also be impressed directly onto some synthetic fibres.
4. The surface coating is often water-soluble and can be removed by wet cleaning. Dry cleaning only is recommended for this particular fabric.

Jacquard, Brocade or Brocatelle Weave

1. These are the names of weaves produced on a very complex, computer (punch card) controlled machine called a jacquard loom. Jacquard loom is able to create intricate woven fabric usually with elaborate patterns.
2. A pre-set design is “programmed in” and the loom is loaded with the yarns in a predetermined order. The loom brings the colours to the surface of the fabric only where it is required, to form the coloured pattern. When the colour is not required in the pattern it floats on the reverse side of the fabric, out of sight. A raised (brocatelle) or lowered (brocade) pattern can also be created.
3. These weaves can be identified by looking at the reverse side of the fabric. If the pattern on the back of the material appears in reversed colours to the surface yarns, it is a jacquard woven fabric.
4. Jacquards can be woven with different fibres. Some may be colour fast and some may not.
5. They are usually quite thick, as there can be a number of layers of yarn. This can slow drying times, which can lead to colour runs.
6. Different colours can be in close proximity although they may not be seen from the face side of the fabric.
7. Plenty of time should be allowed for pre-testing, as colour runs may not become evident until the fabric is dry. Plenty of times should also be allowed for testing chemicals. It is advisable at times to remove a cushion and take it back to the factory for pre-testing. When cleaning these weaves assisted drying is also recommended.

Velvet, Velours, Velveteen, Corduroy

1. These fabrics have a cut pile design, with the presence of face pile similar to cut pile carpet. Velvet fabric does not refer to the type of yarn used but is considered a type of weave. This type of weave is noted for its soft hand or feel.

2. There are a number of ways to achieve this weave and a number of different textures that can be accomplished. These will affect the depth, softness and durability of the fabric as well as the cleaning approach that needs to be implemented.
3. Velvets can lose pile from normal wear and use. Sweat and soiling can weaken adhesion, or pile fibres, or backing fibres depending on the method of Manufacture or materials used. The fabric should be thoroughly inspected prior to cleaning, mainly identifying worn out and damaged areas, that can be then pointed out to the customer before any work is initiated.

Woven Velvet

1. In woven velvet, the pile is woven in, and is an integral part of the fabric.
2. It can be made from many types of fibres. The fibre in the pile can be different to the fibre in the backing. The pile will usually have a definite lay (or nap). When rubbed, the hand will move freely one way and will meet friction or resistance the opposite way.
3. Most velvet fabrics need to be groomed at various stages in the cleaning process.
4. The pile should be lifted with a carding brush before vacuuming to loosen soiling.
5. When cleaning velvet upholstered furniture made with natural pile fibres groom the pile immediately after extraction of each section. A carding brush can be used to set the nap in the direction of the lay of the pile to remove tooling marks. However, should the carding brush leave brush marks then a folded clean dry nappy can be used to set the nap. DO NOT a carding brush on flocked velvet as it can cause permanent damage
6. After cleaning and setting the nap, and in the very last stages of drying, the pile should be brushed with a velvet fluffing brush to fluff and soften the pile. If it is not done, the fabric can end up feeling hard and scratchy. Following the cleaning with the water-based solution of all velvet upholstery, (made of either natural or synthetic fibres) the pile will have to be brushed.
7. The extra grooming required will add considerable time to the job and should be explained to the client and allowed for in job costings.

Crushed Velvets

1. A crushed velvet fabric is one that has a random, intentional distortion of the pile. This effect is achieved under hot moist (steamy) conditions, which sets the pile in different directions.

2. Hot water extraction of crushed velvet re-creates those conditions and can and generally will remove the random crush.
3. "Dry cleaning" is the recommended process but soil removal may not be as good as with wet cleaning.
4. The customer should be advised about the pros and cons of wet and dry cleaning. If the customer decides to wet clean this type of weave, then it is recommended for the disclaimer form to be signed by customer prior to starting the job. This form should incorporate all side effects of wet cleaning, primarily the loss of the crush, and customer acceptance of this occurrence. It is also recommended to advise the customer that crushed velvet upholstery should be cleaned more frequently with the dry cleaning process, to reduce soiling build up.
5. Crush can sometimes be partially restored by patting the fabric dry with a scrunched up piece of towelling.

Please note; the crush in crushed velvet can be worn off and may not be restored using any cleaning process.

Flocked Velvets

1. Flocked velvet is a special case. It is important to be aware of it as it can be easily damaged in the process of cleaning. Pile in flocked velvet is attached to a backing fabric with a glue (similar to fusion bonded carpets). If the glue gets damaged the flocking can easily be removed, thus causing damage to the appearance of the fabric.
2. Solvents of any kind should not be used as they can cause damage to the glue.
3. Detergents, spotters or cleaning agents should be used with care and only after careful and thorough pre-testing as they can also cause damage to the glue.
4. Over aggressive agitation or extremes of temperatures may also cause damage to the glue.

Quilted Fabrics

1. Fabric with three layers sewn together in a stitched pattern, which creates raised areas, is referred to as a quilted fabric. It adds a third dimension to an otherwise flat fabric or pattern. It is similar to a sandwich effect where two layers of fabric, separated by a soft filling, are sewn together. The sewing is often done in stripes or squares and is usually close together to avoid too much puckering or folding of the filler. Sometimes the sewing will follow the lines of a pattern in the fabric to add a three dimensional, puffy effect to the pattern
2. It is important to check the backing fabric as well as the face fabric for colour run.

3. It is important to check that cleaning agents do not affect the filling material.
4. In addition, it is important to check the stitching that makes the quilted effect for signs of pulling. Care should be taken while cleaning that stitching is not disturbed.
5. Assisted drying is recommended due to the thickness of the overall layers of fabric.

Twill Weave

A fundamental weave characterised by diagonal lines produced by a series of floats staggered in the warp directions. The floats are normally formed by filling. Filling yarn can be any yarn running across the width of the fabric perpendicular to the warp yarn.

Novelty Yarn

A yarn produced for a special effect. Novelty yarns usually have interwoven irregularities. The finished fabric will determine the type of fibres that are required and the way the fibres are spun together to form the yarn. For example, to achieve a smooth shiny finish, we would need to use a smooth fibre and spin it into a very tight yarn, which we can then weave into smooth flat finish, like satin. If we want a multi-coloured or textured finish we could use a multi-coloured or multi-textured (novelty yarn), which is made by spinning together different types and colours of yarn in more random pattern. Novelty yarns are made of core, effect and binder yarns. When it is woven into a fabric it produces a variety of coloured and texture effects such as chenille, boucle and ratine.