ELECTRODRY GROUP

Carpet Cleaning Manual

- Dry Cleaning (Maintenance)
- Steam Cleaning (Maintenance)
- Dual Cleaning (Restorative)

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Company Profile

Electrodry Group was founded by Paul & Margaret Burchell in 1983, and has been trading for over 30 years. With franchises all over Australia, Electrodry is known as the largest professional carpet dry cleaning company in Australia.

Electrodry is the only professional carpet cleaner in Australia that is approved by the sensitive choice program of the National Asthma Council.

Electrodry is the most trusted name in professional carpet cleaning – this has been achieved by projecting an identity that speaks confidence into our audience about our services.

Electrodry Group offers the following services:

- Carpet Dry Cleaning
- Healthy Mattress Cleaning
- Leather Cleaning
- Carpet & Upholstery Sanitation
- Tile & Grout Cleaning
- Drape & Blind Cleaning
- Air Conditioner Cleaning
- Air Correct Treatment
- Fire & Water Restoration
- Mould Cleaning
- Car Care

Electrodry is a brand committed to improving the health and comfort of Australian families - we are more than just carpet cleaning.

Disclaimer

the information provided in this document is likely to change without notice. The policies outlined within are controlled in their entirety by Electrodry Head Office and take into account many factors that may not be apparent to all stakeholders.

Whistle & Co. 1979 Pty. Ltd. (trading as Electrodry) acknowledges that the content within provides policies and procedures that pertain to the interests of internal and external stakeholders. These policies and procedures provide a written definition of activities that Electrodry considers acceptable practice and is in compliance with legal requirements.

Contents

Acknowledgement

Electrodry Carpet Dry Cleaning acknowledges a major part of this work was contributed by Jena Dyco Intl, Melbourne, Australia.

We thank Jena Dyco for their continued support and invaluable assistance.

Disclaimer

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Introduction to Fibres

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

Staple filament is a relatively short fibre, either natural or synthetic, which is twisted into yarn. They range in length between 9 and 15 centimetres. Staple filament has to go through a blending and carding process before it is spun into yarn.

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 (natural fibre).

Fibres can be separated into two categories: **Natural** and **Synthetic**

Natural Fibers

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. These include cotton, jute, and sisal. These fibres are subject to true cellulosic browning. Fibres produced by insects or animals are referred to as protein fibres. These fibres include wool, hair and silk.

Natural fibres have several characteristics in common:

- They tend to shrink when wet
- They absorb moisture and soils
- As the result of their absorbent qualities they require extended drying time
- They are brittle and break off easily
- They burn to ash when exposed to a flame

Animal (PROTEIN) Fibres are always staple except for Silk.

Wool

- Wool is a natural fibre obtained from the fleece of sheep, lamb, goats, camels, etc.
- It is the oldest fibre, dating back to over 2000 BC.
- It is considered to be the finest face fibre. It is a very popular fibre used for carpets in both Australia and New Zealand and is the dominant fibre used for carpets in New Zealand.
- The fibre construction consists of the epidermis, cortex and medulla.
- The fibre has natural flame resistance. It will not support a flame when subjected to burn test
- When exposed to a flame it smells like burning hair
- It is resistant to damage by mild acids

- It is easily destroyed by alkaline substances. Use of high pH (over 8.5) chemicals can cause a problem of degradation of the fibre/yarn
- According to Wools of New Zealand, the safe pH range for cleaning wool carpet is 4.5 - 8.5. It has excellent soil hiding characteristics
- The fibre is flexible, strong and resilient. This is mainly due to the fibre's natural crimp characteristics.

Silk

- Used mostly in loose rugs and upholstery or clothing fabrics
- It has high lustre which adds beauty to the carpets
- It is a very strong fibre, making it one of the most durable and easy to clean natural fibres
- It is very strong compared to the other natural fibres and has good elastic properties
- It is a very absorbent fibre

Plants (CELLULOSIC) Fibres are always staple.

Cotton

Cotton fibres grow from the seed of the cotton plant (Gossypium) and range in length from 1 to 4 centimetres. Each seed has many fibres, or hairs growing from it. Cotton is not a common face yarn fibre used in carpets today. It is a very absorbent fibre, holds large amounts of water and thus requires maximum drying time. It is subject to true cellulosic browning

Jute

- A natural cellulosic fibre made from certain plants of the linden family
- It is used mostly as primary and secondary carpet backing.

Sisal

- Sisal is a naturally occurring fibre that is obtained from the three-foot leaves of the Agave plant.
- It is a lustrous, durable, fairly elastic bast fibre
- It is used as a face yarn fibre

Synthetic fibres are the result of chemical synthesis - the combination of two or more chemicals to produce a third compound which is significantly different from the original components. Synthetic fibres include nylon, polypropylene (olefin), acrylic and polyester.

Synthetic Fibres

Fibre Production/ Extrusion Process

- All of the synthetic fibres begin as liquids. The liquids are called polymers. A polymer is a mixture of two similar solutions that have different weights. If pigment is added at this point the filaments will have colour, and the filament will be called "SOLUTION DYED". This type of dying process has incredibly good "colour retention" characteristics.

- Polymers are pressed through the tiny holes of a spinneret out of which the fibres are formed. This step gives the yarn its shape, or "CROSS SECTION" as well as its thickness, or "DENIER". Denier is a yarn count unit. It is the weight in grams of 9000 meters of the filament. Denier is a direct yarn numbering system, higher denier, means a thicker yarn.

- As soon as they leave the spinnerets they are hardened by passing through dry warm air, cool air or through liquid bath. "DYE SITES" are formed during this step. These are irregular, amorphous shaped areas which receive the dyes.

- At this point fibres are perfectly straight and are not suitable for spinning. In order to spin the yarn, and have them stay spun, the fibres must be crimped.

- Heat setting follows, during this process a new polymer “memory” is created by the application of extreme temperature to yarns. The temperature goes up to 220°C in a SEUSSEN system. This newly created "memory" helps the yarn to retain its crimping, bulking, and twist.

- Next step is Spinning the filaments into bundles of yarn. If only one bundle of yarn is used to make a tuft it is called a "single" yarn. If more than one bundle is used it is called a "plied" yarn.

There are three methods of fibre spinning:

Wet Spinning	**Dry Spinning**	**Melt Spinning**
The raw materials are dissolved by chemicals and pumped through a spinneret. They emerge as filaments into an acid bath. The fibre solidifies when coagulated by the acid.	The resin solids are dissolved by a solvent and pumped through a spinneret. They emerge as filaments into warm air. As the solvents evaporate, the fibres solidify.	The resin solids or polymer chips are heated, and then pumped through the spinneret. The emerging strands are cooled and hardened by air blown across them.

Polyester

Polyester entered the carpet industry in the 1960’s. It has a hand and appearance similar to nylon. Technically, it is a complex ester formed by polymerisation.

- It is mainly made as staple in order to give the fibre its particular texture.

- This fibre is highly recyclable and is frequently manufactured from recycled materials (e.g. plastic beverage bottles)

- It has very good bulk.

- It is a very colour fast fibre that resists damage by sunlight. It is usually dyed by using "disperse" dye.

- It lacks resiliency.

- Susceptible to abrasion.

- It is low in cost

Acrylic

Acrylic fibre is made from a long chain of synthetic polymer composed of at least 85% by weight of acrylonitrile, which is a liquid derivative of natural gas and air. The fibre appeared on the market in 1949.

- Available only as staple filaments
- The spun yarns have the closest resemblance to wool of any man-made fibre and is most “wool-like” fibre of all synthetics
- It is non-absorbent
- Very susceptible to abrasion
- Does not maintain its appearance over the years, as it is not very resilient
- Hand coarsens with age
- Smells acrid, like burnt meat, when exposed to flames

Polypropylene (Olefin)

Polypropylene is a long chain synthetic polymer composed of at least 95% by weight of propylene and may be modified by adding several percent of another olefin. Polypropylene has large crystalline regions and very small amorphous regions making it highly water resistant. The fibre is used for conventional carpets as well as indoor/outdoor carpets. It is also used in the manufacturer of man-made backing.

- Made either as staple or continuous filament
- Least water absorbent of all synthetic fibres
- Does not shrink
- Not resistant to oil
- Has low resilience.
- Has good stain resistance, except with oil.
- Has light weight, floats on water
- Has lowest melting temperature, very temperature sensitive
- "Solution dyed" during extrusion process
- Low in cost

Nylon

Nylon is a thermoplastic long chain polyamide fibre which contains amine groups that carry a positive charge. Each of these amine groups have the ability to react with molecules of negative charged acid dyes. The more amine groups the nylon has, the more dye molecules it can attract, and

thus the fibre can be dyed to a dark colour. Nylon molecules have a characteristic appearance of non-porous crystalline areas with the presence of porous amorphous areas that act as dye sites. Since nylon is a man-made fibre, it can be made as thick or thin as desired. The thicker the fibre the more durable it is. Nylon is the most popular of all synthetics fibres.

- Made either as staple or continuous filaments
- Soft, bright and strong fibre
- Has excellent resistance to abrasion
- Quite a resilient fibre. Most resilient of all synthetics
- Man-made fibre it can be made as thick and thin as desired
- Most nylon fibres are dyed by using acid dyes
- Resists strong alkaline, mildew and heat
- Easily damaged by application of bleach materials and sunlight
- Susceptible to fading caused by fumes

Nylon was first introduced as carpet yarn in the mid-1950. Over the years Nylon has been "altered" several times.

"First Generation" Nylon	**"Second Generation" Nylon**	**"Third Generation" Nylon**	**"Fourth Generation" Nylon**	**"Fifth Generation" Nylon**
Yarns performed well, but magnified soil causing rapid apparent soiling of fibre	Yarns are either delustered or have an altered cross section to improve "soil hiding" ability of the fibre	Yarns have a built-in static control. Since nylon produces very strong static, especially in low humidity situations, it was felt that this development Was necessary to facilitate the product's acceptance in the marketplace.	The Fourth Generation refers to the Nylon that has had fluorochemical applied to it. Fluorochemical helps to repel soil, oil and water-based stains by lowering the surface energy of the fibres.	Additional property in-build into the yarn. The Nylon in the Fifth Generation has been treated with an anionic dye blocker or acid dye resistor to resist stains from common household food and beverage substances. The acid dye resistors act like colourless dyes.

- Acid dye resisters, which act as clear colourless dyes, are applied to "pack" the dye sites to prevent penetration of staining substances (common household food and beverage substances) into the dye sites.
- Fluorochemical protectors such as Scotch guard or Teflon are then applied to the yarn.
- These treatments lower the surface energy or tension of the yarns to enhance soil releasing characteristics of the fibre and to add oil and water resistance to the carpet.

Warranty for DuPont Certified Stain master Carpet

- Applies to residential installations only
- Resists stains created by common household food and beverage substances only. Examples include soft drinks, cordials, red wine, etc.
- Specifically excludes stains created by such products as mustard (disperse dye), hot tea or coffee, blood, vomit, urine, faeces, bleaches, plant food; drain cleaners, non-food substances, non-beverage substances.
- Technicians are instructed never to make any warranty statements to consumer on behalf of the fibre producer unless requested to do so by a fibre producer.
- Application of cationic agents will void the warranty

Recommended Spot/Stain Removal Procedure for DuPont Certified Stain master Carpet

- Only approved chemicals should be used (no pH over 10; no cationic chemicals should be used)
- Following application of chemicals the area must be rinsed well - to ensure removal of all cleaner/spotter residues.
- Technician should attempt spotting of common household food and beverage substances only after overall cleaning has been completed.

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

Store chemicals securely in correctly labelled appropriate containers.

- Containers used on site should be correctly labelled
- All material safety data sheets (msds) must be available wherever chemicals are being used or carried (vehicle, on site, factory)
- Carry and use protective equipment such as chemical resistant gloves, respirators with appropriate filter cartridges and eye protection.
- Dispose of waste and unused chemical properly in accordance with local regulations as per Australian and New Zealand standards
- When mixing chemicals for cleaning upholstery always read the label of the container and mix chemicals according to the manufacturer's directions
- Always read labels and observe safety considerations
- Never mix chlorine bleach with ammonia as it creates ammonium gas, which is poisonous
- Do not sniff chemicals or containers to find out what it is. If in doubt, throw it out
- Wash your hands well after handling any chemicals or containers with chemicals
- Avoid skin contacts with chemicals. Acids and alkalies can burn the skin

- 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
- 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
- Always cap your chemicals immediately following their use
- Never leave any chemicals unattended
- Ensure that children or pets do not have access to the area while chemicals are being used

Solvents Chemical Safety

Always store in properly labelled, manufacturer approved containers

- Wear protection as required
- When dry cleaning fabrics using an extraction system it is important to use personal protective equipment designed for use with specific solvents
- 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
- Disposal of dry cleaning solvent should be done at an approved solvent disposal site and/or in accordance with local laws
- Do not over-heat solvent as solvents are combustible (can explode)
- 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
- 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

Have all electrical equipment regularly checked and serviced. Inspect power cords for wear, fraying or other damage

- All electrical equipment that is not marked as being double insulated, should be properly earthed (grounded)
- Use an earth leakage protection device and check all power points are earthed
- Never disconnect safety features on equipment
- Do not allow electrical cords or plugs to become wet
- 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)
- Disconnect power cords from sockets before doing any maintenance on your Equipment
- Disconnect electricity before filling equipment with water

Site and Personal Safety

Arrange equipment so that it is out of traffic ways

- Arrange hoses and power cords so that people cannot trip
- Always ask people to keep children away from the work area at all times
- 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
- Keep spotters under cover and under strict supervision at all times
- Use drop sheet to help prevent slippery floors
- Post caution signs to warn customers that floors may be slippery and give verbal warnings as well
- 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)
- Use correct lifting techniques to avoid back injury

Fibre Identification

Methods of Identification

There are basically three ways in which fibres may be identified.

Visually

This method is the least accurate and should not be relied on

Burn Testing

It is a simple test to determine carpet's fibre content for the purpose of carpet cleaning. It is not a reliable test for fibre identification of the content of the carpet prior to any dyeing processes. With the burn testing of fibre the flame, smoke, odour and ash should be carefully observed and noted. It is recommended not to use matches; it is advisable to use butane lighter as flame for the burn test, because it produces the odourless flame and therefore does not interfere with the odour of the fibre.

- Flame should be observed for its nature and its action
- Presence or lack of smoke associated with burning, or lack of it should be noted
- Odour of the burnt fibre is very important
- Ash should be noted
- Ash from Synthetic fibres is hard and crusty
- Ash from Natural (protein and cellulose) fibres is soft and crumbly

Chemical Test

This test is the only accurate test for identifying nylon and wool and mixtures of nylon and wool. It is the only test that is suitable for identifying the fibre prior to any dyeing processes.

Safety Note:

- Make sure all solutions are capped
- Wear protective gloves when handling solutions
- Do not inhale fumes
- Use forceps to remove fibre from solutions
- Use correct procedure for disposal of excess solutions remaining in the test bowls

Nylon dissolves quickly in Formic Acid

Olefin floats on water - specific gravity less than water

Wool is dissolved slowly by sodium hypochlorite which is commonly known as chlorine bleach

Acetate is dissolved by Acetone

Chemical Tests and Burn Tests for Fibre Identification

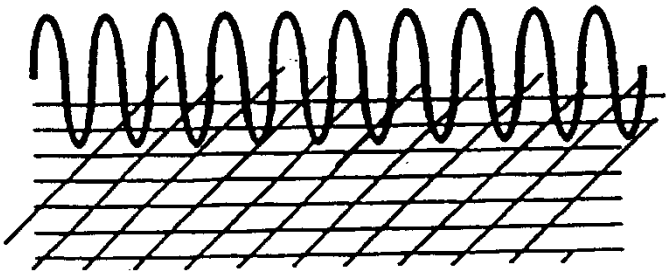
Fibre type	**Flame colour action smoke**	**Odour**	**Ash: shape colour hardness**	**Chemical test**
Wool	Orange; Sputters Flame extinguishes itself	Burning hair	Irregular; Black; Crumbles easily to a fine powder	Dissolves slowly in chlorine bleach (5-10 minutes)
Nylon	Blue base, orange tip; even flame; Puff of white smoke when extinguished	Celery; Sealing wax	Round bead; grey/brown to black; hard	Dissolves rapidly in formic acid
Cotton	Yellow/ Amber; fluffy ash	Burning paper	Grey powder ash	No practical field test
Polyester	Orange; heavy black smoke	Sweet; over ripe fruit	Rounder; shiny; Black; hard	No practical field test
Acrylic	White-orange Heavy black smoke	Harsh; Acrid; Burnt meat	Irregular; Black; Crusty hard	No practical field test
Polypropylene (olefin)	Blue base; Orange tip; Even flame; Fast burning; No smoke	Asphalt or burning paraffin	Round bead; Light grey to black; Hard	Floats in water Most other fibres sink

Carpet Construction

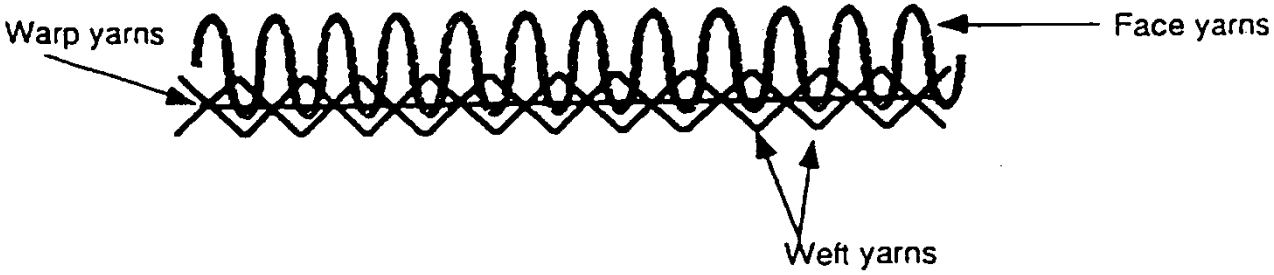
Woven Carpet

'Woven' refers to a carpet or rug that is made through the process of weaving. The front and back of the woven carpet are formed at the same time. It is made on a loom and is done by interweaving (intertwining) three or four sets of yarn together: warp yarn (yarn that runs lengthwise), weft yarn (yarn that runs across the width of the carpet) and face yarn or pile yarn (yarn above the backing; this is the part walked on; it is referred to as the nap of the carpet). Woven carpet may also include stiffer yarns running in a lengthwise (warp) direction in order to increase the bulk, strength and weight of the weave. Woven carpets and rugs are slower and more expensive to make, but they can usually withstand far greater traffic and wear than tufted carpets.

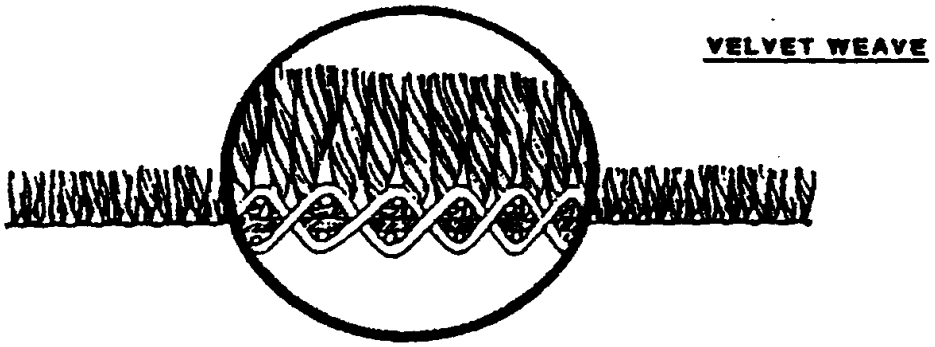
There are many variations of woven carpet, all based on one of three types of weaves: Velvet, Wilton and Axminster.



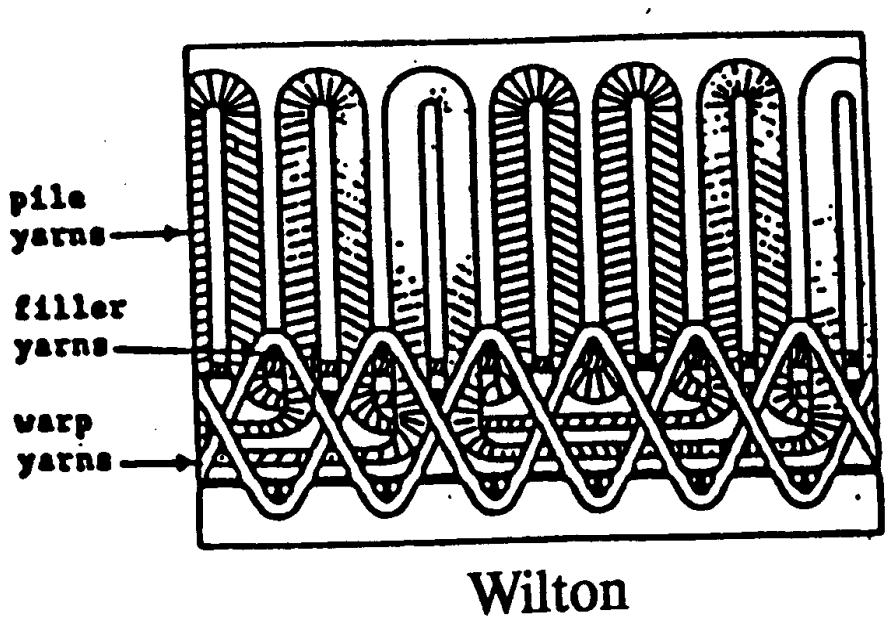
WOVEN CARPET



Velvet Weave is ordinarily used to produce extremely dense plush velvet piles. It is a relatively simple weave. During finishing, the pile is brushed aggressively to open up (untwist) the pile yarns to produce the velvet texture for which this weaving process is known.

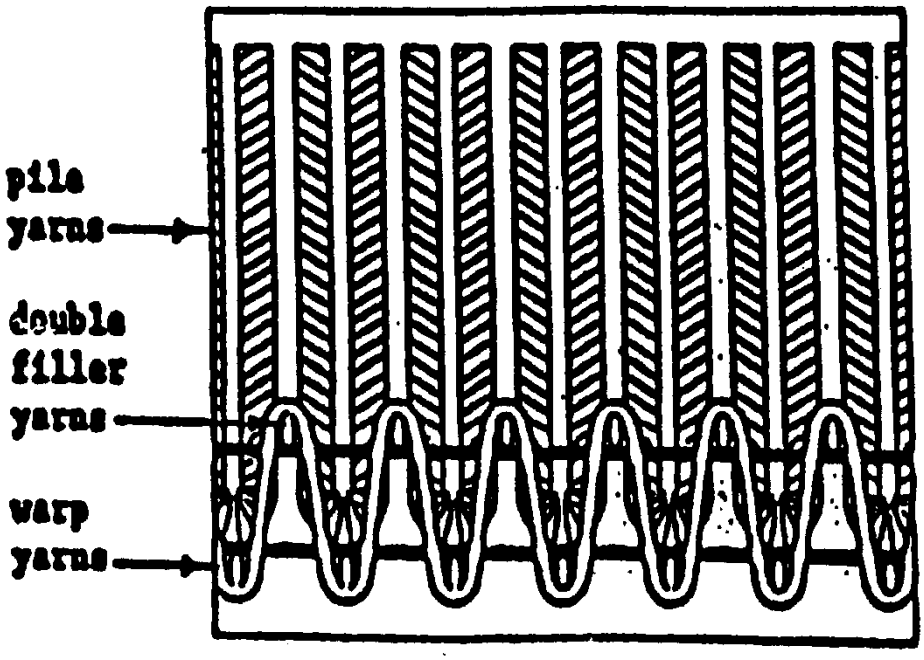


Wilton is a more complex weave. Wilton carpets are produced on a rather complicated Jacquard loom - a machine producing woven carpets. Wilton carpets are the most expensive of all woven carpets. They come in loop and cut styles. Wilton carpets are also quite flexible, very strong, resilient, long wearing carpets.



Wilton

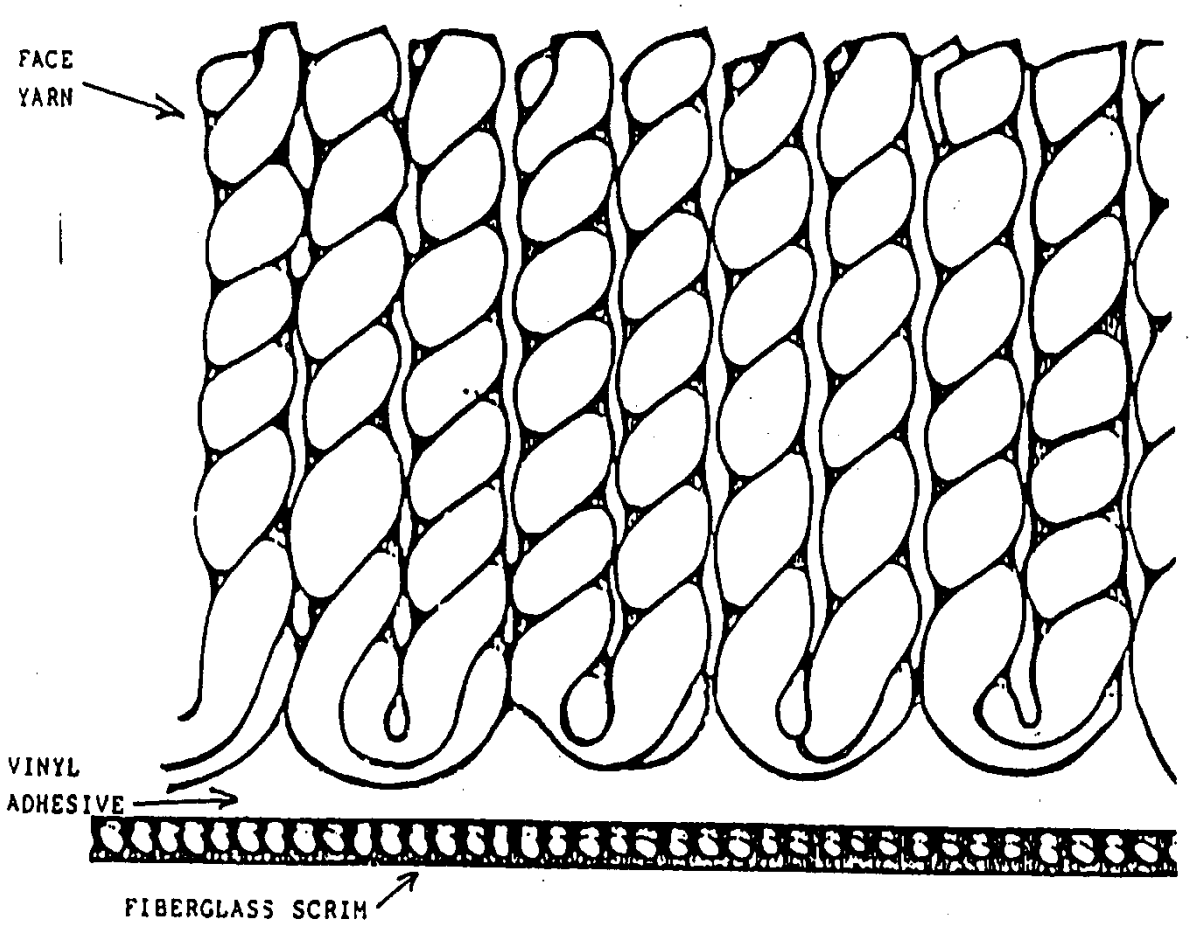
Axminster carpets are always made in a cut-pile configuration only. They are noted for their intricate colours and designs. Axminster is woven on a highly sophisticated loom. Axminster carpets are easily identified by the distinctive ribbed appearance of their back, and the absence of secondary backing. Axminster carpets are known for their ability to be rolled and stretched in a lengthwise direction only. Cleaning and dyeing technicians should take extreme care not to over wet Axminster carpets as width wise shrinkage is almost impossible to restretch back into position.



Axminster

Fusion Bonded

Fusion bonded carpets are produced by implanting the face yarns directly into a liquid vinyl or rubber that also forms the backing. It allows the yarns to be more closely packed than in either weaving or tufting processes, resulting in extreme density of fibre. Fusion bonded carpets can be either cut or looped pile. This process is used extensively in the manufacture of carpet tiles (module).



Needle Punch

In this process the thick layers of fibres are "punched" down, or compressed, to "wear surface" of carpet. This carpet does not have pile, or nap, as we commonly know it.

Tufted Carpets

Most carpets manufactured today are tufted carpets. In the production of tufted carpets - yarns are stitched into a backing material to form loop-pile, cut-pile or cut and loop pile carpet. Tufted carpet construction consists of face yarn and primary backing, adhesive and secondary backing. The first production process is to sew the face yarn into a material, usually thin, known as the primary backing. Face yarns consist of a broad range of fabrics; they can be wool, nylon, wool/nylon blends, polypropylene, acrylic, wool/acrylic (rarely), polyester, etc, in various pile constructions. Primary

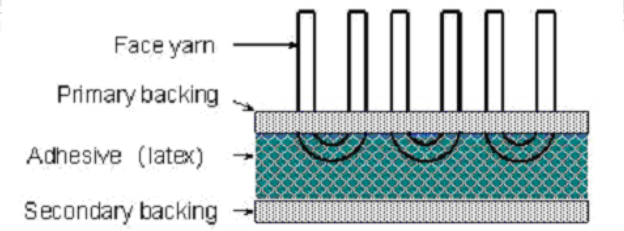
backing consists of woven or nonwoven fabric into which face yarn tufts are inserted by the tufting needle. The most common fibre used for primary backing is polypropylene.

Carpet which has been tufted into a primary backing, but has not been dyed and does not have a secondary backing is called “Greige goods”. The tufted “Greige goods” must be further processed before they become the final product. They must be dyed, and the partially constructed carpets must be subjected to a further series of processes known as ‘finishing’.

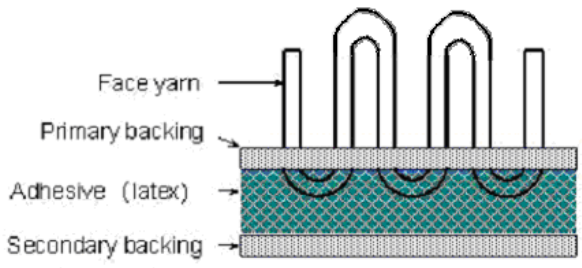
In the finishing process a heavy coat of adhesive is added to the back of the primary backing to lock in the tufts into place. This application usually occurs simultaneously with the application of a layer of latex to the secondary backing in order to provide more durable bonding to the primary backing during lamination. The secondary backing is then laminated to the primary backing. The secondary backing can be made out of jute natural material), woven polypropylene or non-woven polypropylene (synthetic material). Secondary backing provides ‘dimensional stability” or the capability of the carpet to retain its size or shape. It also improves the attractive appearance to the final carpet. In some cases it is made to resemble the back of more expensive woven carpets.

In place of secondary backing, carpets can also be unitary backed or underlay backed (foam). In unitary backed carpets there is no secondary backing applied, but an application of a special latex compound gives tufts a strong bind. These carpets are designed for direct glue down installation. When underlay-backed carpet is made, a coating of high density foam or urethane is applied in place of the secondary backing.

The final steps in finishing involve fluffing or expending the pile yarn by injecting dry steam and then subjecting the carpet (in the case of cut pile) to a final shearing and vacuuming procedure to ensure a smooth surface and an even colour throughout the carpet. Topical agents, such as fluorochemical protectors, static control agents or antimicrobial agents are also applied at the end of the carpet production finishing procedure.



TUFTED CUT PILE CARPET



TUFTED LOOPED PILE CARPET

Types of Carpet Pile Designs

There are three major categories in the design or texture1 of carpet pile: Cut-Pile Design, Loop-Pile Design and Cut and Loop Pile Design.

Cut-Pile Design is where the face of the carpet is composed of individual, levelled cut pieces of yarn. Different examples of cut pile design are:

- Saxony or "Saxony Plush"

The main characteristic of this design is that the pile is made up of twisted, high-level carpet designed for residential use

- Velvet Plush

This is a cut pile design made from a plied yarn which has not been twisted and/or heat-set.

- Shag

This design refers to carpet with a cut pile height of greater than two centimetres. The pile height, together with its low density creates a casual, random-lay effect where the sides of the yarn are exposed to foot traffic.

- Splush

This usually refers to a cut-pile design which has characteristics between that of shag and plush. The height of the pile is shorter than in shag while the yarn is almost as dense as in plush.

- Frieze

This design is made of tightly twisted cut yarn with different degrees of twist. The heat used to produce this design sets irregularities into the yarn, producing a rough appearance of the carpet pile. This design results in traffic exposure to both the tips and sides of the yarn.

Loop-Pile Design refers to a carpet style where the pile surface consists of uncut loops. There are several types of loop pile designs:

- Level loop pile consists of uniformly level tufts in an uncut or loop pile configuration. Loops are all one height.

- Multi-level loop pile designs, also known as "high-low" pile carpets, are formed by increasing and decreasing the tension on the yarn during tufting. This produces a pattern with both high and low loops.

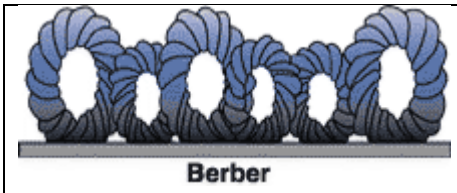
- Berber designs are basically level loop designs, except loops in this design are usually big and fat. Originally made of wool, this carpet is frequently associated with wool in the customers mind, but can also be made of nylon or other synthetic fibres.

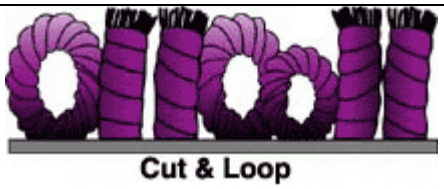
[1] Texture relates to the appearance of the carpet as viewed from the surface

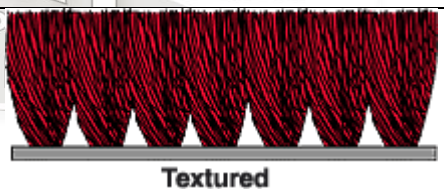
In general, loop-pile carpets have less face fibre than most plush and Saxony carpets thus showing signs of wear more readily.

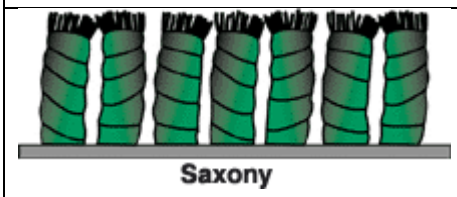
Cut and Loop Pile Designs refer to styles that include elements of both cut and loop pile design. This design is also known as cut and loop, or sculptured design. It consists of higher cut pile yarns and lower loop pile yarns. It is usually made from nylon fibre.

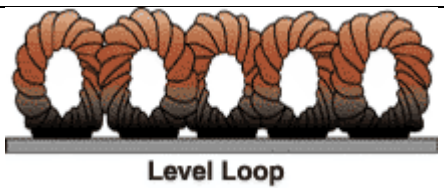
Examples of Typical Carpet Styles











Common Terms Used to Describe Fibre's Characteristics

Delamination is the separation of the secondary backing of the carpet from the primary backing. This problem may be caused by heavy traffic, too-soft underlay, or by the carpet being wet for an extended period of time. If it occurs in newer carpets it is generally related to improper formulation or application of the latex which is designed to bond the primary and secondary backing.

Face Fibres are the yarns which are on top of the carpet and actually make up the wear surface, the face of the carpet. Also called the NAP or the PILE.

Lay refers to the tendency of pile tufts or loops to lean or lay in a certain direction

Pooling which is also referred to as water-marking, nap reversal or shading, describes distortion which develops in the surface of cut-pile carpet. It involves random areas of "reversed pile" throughout the carpet resulting in dark and light areas. It actually looks as if the carpet is wet in some areas or there is an apparent change of colour in carpet pile caused when light is reflected in different ways as fibres are bent. This is described as a characteristic of cut-pile carpets. Usually the higher the density of the face yarns the higher the likelihood of pooling.

Ripples are usually related to poor stretching of carpet during installation. Ripples may sometimes appear during or after cleaning. In this case it is best to do nothing with the carpet, as far as correction is concerned, until humidity stabilises (5 to 7 days after cleaning has been completed). The customer should be informed of the occurrence, reassured and advised to wait till the carpet is completely dry, as it generally settles at this stage.

Shedding is the releasing of relatively short, loose fibres from the carpet pile. These fibres consist primarily of unsecured staple fibres and residual lint resulting from the shearing process.

Wear is defined as the diminishing of the face of yarn as a result of external abrasion. Reduction in the amount of face fibre in traffic areas, especially when compared to non-trafficked areas

Dyeing Methods Used In the Manufacture of Carpets

Several surveys have shown that a major criteria in the selection of a carpet is based on the colour of the carpet. This explains the many different colours and colour combinations seen in the market place. Many of the different colouring effects are produced by using fibres that are manufactured to accept different types of dyes in various amounts, in conjunction with one or several dye systems.

Dyeing methods are classified into two categories: Pre-Dyed Processes in which colour is added to the fibre or yarn before the carpet is manufactured and Post-Dyed Processes in which the colour and pattern is added after the carpet has been manufactured.

Pre-Dyed Processes Used By Manufacturers:

Stock Dyeing

This is one of the methods used to dye wool and staple synthetic fibres before they are spun into yarn. The heated dyes are circulated under pressure for several hours through batches of uncoloured fibre. The fibre is then removed, set with steam and cut into stable lengths (usually about 13 centimetres). Before the fibre is ready to be spun into yarn, the staple length fibres are combined several times to insure that there is uniform colour throughout the batch. It is finally washed and dried.

Skein Dyeing

This process is very similar to raw stock dyeing, except that the fibres are dyed after being spun into yarns but before being converted to carpet.

Package Dyeing

This process is similar to skein dyeing, except that the fibres are made into multiple yarns prior to it being dyed. The fibres are dyed after being spun into yarns but before being converted to carpet.

Space Dyeing

This method is used to produce a large percentage of continuous filament nylon commercial carpeting. A special machine applies two or more colours to the yarn at certain intervals prior to the yarn being tufted. Colours are applied in an irregular manner to yarns to provide a random multi-coloured effect on the finished carpet.

Solution Dyeing

This process refers to the dyeing of man-made fibres. In this process the pigment (colour) is added to the liquid polymer prior to extrusion of the fibre/filament. This process of solution dyeing produces extreme colour fastness. This is because the gases and chemicals are unable to contact the dye itself, as it is inside the fibre. The fibres in solution dyeing are mostly dyed using disperse dyes.

Post Dyed Processes Used By Manufacturers

Beck/Piece Dyeing

This process is also called ‘beck dyeing’ or ‘vat dyeing’. It refers to the application of dyes to greige goods. The ends of the carpet are sewn together and the carpet is immersed in a boiling dye solution and agitated to promote complete penetration of dye into the fibres. Piece Dyeing is one of the most popular post dye processes

Continuous Dyeing

In this process the carpet is spread flat and run down a large processing line. The dyes are sprayed directly onto the surface of the carpet. Then the carpet proceeds into a large steam chamber where the setting of the dyes takes place. This process is also quite popular due to its high volumes of production.

Differential Dyeing

During this process yarns on tufted carpet are treated chemically prior to dyeing. This is done so that when the carpet is placed in a dye bath each yarn will react differently to the dye, producing various shades of the same colour.

Print Dyeing

During this process dyes are applied directly to the surface of the carpet in the form of a pattern. After the carpet is tufted, the pattern, which can have up to six colours, is sprayed on silk and screened into place.

Screen Printing

During this process dyes are applied directly onto the surface of the carpet in the form of a pattern.

Main Types of Dyes Used

If dyes were grouped as to their chemical structure, there would be over 30 different classes of dyes. It is more simple to group the dyes by their method of application. Below are some commonly used groups of dyes.

Acid Dyes

Made from organic acids, Acid Dyes are commonly used for dyeing wool and nylon carpets. Acid dyes are anionic (they have a negative charge) with a relative low molecular weight. They attach themselves to the fibre of the carpet by using acidic bonds.

Disperse Dyes

These are non-ionic dyes (no electrical charge), and have very low solubility in water. Disperse Dyes are held onto fibre surfaces by friction and strong electrical forces, and are mostly unaffected by cleaning chemicals.

They are mainly used for acetate, polyester and other synthetic fibres.

Direct Dyes

These are water soluble dyes, which use physical entrapment mechanisms to dye the fibre. Usually direct dyes are used for dyeing cellulosic fibres.

Azoic Dyes

Azoic dyes are used for cottons. These dyes are applied in two steps. The fibre first treated with a coupling component, and then the diazo component is added. Azoic dyes have good wash fastness.

Basic Dyes

Basic dyes were the first synthetic dyes developed from Perkins accidental discovery of dyes in 1856. They are known more for brightness of colours rather than colourfastness.

Reactive Dyes

Reactive dyes undergo a reaction with the fibre and form a covalent bond that results in good light and wash fastness. They are not resistant to chlorine bleach.

The type of dye needed for colour repair work should be chosen depending on the carpet's fibre type. To permanently repair wool and nylon fibres, acid dyes should be used. Other dye types will not produce permanent results on wool and nylon fibre, as these dyes are not light-fast and can be easily washed out or rubbed off. Mixtures of dyes of different colours often produce different results than mixtures of paints or pigments due to the fact that paints and pigments are opaque and dyes are transparent.

Dye related problems may develop as the carpet is exposed to traffic and/or atmospheric conditions.

BLEEDING is the migration, or movement, of dye or pigment in the presence of liquids and subsequent staining of areas adjacent to the wet area or other materials in contact with the wet area.

CROCKING is a term used to describe excess colour rubbing off as the result of

The physical movement, or removal, of dye or pigment due to wet or dry agitation

SUN FADE is loss of colour as the result of carpet being exposed to direct sunlight.

FUME FADE is the loss of colour as the result of various gasses passing over the surface of the carpet.

COLOUR CHANGE is an actual change in the colour of the dye, possibly due to the effects of pesticides. If caused by pesticides the discoloration will normally be located next to the baseboards. COLOUR CHANGE may also be caused by the presence of an INDICATOR DYE, or dye which changes colour when the pH is changed.

Carpet Installation

Methods for Installation of Carpets

Loose Laid

Carpet is not attached to the floor, therefore there is no guarantee against shrinkage, rippling, wrinkling or bulging.

Stretch-In Over Underlay

Smoothed or tackles strips should be installed along the walls of the area

Underlay should be secured to the floor

Carpet must be stretched according to Australian Standards - when over 7 metres, carpet should be power stretched

Glue Down

Carpet directly glued to the floor

Double Bond

Underlay glued to sub-floor

Carpet glued to underlay

UNDERLAY or CUSHION is used under carpet to provide a softer surface on which to walk and helps the carpet resist matting and crushing.

Carpet Cleaning Methods

By definition, the purpose of carpet cleaning is to remove soils. As carpet, being on the floor, acts as a filter for soils, gases, animal or human dander, and numerous other materials it is imperative that it should be cleaned for health. However, most of the customers call us to clean their carpets for appearance or cosmetic reasons. Cleaning for health requires that as much of the solid, particle soil be removed as is physically possible. This requires a thorough extraction/eradication of these soils.

The first step in any carpet cleaning process is DRY VACUUMING. This is the most important step in the removal of dry particle soil. In the process the dry particular soil that comprises the majority of the soils in the carpet is removed. 74-79% of soil present is of a dry particulate nature. Fine particulate soil is easier to remove when dry. Even when the pile is not dense, vacuuming is still an important step in cleaning. If dry particular soil is not removed the sharp edges of this particulate soil will scratch or abrade the fibres which results in a dull appearance or "apparent soiling" of the carpet. Customer should be advised that soiling can be significantly reduced by adhering to a regular vacuuming program, using vacuums with effective filtration systems and by using door mats to assist in trapping soils.

According to Australian and New Zealand Standards (AS/NZ 3733: 1995) for textile floor coverings - Cleaning maintenance of residential and commercial carpeting the requirements for vacuum filtration systems are that filtering systems used on vacuum cleaners shall be capable of filtering 97.5% of dust. If the vacuum being used utilizes bag-type technology it is imperative that the bag be emptied before collected soil reduces airflow. Remember that it is imperative to empty vacuum cleaner bag when it is no more than 2/3 full. Research indicates that a bag which is 25% full reduces pick up capability of the vacuum by as much as 80%. Most upright vacuums use disposable paper recovery bags. Do not attempt to empty and reuse them because the pores are plugged by the time they are full. Always put the new bag on the vacuum to insure the maximum performance of the vacuum cleaner.

There is several carpet cleaning methods available:

Rotary Shampooer

With Brush

In this process a foaming detergent (shampoo) suspends soil when agitated with rotary type brush action. Wet vacuuming or a water rinse is used to remove suspended soils and detergents. The purpose of the brush is to distribute chemical and to provide agitation.

This process requires a high degree of skill as there is danger of tip flaring or pile distortion from improper brush use or lubrication.

With Absorbent Pad (Bonnet)

In this process a solvent and/or detergent solution is sprayed into the carpet followed by rotary spin buffing of the carpet with a bonnet (cotton or rayon) to remove the loosened soils. The spin buffing is performed using an absorbent cotton or rayon pad, or bonnet, in place of the brush. It is important to change or turn bonnet pad when the pad surface is soiled and before it stops absorbing soil from the carpet.

Dry Foam Shampoo

A dense foaming detergent is applied to carpet and worked in with reel-type brushing action. Excess foam and suspended soil are removed with wet vacuuming.

Absorbent Compound

Absorbent granular carrier is emulsified with moisture, dry solvents, detergent and moisture is "broadcast" onto carpet surface and agitated with brush. After brush distribution, this "carrier" absorbs soil. After drying both carrier and soil are removed with dry vacuuming.

Steam Cleaning (Hot/Cold Water Extraction)

Hot water/detergent solution is injected under pressure, soil is suspended, and wet vacuum simultaneously removes soil and excess moisture.

To prevent furniture and rust stain developing following carpet cleaning it is important to place protective squares or blocks under furniture.

Grooming, also called nap or pile setting is an important final step in all methods of carpet cleaning as it improves the appearance of the carpet as well as facilitates more rapid drying of it.

Mechanics of Soiling

Soil can be described as any matter that is foreign to the basic construction of the carpet. Soil is attracted to the carpet from two sources: the atmosphere and foot traffic. Atmospheric soils include dust, lint, smog and fumes from any chemicals that are present in the room. Soiling due to foot traffic is the most noticeable and is the soil that the customer is usually most worried about. Soil can be further described as being real and apparent.

Real Soil is defined as any matter that is foreign to the construction of the carpet and which can actually be removed from the carpet, such as sand, grit, hair, food, ashes, etc. Most soil that accumulated on carpet consists of sand and dry particulate matter. This type is often gritty and abrasive. They contribute to the wearing of a carpet by physically cutting and scratching the individual fibres resulting in a dull appearance. It is estimated that 74-79% of the soil in most carpets is dry particulate or fibrous matter. The remainder of the soil in carpet is composed of oils, greases, starches, etc. Most soils found in carpeting are ACID in pH by nature. For this reason, most carpet

cleaning detergents are on the alkaline side of the pH scale. Alkaline cleaners neutralise this acid condition to enhance removal of soil. Cleaning residue in carpets is a major problem to the wear ability and appearance of carpets. Residue of chemicals, left behind can cause rapid resoling. This residue lowers the appearance level of many carpets. Cleaners must be cautious to use chemicals and procedures that do not leave excess or tacky residue in the carpet. Most soil can be removed by mechanical or chemical action, or a combination of these during the cleaning process. “Electrostatic bonding” will also tend to keep soil on the fibre by the electromagnetism of static electricity. It is a weak bond and may be overcome by vacuuming.

Apparent Soil is not actually soil, but the appearance, feel or smell that soil would cause if it were present. It appears as soil but cannot be removed because it is not really soil. This can be such things as a shadow, pile distortion, light reflection, wear, nap reversal and scratches in the face fibre. The determining factor is that no soil is actually present to cause the change or condition, however it looks as if soil were present and causing the undesirable effect. Carpet may appear darker in traffic areas, even after cleaning due to the presence of apparent soil factors such as abrasion, wear and pile distortion.

Abrasion - Dull dark areas caused by scratching of the fibres from particulate soils. Will appear to improve when carpet is wet.

Colour Change - Could be caused by chemical reaction, such as from pesticides, sunlight, bacterial/microbial action, such as from mildew, or environmental contamination.

Fibre Loss - Can result in altered light reflection and an apparent change in colour.

Pile Reversal/Pile Distortion - Dark areas in the carpet caused by a change in the direction of the nap lay. Can be caused by traffic but is also sometimes caused by improper storage of carpet. Usually appears in pivot areas and light/dark areas will change as viewpoint changes.

Reflection And Shadows - these conditions are caused by reflections which make the carpet look light and dark due to not-obvious light sources.

Inspection Light is an excellent tool for exposing hidden soil and eliminating shadows to reveal the true condition of the carpet. Exposed to inspection light and apparent soil will "disappear", while real soil will be highlighted.

The Ph. Factor

PH is a symbol used to describe the relative acid or alkaline characteristics of a water-based solution. It is the measurement that determines the relative acidity, alkalinity or neutrality of a water based solution. More simply pH is a measurement of acidity or alkalinity. The pH scale ranges from 0 to 14. At pH 7, the half way point, there is a balance between acidity and alkalinity. Solutions which measure the pH of 7 are referred as NEUTRAL and represent the pH of pure water. Acid side of scale is from 0 to 7 excluding 7. Solutions which measure between 0 and 7 on the scale are referred as ACID. Alkaline side of the scale is from 7 to 14 excluding 7. Solutions which measure between 7 and 14 on the scale are referred as ALKALINE. All major fibre producers state that cleaning agents with a

pH higher than 10 must not be used on stain resistant nylon carpets. If the solution has excess acid, the balance is shifted so the scale reads a number lower than 7. The greater the acid strength, the lower the pH value. Similarly, a solution that is alkaline has a pH that is higher than 7 and the greater the alkali strength, the higher the pH value - up to 14. The pH is determined by the number of ions in the solution. These ions are called hydroxyl ions on the alkaline side and hydrogen ions on the acid side. As pH levels increase or decrease, the number of ions increase or decrease by a factor of 10, representing a 10 fold difference in acid activity. Thus, pH 2 is ten times as acid as a pH 3 solution. A pH 3 solutions, in turn has ten times the acid activity of the pH 4 solution - and 100 times the acidity of the pH 5 solutions. The pH scale of 0 to 14 is derived from the chemical properties of water and this pH scale cannot be used with other solvents such as alcohol, oils and other non-aqueous systems.

Perfectly pure water is neutral - pH 7. However, almost anything dissolved in the water, in any amount, will affect the ph. freshly distilled water rapidly absorbs carbon dioxide from the air and reaches a pH of 5.5 in a very short time. Other materials dissolved in the water may have an even more marked effect. Depending on its chemical characteristics, it can either raise or lower the pH value. Thus the pH of any solution depends on the amounts and types of materials dissolved in the water. Some materials tend to stabilise a solution at a specific pH value. These are known as BUFFERS. Buffered solutions resist pH change when small amounts of acid or alkali are added.

PH can be measured by either using the pH Pen or pH Test Paper. To measure the pH it is necessary to dip either the pH paper or the tip of the pH pen in the solution for a second or two. With the pH pen the pH reading will be registered immediately. With the pH paper the excess liquid should be shaken off and then the colour of the strip should be matched against the colour of the pH chart giving you the required reading. Some materials, such as proteins and alkaloids, interfere with the indicator colour changes. Strong salt solutions (2% or more) may also have an adverse effect. In these cases, pH papers may not give reliable results. PH test kits can be useful to determine the nature of soil or staining material you wish to clean. Determining the pH can help lead you to the most effective method of removal. You should also use pH kits to determine the degree of acidity or alkalinity of your various cleaning agents so you can be more accurate in predicting their capabilities and effects on various fibres. Fibre producers and carpet manufacturers recommend that cleaning agents used for cleaning of synthetic fibres should have a pH equal or lower than 10.

Chemicals Used In Carpet Cleaning

A close look at the soils in the carpet reveals that the soils will fall into three categories: WATER SOLUBLE - such as sugars, SOLVENT SOLUBLE - such as tars and oils, and INSOLUBLE such as sand, clay quartz, etc. This would indicate that we must select a cleaner that is effective over a wide range of soils. The strength of a cleaning solution is determined mainly by its pH and concentration. Chemicals used in carpet cleaning will usually be formulated from the following raw materials:

Synthetic Detergents

The word detergent is derived from the word “deterge” which simply means to clean. Synthetic detergents have the desired properties of being soluble in water and at the same time having a liking for oily soil. They are used to separate soil from fibre surface through lubrication and suspension or

detergent action. Synthetic detergents differ from true soaps in their properties and are less likely to cause rapid re-soiling of fibres.

The detergent molecule has two ends with opposite characteristics. It consists of a head and a tail. Head is hydrophilic, which means it loves water and at the same time hates oil. Tail is hydrophobic, which means it hates water and at the same time it is lipophilic, which means it loves oil. It can be summarised by saying that a detergent molecule consists of two parts, a water loving head and an oil loving tail. The oil loving tail attaches to the soil of any oil like nature and pulls it into the water. When the water is agitated by either a scrubbing motion or other means, the oily soil is loosened from the surface and is then surrounded by the detergent molecule. By surrounding the oily soil, the detergent prevents it from being redeposited back into the carpet and thus can be flushed out. The detergents are generally neutral to very mildly alkaline. According to Australian Standards the pH left on a carpet after cleaning must be less than 8.5.

Surfactants (Surface Active Agents)

Surfactants or surface active agents have the ability to modify the surface tension. Surface tension, which is the attraction between molecules of water which will slow or prevent penetration of detergent, is reduced or lowered promoting penetration. Surfactants are added to the cleaning chemicals to decrease surface tension and aid in penetration. Surfactant or surface active agents possess a structure that consists of a polar head and a non-polar tail. Polar head is the part of the surfactant molecule that has a polar or electrical charge. The charge can be positive or negative.

In cleaning operation surfactants have two major roles: wetting and emulsification.

In the wetting process the surfactant acts as a bridge between the liquid and carpet fibre by facilitating spread of liquid across the carpet's fibre. In the emulsification process the surfactants act to break up and loosen the greases and oils on the fibre that bind and retain much of the dirt and soils.

Surfactants can be separated into anionic (negatively charged), cationic (positively charged) and non-ionic (no net charge, neither negative nor positive).

Anionic (negative charged) or Non-ionic (no charge) is frequently used in carpet cleaning detergents in order to enhance its performance.

Cationic (positive charged) are generally used in fabric softeners, antistatic treatments, and in quaternary ammonium chloride disinfectants. Fabric softeners are cationic chemicals that enhance the feel of fibres, nevertheless they should never be used on "stain resist", as the use of cationic treatments on "stain resist" may cause irreversible damage and will void manufacturer's warranty.

Alkaline Builders

Detergent builders play an important role in the cleaning process. Alkaline builders assist in softening water. Soft water will use less detergent and is a good cleaning ally. Their function is primarily to

support the detergent action (action of the surfactant) and suppress the potentially detrimental effects of calcium and magnesium ions (hard water).

Water Soluble Solvent

The inclusion of water soluble solvents in detergent such as ethylene glycol and alcohol are useful in coupling with greasy soils to aid in their dissolution into the detergent. Glycols are commonly used, since they generally do not affect mechanical seals in pumping equipment. They are safe to use, non-toxic and environmentally sound. However there are a few glycols like butyl glycol which should be used with caution due to its moderate toxicity as well as its ability to cause yellowing on stain resistant nylon fibres. Methyl, ethyl, isopropyl are common alcohols which are found in cleaning formulations. They are quite safe when mixed with water. They not only help to clean and sanitise the carpet, but also speed up the drying process.

Examples Of Cleaning Chemicals Include:

Traffic Lane Cleaners/Preconditioners are used to release soils from the yarn by using the process of "lubrication and suspension" of soils from the yarn. Traffic lane cleaners/pre-conditioners as a name applies is used for heavy soiled areas. For their optimum performance they are generally alkaline. Care must be taken to select a product with pH suitable for the carpet being cleaned (Stain Resist - pH less than 10). Prior to using traffic lane cleaners on “stain resist” carpet care must be taken to check its ph. That should be done by carefully reading the label and/or testing the chemical with pH pen or pH paper.

Emulsifiers/Rinse Aids are added to the rinse solution to assist in emulsifying the soil/preconditioner mixture present on the yarn.

Deformers are silicone based liquid corrective chemicals whose function is to reduce suds level formed in the extraction process. Liquid deformers should never be applied directly to the surface of the carpet as they leave sticky residue and can cause rapid re-soiling of carpet. They should be used only in the recovery tank of the machine. Powder or crystal deformers are formulated to be used on the carpet surface.

Finishing Chemicals are those applied topically after cleaning is completed.

Optical Brighteners are additives which, when subjected to ultra-violet light, will emit a blue-white light. They are rarely used in Australia and New Zealand.

Stain Repellents - acrylic co-polymer (silicone) and petroleum distillate (odourless mineral spirits) solutions that are applied to the carpet’s surface which primarily acts as a repellent to water based stains. The application of STAIN REPELLENTS to "Stain Resist" carpets will void manufacturer’s warranty. Silicones may also contribute to rapid resoling of carpet.

Soil Repellents - fluorochemical resins which are topically applied. They are applied to "stain resist" nylon during manufacturing or may be applied by the cleaning technician in the field. The fluorochemical is used to coat the fibre with a thin layer. The fluorochemical change the surface

tension of the carpet fibre, decreasing the ability of a liquid based stains (soil, water, and oil based spots) to penetrate the fibre. It increases the tendency of the liquid based stains to “bead” on the surface of the fibre. Their primary function is to impart soil resistance of carpet.

This topical treatment provides the following benefits to the consumer.

- Increases carpet fibre resistance to oil and water.
- Alters surface energy of yarns to resist adhesion of dry soils.
- Can be applied to "stain resist" carpets during the manufacturing process as well as being approved for application to “stain resist” carpets in the field.

Soil Repellents/Acid Dye Blockers are treatments which provide the advantages of fluorochemical resins as well as the advantages of acid dye blockers. They can be used to restore soil/stain release properties to old or violated stain resistant nylon or to impart stain resistance to non-stain resistant nylon carpets. Acid dye blockers act like colourless dyes and cause fibres to resist most common household food and beverage stains. Many carpet fibres are positively charged, whereas most common stains are acid in nature and thus negatively charged. The positively charged fibres attract and strongly bind acid stains which are negatively charged. The strong bonding between the two is created, making stains difficult to remove. Soil repellents work on exactly the same principle. A negatively charged stain blocking agent reacts strongly with the positively charged carpet fibres; they encapsulate the fibre and create a negatively charged barrier or layer on the carpet. Since two similar charged materials repel one another, the acid based stains are unable to bond to the carpet’s fibre. The fluorochemical is applied in a thin layer, increasing the tension of the carpet, therefore protecting it from oil and water based stains at the same time.

Before using any chemical/cleaning agent or spotting solution the technician should always:

- Follow the label instructions precisely
- Use the appropriate safety equipment
- It is recommended that the cleaning agent should be pre-tested on the fibre to be cleaned to ensure that it does not cause bleeding of the dyes used on it

Testing should be conducted as follows:

- A small amount of the strongest cleaning agent (neutral or slightly alkaline) you wish to use should be applied onto a clean white towel and then blotted onto the fibre to be cleaned. If colour transfers onto the white towel, it indicates the potential bleeding problem. If this is the case further pre-testing is required.
- A small amount of a neutral or slightly acid cleaning agent should then be applied to a clean white towel and blotted onto the fibre to be cleaned. If colour transfers onto the white towel it indicates the potential bleeding problem. In this case, you can come to the conclusion that because the fibre you are working on will bleed in water-based solutions it is necessary to change to non-water, solvent-based cleaning agent and proceed further by pre-testing the appropriate chemical.

The Cleaning Process

Dry Soil Removal

The process of cleaning is quite a simple one. All fibres are cleaned using the same basic principles. First, any dry soil must be removed. Then fibres must be washed (Soil Suspension), rinsed (Soil Extraction), then pile should be groomed (Nap Setting) and finally fibre should be dried.

Up to 79% of the soil present in carpet is of the insoluble particulate or fibrous nature. Majority of this soil generally accumulates around the main entry area and settles in the lower third part of the fibre due to forces of gravity. These soils are removed most easily when they are dry, therefore making carpet pre- vacuuming the first step in the cleaning process. If you wet the carpet first you will immediately convert the dry soil into mud, which is much harder to remove from the carpet. The removal of dry particles is a very important step in carpet cleaning. This should always be the first step in any cleaning process.

Although carpet soil composition varies from area to area, an average analysis indicated that the composition of this soil is as follows:

Sand, clay, quartz	45%
Animal fibres	12%
Cellulosic materials	12%
Resins, gums, starches	10%
Fats, oils, rubbers, tars	6%
Gypsum	5%
Limestone, dolomite	5%
Moisture	3%
Undetermined	2%

These particulate and fibrous soils are insoluble in nature and are best removed using a mechanical process (vacuuming). These soils resist removal through several types of physical action. Cracks and/or crevices engineered into the fibre surface will act as a trap for some of these soils. Some will be adhered to oily residues which are present on the fibre/yarn surface from cooking and automobile exhaust, industrial pollution which moves into the home on air currents and is tracked in on dirty shoes. The smallest particles will be attached by electrostatic attraction. The size of particles or droplets we are dealing are determined in Microns, which is one-millionth (1 to 1,000,000) part of a meter.

Some particles which are present may be retained in the carpet's fibre by a number of different reasons. Some larger particles will be held in place simply by becoming entangled in the crimps of the yarns and the mass of the carpet structure; this is called macro-occlusion. Some, especially the

more minute particles, are entrapped in yarn irregularities, crevices and cracks on the fibre surface. Abrasion will also provide sites for this entrapment; this is called micro-occlusion. All these contribute to the problems associated with removal of soil.

In order to dislodge dry soil and remove it effectively it is important to implement brush/agitator action. To maximise the removal of dry soil from the carpet it is advised to brush or rake the carpet prior to dry vacuuming. This mechanical agitation facilitates the dislodgment of soil and allows the cleaner to remove more soil in a process of dry vacuuming. Thorough regular vacuuming with a vacuum cleaner that has a high efficiency filtration bag is important for reduction of respiratory irritation. Respiratory irritation occasionally experienced in the presence of carpet can be frequently attributed to environmental tobacco smoke, which is absorbed by carpet, presence of dust mite faecal matter, and presence of smaller than seven microns airborne particles (pass through low-efficiency filtration bags) in the environment.

Selection of an adequate vacuum cleaner for the job is very important. The upright type of vacuum cleaners with an agitation brush or a canister type with a power head is most effective on a thick carpet. In the process the pile is separated and lifted, while the soil particles are moved towards the tip of the fibre. The vacuum selected should have a powered agitation brush and if the machine uses bag-type technology the bag should be able to fill from the top so that “old soils” movement inside the bag are minimal. The bag on the vacuum should be emptied before it is 2/3’s full. There are machines currently available which utilise cyclonic filtration rather than bag-type technology and they are quite effective for pickup of dry soil.

Canister vacuums are used to pick up litter and trash. This type of machine is not suitable for removal of dry soil in trapped in the fibre and are not recommended to be used for this purpose.

Over heavily soiled areas the carpet should receive at least 6 to 8 passes. These areas are generally located near the door and entrance into the kitchen area. The rest of the carpet should receive at least 2 passes.

Now that dry, particulate soil is effectively removed we should move to the next step of the cleaning process, which is the wet cleaning of the carpet.

Wash or Soil Suspension is the second step in cleaning. Soil suspension can be easily described as a key principle in cleaning. It involves the separation of soil from the fibres so that in the next step of rinsing these soils can be successfully removed.

Soil Suspension & the Tact Pie

There are four fundamentals of soil suspension; together they form the so called “THE CLEANING PIE”. The balance and size of this pie or the proper use of the fundamentals will determine how efficiently soil suspension occurs. It will also ensure that fibres are not over wet, and will speed up the drying process. The four fundamentals of soil suspension are**: temperature, agitation or mechanical action, chemical and time**.

Temperature

Temperature may be the most controversial of these fundamentals. According to well recognised scientific research and theory, the more heat you have, the greater the cleaning power. This theory was first discovered and researched by a Swedish scientist Svante Arrhenius. According to his research, the increase of temperature of water from 65°C to 100°C yields a considerable and steady increase in energy. He further proved that for every 10°C increase in temperature of water above that lower limit of 65°C, there was a corresponding increase in energy release from water by a factor of 2. This does not mean that results will be doubled; however the potential for cleaning will double. Therefore we can see that hot water will clean much better than cold water, making the use of hot water an extremely valuable tool in carpet cleaning. The development of the truck-mounted systems gave the on-site cleaner an almost unlimited supply of hot water. The hot water should not be viewed as harmful to the fibre or the carpet. Let us see how hot the water that we can deliver onto the carpet's fibre is. If we begin with hot water temperature at the machine of around 90 °C, testing has shown that by the time that the water reaches the face fibres of the carpet it will have a temperature of some 80 °C. This temperature will drop further when the solution comes into contact with the carpet fibres and will reach a very cool level after the vacuum passes are made. However, there are a few exceptions to this rule: when cleaning a true "velvet plush" carpet the temperature should be slightly reduced.

Agitation or Mechanical Action

Agitation or Mechanical Action is also a very important fundamental of soil suspension. It can be accomplished with a brush (manual action) or with a rotary or cylindrical shampoo machine. The proper agitation will assist in achieving the following benefits:

- Aid in the distribution of preconditioning agents/chemicals
- Aids in penetration of chemicals into the soils that we are attempting to remove
- Assist in soil suspension and dislodgment
- Lift and separate matted and crushed face fibres

Chemical Action

Chemical Action is provided by the chemicals used in the process of cleaning. The chemical action involves the inter-relation of the detergent with the soils and the surface to be cleaned. Application of this cleaning agent, called a preconditioner, to the carpet fibres is the first step in loosening or suspending soils which are present on the fibres. Preconditioner require 5 - 15 minutes of contact with the soil to accomplish this loosening or suspending (please read and follow manufacturer's instructions for specific product requirements).

Time

Time is an important factor. Time is considered to be an amount of seconds, minutes or hours required for the cleaning agents to provide the optimum efficient interaction with the fibre and perform their function of releasing the soils from the fibres. This contact time is referred to as DWELL TIME and is generally considered to be between 5 – 15 minutes. Time is the most expensive factor of the fundamentals of soil suspension. All chemical compounds with which we work require some amount of time to accomplish their work and are best utilised if given the necessary amount of

time to perform their job. Since labour is the single highest cost item in a cleaning business it is important that this time be used to best advantage.

Even though we refer to the fundamentals of soil suspension as a ”pie” with four equal slices, however in reality we discovered that the size of each slice or fundamentals varies greatly from cleaning system to cleaning system as well as the size of the “pie” (cleaning efficiency) itself. Any time one of the fundamentals is decreased the other fundamentals should be increased in order to keep the overall cleaning efficiency at the optimum level, or it can be said to keep the “pie” as large as possible.

Rinse

Now that we have examined the four fundamentals of soil suspension: CHEMICAL ACTION, MECHANICAL ACTION, HEAT and TIME - let us now proceed to the actual soil removal process - the RINSE PROCESS. Step three is RINSE or it can also be called the Soil Extraction or Soil Removal. This third major step is the removal of suspended soil that has been loosened and cleaning solutions from the surface and leaving the fibre clean, and residue free. The application of the preconditioning agents which to the carpet during the wash cycle do not physically remove the soil from the yarn, it only loosens the soil. The rinse process is the step at which soil is actually removed and, in the case of hot water extraction, its success will depend on two factors: injection of the rinse agent and its extraction.

The penetration of the rinse solution is going to be influenced by a number of factors. Among them are densities of face fibres, pressure of water spray, chemicals that have been added to the rinse solution, and to some extent the temperature of the rinse solution.

The denser the face fibres are, the more difficult it will be for the rinse solution to get down into and back out of the face fibres. For this reason carpets with very open face yarns are very easy to rinse. The very dense carpets are more difficult to rinse thoroughly and to dry.

The pressure of the rinse solution will obviously be a factor in the penetration of the rinse solution. Water pressure in the range of 250-400 PSI works quite well in the rinsing of most carpets. At this pressure range there does not seem to be any wetting of the backing in normal situations and no distortion of the face pile is experienced.

Adding various chemicals to the rinse solution in the proper quantities will facilitate the penetration of the solution through a wetting action or a reduction of surface tension. This allows the rinse solution to move more easily into and around the fibres. Overuse of these wetting agents will promote over wetting and its accompanying problems: odour, wicking, mildew, etc. For this reason extreme care should be used in selecting the proper rinse aid and in mixing the product selected.

Temperature of the rinse solution will also have an effect on penetration since heating water is an effective means of reducing surface tension. Hot water will also emulsify the soils and chemicals more quickly and effectively resulting in a more thorough rinse while using less water. This will result in a more rapid drying of the carpet.

The two main factors that ensure the success of the rinse process are the penetration of rinse and extraction of rinse.

Extraction of the soils and the rinse solution is the most critical part of our process.

The success of the extraction of rinse will depend on the following factors: fibre absorbency and the effectiveness of the vacuum system.

Fibre absorbency, every fibre has different absorbency. Fibre absorbency, while not a controllable factor, is nonetheless an important factor to consider. Natural fibres, such as cotton and wool, are highly absorbent and will retain more moisture and take longer to dry than will synthetic fibres.

Cotton	8. 5% absorbency
Wool	16 - 18% absorbency
Nylon	4% absorbency
Polyester	0.4% absorbency
Polypropylene	0.1% absorbency

The effectiveness of the vacuum system can be assessed by the following parameters:

- AIR FLOW is the volume of air being displaced or moved around in a vacuum system. We are talking about the flow of air through the face fibres, into the wand, through the vacuum hose and into the recovery tank. Air flow is what moves the rinse solution and suspended soils out of the face fibres and, ultimately, into the recovery tank. Airflow is traditionally measured as Cubic Feet Per Minute (C.F.M.) or Litres Per Second (L/S) The conversion between Litres Per Second and Cubic Feet Per Minute is 1 C.F.M. = L/S x 2.25. The higher the volume of this air (CFM), the greater the amount of moisture which will be removed from the carpet fibre. Most electric portable extractors move about 100-110 CFM when the flow is not restricted, and proportionally less as the intake port is obstructed. Distance is also an important factor in portables since the friction generated by the flow of air and water will overcome the ability of the vacuum motor to pull it through over 20 to 30 meters of hose. Truck mount vacuums, on the other hand, pull as much as 400 CFM through up to 120 meters of hose and are able to accomplish this without an appreciable reduction in flow.

- Vacuum or LIFT can be better described as suction. Lift relates to the ability of the vacuum source to move water, or mercury, to a measured level in a tube. It is normally measured in terms of inches of water lift or mercury lift (Hg). Mercury lift is the accepted measurement of vacuum, suction or lift in a vacuum motor. The ratio between water lift and mercury lift is about 13 to 1, or 1 inch of mercury equals about 13 inches of water lift. Portable machines will typically have water lift of 80" to 180", depending on vacuum size and number. In the portable type vacuum system as the water lift increases the air flow decreases. In the truck mount system vacuum lift is usually set at 11-15" of mercury and air flow will be maintained even when the unit is creating maximum lift.

- Air Velocity is the speed with which the air is moving in the vacuum system. This is measured in terms of Feet per Minute. The determining factors in the speed are the airflow and the size of the orifice through which the air is being moved.

- Air Watts is considered to be an important indication of the performance level of the vacuum system. Basically the higher the air watts the better the performance. The following equation should be used to measure the air watts: Air Watts = Lift x CFM ÷ by 8.5

The success of penetration of rinse will depend on several factors:

- Density of face fibres of carpet
- Pressure of water spray.
- Nature of chemicals that have been added to rinse.
- Temperature of rinse solution.

Pile Setting

Step Four is Pile Setting or grooming. Carpet fibres should always be groomed in the desired direction prior to drying. All carpets are subject to pile shading during cleaning as wand marks and swirls from the rotary machines do leave marks on the carpet. All these can be removed by grooming, giving carpet its attractive appearance.

Drying

Drying is the fifth and final process. It's the process of removing water, solvent or other liquid from the carpet fibres so that they can return to their normal appearance and texture, while not attracting or holding additional soil. The process of drying can be summarised as the process of moisture evaporating out of the carpet fibre and into the air where it will naturally condense and return to the earth as water. The drying time of carpet following cleaning can be affected by the following factors: the cleaning method employed, the level of soiling of the carpet as well as by the ventilation and air flow in the areas being cleaned. Drying, ideally, should occur within 6 to 8 hours or less. Customers consider drying time of carpet as an important factor, but additionally it is very important to minimise the drying time in order to avoid problems related to dampness such as mildew, resoling, odour, etc. In wet cleaning situations it is best to ensure rapid drying by making optimum use of these two natural actions: evaporation and condensation. Evaporation can be described as the changing of a liquid into a vapour or gas at normal temperature. Evaporation is affected by air movement, air temperature and relative humidity in the area. The quickest drying time can be accomplished with good air flow in the area and good ventilation. Slow drying can also contribute to soil wicking, although soil wicking can be caused by several other factors in addition to slow drying. It can also be caused by fibre over wetting as well as heavy accumulation of soil at the base of yarns. Carpet fibres dry from the bottom to the top through a natural process called capillary action or wicking2. In normal cleaning situations the amount of water left after cleaning is low enough that it will evaporate away in less than 12 hours. As this moisture escapes into the air directly above the carpet surface, this surface air begins to become saturated and it is necessary to move this wet air and replace it with fresh, dry air. If the weather is good and dry this movement of wet air out and dry air in can be accomplished by leaving several windows open. In less than ideal weather conditions it

[2] Wicking is defined as the upward flow of moisture on fibre surfaces during drying period. It is an important part of drying process

may be necessary for the cleaner to provide that air movement in order to facilitate the drying process of the newly cleaned carpet. In this situation it is best to use devices that will provide any means of air movement in the area. In order to reduce wicking on carpet or rugs with the olefin face yarns it is advisable to pre-vacuum them thoroughly prior to the cleaning process, then once cleaned it is important to ensure that they are left as dry as possible. That can be achieved by making some extra drying passes over the carpet or rug (by using either of the methods: wand, bonnet, etc). The drying time can be reduced through the use of auxiliary drying systems such as air movers.

Relative humidity is the measure of the ratio of the moisture present in the air relative to the total amount of moisture that the air could possibly contain. The lower the relative humidity, the higher the ability of the air to absorb the moisture which is evaporating from the carpets. If the air in the newly cleaned area becomes totally saturated (relative humidity reaches-100%) no further drying will take place and, indeed, moisture may begin to condense on cool metal surfaces. Under these circumstances it is necessary to lower the relative humidity in the room. This can sometimes be accomplished by opening windows and doors and allowing the moist air to escape and be replaced by dry outside air. If this is impossible then mechanical means must be used to dry the air. It can be achieved by using dehumidifiers, which cool the air, causing the moisture to drop out of the air as well as creating the dry air conditions facilitating drying process.

This covers the subject of cleaning carpets with the use of the hot water process.

The Electrodry System

Regular Service

This is our basic system of carpet cleaning and the service which leaves the carpets 'Walk-On-Dry'. The regular service is typically used for carpets which have been kept in fair condition and have fared well with regular, everyday use.

Step 1

Pre-Vacuum. This is designed to remove the particulate matter (dry soils) from the carpet fibers. This is the only way to effectively remove dry soils (dry soils make up just fewer than 50% of the carpet soiling) from the carpet fibers. The vacuum should be undertaken so as each pass has a 50% overlaps on the previous pass.

Step 2

Pre-Treat Stains; Oily stains should be treated with Dry-solve E (A volatile dry solvent which must be applied whilst the carpet remains dry). General stains may be pre-treated with E1 up to 5 minutes before cleaning. For all other stains consult the Electrodry stain removal guidelines.

Step 2

Spray the carpet with Electro 1. This is a white milky colored liquid that is alkaline in nature with a pH of 10 (will only work with minimal dwell time that for the best results should not exceed 10 minutes dwell time). In the case of heavily soiled carpet you may wish to apply a light spray of Electro Prespray (blue liquid pH 11 – will work best with extended dwell time). On average you should use 1

* 15 litre container for approximately every 45 rooms of carpet cleaning. This equates to 330mL per average room.

Step 3

Place a 20 litre bucket containing 10 litres of water on a towel or pad in the laundry. Add to this 200 ml of Electro 2 (light blue colour) – this will give the water in the bucket a pH of 3-3.5. Place in the bucket a giant immersion heater to heat the water. If the same bucket of water + E2 is used at further jobs then a further 125ml of E2 should be added to the bucket before each further job.

Dip a cleaning pad into the bucket and pull out, fold this pad in 2 and squeeze down the straight side, then fold in half and fold in half again. Place 1 hand around both end and squeeze bringing knuckles together. If you squeeze your pad by twisting it then your pads will stretch into an oval shape and they will become difficult to use. Place this pad on the floor to go underneath the rotary machine. Use the rotary machine to perform the cleaning process changing pads as the pad's start to dry out. You should use at least 2 pads per room.

The cleaning pads must be continually changed and rinsed. This can be done by placing them under running water in a tepee formation and then shaking the pad in the water. At the end of the day the pads should be washed in a washing machine.

Step 4

Groom the carpet using your combo grandi groom rake. Wipe all skirting boards of fluff that may have been sprayed as part of the cleaning process and replace all furniture that may have been moved as part of the cleaning process placing some plastic under the legs of stained wooden furniture to prevent against any damage from the bleeding of the lacquer.

How Does the Electrodry System Work?

Initially the carpet must be vacuumed with a beater type vacuum system with a hyper filter. This removes the particulate matter from the carpet and stands the fibres up or opens the weave to accept the chemical part of the process. Once the carpet is vacuumed the carpet is then sprayed with the Electro 1 solution. This solution is water-emulsified solvents with a pH of 10. This is what dissolves a good part of the stains. At the same time it dissolves the oil that is holding the balance of the soil in the carpet and keeps it in suspension. After a short dwell time the area to be cleaned is treated with a solution of an acidic nature. This is done by the use of a pad that has been soaked in the product Electro 2 whilst that product is just below boiling point. The pad is then squeezed and placed under a rotary machine and passed over the area treated with Electro 1. The Electro 2 is as stated acidic in nature and is used to remove stains that can only be treated with acids. All carpet dyes have their colour set by acids, so the use of an acidic solution as part of the process resets the colour and brightens them. When the hot pad containing the Electro 2 comes into contact with the area sprayed with Electro 1 a chemical reaction happens. This chemical reaction is called and exothermic reaction (simply put it means a heat creating reaction). The reaction – simply put is, acid + alkaline = water + salt + heat. This is why our process of cleaning is called the exothermic process. What happens when the chemical reactions occurs is the chemicals are neutralized and the heat given of forces the oil and residual soils held in solution by the Electro 1 to travel up the fiber and be collected in the cleaning pad. The best way to demonstrate this is to think of a situation where wax is on a carpet floor. To remove it you place an absorbent material such as brown paper on the fibre

and then put a warm iron over the brown paper. You would think the heat from the warm iron would melt the wax and force it to the bottom of the carpet. In fact the wax travels up the fibre to the absorbent surface (brown paper).

When the chemical reaction is complete the soil and oil would have travelled up the fibre into the absorbent pad. At the same time the chemical reaction once completed neutralises both the acid and alkaline solutions. To prove that this has occurred, a litmus paper test can be used. The chemical first sprayed would register high PH being alkaline and the area that has been treated (whilst moist) will register neutral i.e. Equivalent to that of water.

In summary, our Dry Cleaning extracts the oil and dirt films from the fibre through an exothermic spirit based chemical reaction that once complete, leaves the carpet neutral and free of residual detergent.

Advantages of Our System

- As stated before, no detergent residue remains. All other systems will leave a high alkaline reading, providing that there is detergent residue in the fibre that will attract dirt (fast resoling). Of recent times neutral carpet cleaning products have been produced that overcome some of that problem for steam cleaners BUT that has the disadvantages that they do not treat stains as part of the process. This is because some stains need alkaline and acid treatments to remove them.
- The acid side of the reaction will brighten fibre colours (that is how colours are set in the first place). Other systems do not do this.
- In total for the average home we would only use about 2 litres of fluid, which is spirit based so it dries rapidly.
- Because of reduced moisture content, we can guarantee the carpets will not shrink or stretch.
- The carpet down time (inconvenience) is minimised.
- The carpets will not have the 'wet' smell.
- Spirit based cleaners remove more stain than water based - and in our system all three agents used to remove stains are working - spirits, alkaline acidic - but on completion the carpet will be neutral.

The Electrodry System – In Depth Procedure

- Whilst we have already explained the theory behind the carpet cleaning process, the following is a detailed summary of the steps that should be taken in the job. You should always carry a list of your operating procedures with you in the van.
- Park the van, check your appearance, collect your invoice pad and order form (job sheet) and go to the front door of the premises.
- Introduce yourself to the customer making sure that shake the customers hand and check that what is written down on the job sheet is what the customer is expecting you to clean. If there is

any variance, note it on the invoice. At this time you should supply the client with a “Carpet and Fabric Care” booklet.

- Inspect the area to be cleaned with the customer, noting the wear marks, stains and condition of the carpet prior to commencing the work.

- Always confirm the price for the carpet cleaning work before commencing. This will save any confusion at a later time.

- Ensure the carpet is clear of any obstacles such as children’s toys, etc. Advice the client that children should not be present whilst you are working as it could be dangerous. Advise the client that should they walk across the carpet before it is completely dry and then onto any hard surface their feet could easily slip because of the moisture. Set up a “wet area” warning sign.

- Move the furniture out of the room and if not possible move it to the centre of the room. Ensure that when moving furniture that you only move the items that you can comfortably move and that care is taken to bend the knees when lifting – See notes in the Occupational Health and Safety manual on manual handling.

- Return to the truck and initially check that there is Electro 1 in the pressure sprayer. If not fill the sprayer. One container should be enough to do most homes. If a large premises take two sprayers. Then take all the necessary equipment to the premises and position it so that it causes the least interference and appears to be safe.

- Set up the bucket to contain the Electro 2. This should be in a position preferably in a corner where no one can knock it. Ensure the bucket has a mat under it. Then add ten litres of water. Wearing plastic gloves dispense 200 ml of Electro 2 into the bucket. Insert the immersion heater into the solution making certain it is not touching the bottom of the bucket. Turn on heater. Place a red cone next to the bucket for safety reasons.

- Rake any area in the first room and if possible all rooms where the carpet has matted.

- Using a carpet broom go around the edges of the room to remove fluff and any excess fibres.

- Adjust the height of the vacuum setting to suit the carpet pile then thoroughly vacuum the cleared area. In traffic areas make numerous passes.

- Insert four bonnet pads into the Electro 2 solution and ensure the temperature is approximately 85 degrees C.

- Take the pressure sprayer containing the Electro 1, shake it and then apply a spray over the area to be cleaned but never greater than 10 square metres. The area to be sprayed should be thoroughly covered in one direction and then the opposite direction and then feel touch damp.

- Position the Rotary machine near the area to the treated with the Electro 2 and connect the power lead to the closest point but not across the path of the cleaning.

- Put on heat impervious gloves and take one pad out of the Electro 2 bucket. Fold the pad as demonstrated in training (or use a pad squeezing bucket) and squeeze the pad to remove excess moisture.

- Place the bonnet on the floor in the centre of the area to be cleaned and quickly place the Rotary machine over the bonnet and start the machine.

- The Rotary machine with bonnet pad should travel across an area no larger than 5 square metres, back and forward in opposite directions. The bonnet should then be removed and set aside for cleaning. The procedure should be repeated using new clean bonnets until the allocated 5 square metres is clean. Care must be taken that the bonnet pad being used does not get too dry as it may scorch the carpet from the build-up in friction.

- The procedure should be repeated until all the outer area of the carpet in the room is cleaned.

- The cleaned area should then be raked or broomed depending on the type of carpet. Wools should generally be brushed and longer piled synthetics raked.

- The furniture in the centre of the room should then be pushed back to the cleaned area and the same procedure as outlined above be used to clean the centre of the room. For each room follow the same procedure. Ensure that Styrofoam blocks or pieces of foil or plastic are places under the legs of the furniture to prevent and bleeding of colours or lacquers and to prevent rusting.

- At all times the dirty bonnets should be put away for cleaning on return to the depot or if limited in bonnet numbers they should be cleaned at the premises. This entails rinsing the pads under warm water until no dirt comes from the pads.

- The Electro 2 needs to be watched at all times. As the volume of the solution diminishes, water and more Electro 2 needs to be added. The amount of Electro 2 should be added at the rate of 1:39 for each part of added water.

- After the cleaning process wipe all skirting boards to remove any moisture or fluff that may have been sprayed onto the skirting boards.

- On completion the carpeted area needs to be inspected. If any stains remain they may need special attention in consultation with the customer.

- Rake or brush the carpet again where it has been walked on then consult with the customer. When the customer is satisfied with the result ask the customer to sign off on the invoice and ask for the sum due. A written invoice in a format approved by Whistle must be supplied to all clients.

- Wipe any hard surface that may have moisture on it with a clean dry cloth.

- Collect all equipment and return it to the van. Any unused Electro 2 should be disposed of down the sewer.

- Return to the premises and check you have collected all equipment and again ensure the client is delighted with the results.

Stair Cleaning

Step 1

Perform a thorough pre-vacuum of the stairs by using the hose attachment to the vacuum cleaner

Step 2

Spray the carpet with Electro 1 only spraying 5 to 6 stairs at a time as too long a dwell time will affect the effectiveness of the cleaning product. If the stairs are very dirty you may wish to spray the stairs with a light spray of Electro Prespray as an initial step.

Step 3

Lightly scrub each stair with the C8 hand pad then clean stairs with hot water extraction system as directed in upholstery cleaning.

The Dual Process Carpet Cleaning System

This is a system of carpet cleaning that incorporates a combination of dry cleaning and steam cleaning using the advantages of both systems to achieve carpet cleaning results that surpass any other system of cleaning. Dual process cleaning is generally using in areas where the carpet has been subject to large amounts of traffic and oily soils or large build-ups of sugar. It is often called restorative cleaning as it may be the only type of cleaning that can restore a carpet to a reasonable condition after years of neglect.

The dual process cleaning system is as follows:

- A thorough pre-vacuum of the carpeted area to remove the dry soils.
- Pre-spray the carpets with E8 mixed to the appropriate dilution and allow a dwell time of at least 15 minutes. In areas of very heavy trafficking you may wish to agitate this product into the carpet using the grandi-groom rake.
- Clean the carpet using the hot water extraction system with water at 70-80 degrees and 300-500 psi of pressure
- Follow the standard carpet dry cleaning procedures as listed in this manual
- Use a dry pad under the rotary machine over the floor area to help remove any excess moisture.
- Groom carpet with the grandi-groom combo rake.

NB. This process will often take 1.5 to 2 times the amount of time required for a standard carpet dry clean. I suggest charging an additional 80% of the original cost for the cleaning.

Spot and Stain Removal

Spots

Spots - discolouring materials which adhere to outside yarn, causing discolouration of fibre. Spots are lighter than the original colour of the carpet. Most spots on the carpet are created by chemical spills or application of a colour removing chemical. Many of these discolouration's can be successfully rectified by implementation of the process of Spot Dyeing. The area of the damage

should be carefully assessed prior to Spot Dyeing. The largest area suitable for spot dyeing would be at most the size of a dinner plate. For spots that are bigger in size we recommend the use of full room dyeing procedures. Most wool and nylon carpets and rugs can be spot dyed easily as long as the colour repair person follows the prescribed procedure. You will be amazed at the results you will be able to achieve and how easy it will be to repair the colour of the carpet once you attend Colour Repair Courses, allow yourself to do some practice work and gain the knowledge and understanding of the colours theory.

Causes of Colour Loss

The colour loss can be caused by either chemical or natural means. You must determine the cause of the colour loss prior to starting the colour repair, as the procedure that you must follow depends on the cause of the colour loss. Natural causes for colour loss can be classified as sun fading, ultraviolet or fume fading. In these cases, the fading usually occurs over a long period of time. Sun fading destroys the dye's chromophores and causes it to lose colour. Red is usually the first colour to fade, then it is followed by blue. This explains why brown and grey carpets fade to green and then to gold. If the loss of colour was due to natural means such as described above, then you can proceed with the colour repair without neutralising the area. Chemical causes for colour loss are usually caused by application of chemicals by homeowners or by pet's excreta. The main causes for colour loss are: chlorine bleaches, pet stains, and cleaners that have high ph. If the loss of colour was due to a chemical means, such as chemicals or pets then the area must be thoroughly cleaned and neutralised to remove any chemical residue prior to colour repair. If this is not done, then the colour you restore will in most cases not remain in the fibre and the restored colour will not be permanent. Different neutralising treatments should be implemented for spots and stains caused by different chemicals. It is important to identify the source of spots and stains in order to utilise the best procedure.

Method of identification:

- Ask customer
- Assess appearance
- Assess texture
- Measure pH level of the area
- Assess the location of the area
- Smell the area

Methods for Cleaning Various Spots

Chlorine Bleach

Chlorine bleach not only removes the colour from nylon and wool fibres, but in some cases destroys part of the fibre, and therefore the ability of the fibre to hold dyes. Presence of the chlorine bleach can be easily identified by its bright yellow colour, or absence of colour in the carpet completely and pH reading of 10-12.

The following procedure must be used to pre-treat a spot caused by Chlorine bleach:

- Thoroughly rinse and extract the area using cold water
- Apply a small amount of mild reducing agent on top of the spot, if the spot penetrated into the fibre, inject mild reducing agent (Approximately 5 mls.) using a carpet needle and syringe into the area around the spot and into the centre of the spot.
- Allow couple of minutes for the mild reducing agent to work.
- Rinse and extract the area using cold water.
- You are now ready to correct the colour by using recognised dyes available for spot dyeing.

In case the spot was caused by Benzol Peroxide, known as acne medication the same procedure as for Chlorine bleach should be followed.

Spots Caused by Pets.

Pet stains can be caused by pet's urine or faeces. Each stain is different in appearance and requires different treatments. Make up of urine is mixture of urea, uric acids, organic salts, pigments, etc. Pet's urine spots that appear as light yellow in colour with the high pH levels can be colour repaired. The presence of urine can be confirmed with the use of the moisture detector and ultraviolet light. There are special digestive enzymes that may help in the treatment of the stain. In cases of old urine stains the damage to the carpets fibre can be very extensive, reducing the ability of the fibre to accept dyes. In some cases the damage to the fibre is so severe that the carpet might be beyond colour repair or even full room dyeing, making carpet replacement the only possible solution. Always assess and qualify a job carefully and if proceeding with colour repair neutralise the spot by using the following procedure:

- Apply acidic solution on to the fibre to neutralize alkaline salts in order to return fibre as close to neutral pH as possible.
- Neutralized alkaline salts and/or acid present in urine must be thoroughly rinsed and extracted using cold water
- The adjusted pH of the fibre must be 4-7.
- Rinse and extract the area using cold water.
- You are now ready to correct the colour.

Faeces are normally alkaline and darker than the surrounding carpet. The stain must be washed and the dark colour removed with the use of recognised colour removing agents before the carpet can be dyed. The pH level of the carpet should be adjusted as close to neutral as possible (4-7) before redyeing.

Mysterious Spots

At times mysterious spots appear on the carpet, Mysterious small area discolourations are caused by chemical attack on dyestuffs. The chemicals are readily available materials intended for other uses that are deposited on carpet. The action of the chemicals on the dyes is usually not immediate. The chemicals lie dormant until a trigger force is present. They can be associated with the use of the chlorine bleaches, any presence of pets urine, use of benzoyl peroxide carriers, pesticides or the use of the cleaners that are sold at the supermarkets and that have very high pH levels (12-14). The trigger force is often supplied by the environment in the form of moisture (humidity) and heat. Man may apply the trigger force by application of chemicals that are not appropriate for the fibre. Any time the high pH chemicals are used on a carpet the chances of colour loss and/or colour change are very high. If the cause of the spot cannot be identified, its pH level should be tested to determine if the spot was caused by a pH problem. If this is the case, the pH level of the damaged fibres should be adjusted to a pH of 4 to 7, by using an acid rinse, then once the pH level is adjusted to the required level (between 4-7), the spot can be colour repaired.

Benzoyl peroxide carriers are insoluble in waters and are hard to wash off from fibre and skin. Even the small exposure of fibre to these products can cause colour loss on almost any nylon carpet and other fibres as well. Not only does it attack fabrics, but it attacks colours in plastics.

Pesticides used to control cockroaches, spiders, fleas (in carpet), etc. Also used in powders, shampoos, and collars to control fleas and ticks on pets. This chemical may cause colour change in nylon carpet and other fibres. Usually appears along baseboards following treatment.

Stains

Stains are materials that adhere to the fibre. Stains are darker than the original colour of the carpet.

Stain Forms

Water-Soluble - composed of materials which are soluble in water based solutions. Most stains are water soluble and will respond to water based cleaning solutions. This is why many stains are easily removed during the process of hot water extraction/steam cleaning. A lot of water soluble stains consist of sugar and starches.

Solvent Soluble - composed of materials which are soluble in non-water (solvent-based) most non-water soluble stains consist of oils, greases, pigments, etc. Some of these can be converted to water soluble form and then removed by using water based solutions.

Non-Soluble or Insoluble3 - composed of materials which are not soluble in any liquid. These materials can sometimes be removed through lubrication and suspension. Examples would be copy machine toner or fingerprint dust.

Combination Stains - are caused by substances that have both water soluble and non-soluble characteristics. These stains require treatment of both water based and non-water based cleaners.

[3] Insoluble substance is a substance that cannot be removed with either water or dry solvent base cleaners

Different Spillages: - stains can be caused by materials which cannot be removed using detergent based spotters, however they can be removed through using such processes as digestion or neutralisation. Examples include protein, indicator dyes, rust, etc.

Various Forms of Stains:

Surface stains - Superficial stain, where the staining material is present on the fibre or in-between the fibres. Examples of surface stains are: grease, glue, gum, wax, etc.

Absorbent stain - Penetration of the fibre has taken place and the staining material is present in the fibre. Examples of absorbent stains are: tea, coffee, milk, urine, etc

Compound stains - The staining material is present on the fibre and in the fibre, in other words the staining material is absorbed by the fibre plus it is sitting on the surface of the fibre as well. Examples of compound stains are: lipstick, paint, honey.

Dye stains - Occur as a result of spillage of dyes onto the fibre. The staining material adds colour to original colour of the carpet. Examples are cordials, soft drinks, anything containing dye additives, etc.

Destructive stains - The staining material have altered the nature of the fibre and have caused physical damage to the fibre. Examples of destructive stains are: spillages of strong acids, strong household bleaches, etc.

Factors in Successfully Removing Stains

Age of the stain - Most fresh stains can be removed from the carpet's fibre by an application of appropriate chemical/stain remover. Usually the cleaner is called to attempt the stain removal procedure well after the staining liquid had time to break down the surface tension of the fibre and wet the fibre. After wetting, the stain is usually absorbed by and reacts, with the fibre. Following this reaction the stain dries out and sets on the fibre.

The carpet construction and fibre type also plays an important role in stain removal. Wool fibres are more easily affected by mechanical action. Often after the stain is successfully removed, some pile distortion occurs on the surface of the pile, leaving the treated area quite visible in appearance.

Naturally the **type of stain** plays a very important part in stain removal procedure. For a successful stain removal procedure to take place it is quite important to identify the nature of the stain. There are many stains of unknown origin, therefore it is important for the carpet care professional to develop, cultivate and utilise such senses as sight, touch and smell in order to identify the stain or at least classify it into an appropriate category.

Steps in Stain Identification

- Ask Customer (discuss with customer that not all stains can be successfully removed)
- Appearance: shape, colour,
- Location in the room, the position in the fibre

- Smell - odour of the stain is sometimes the most efficient method of identification
- Texture by using sense of touch
- pH factor

The removal of stains from carpet fibres can be classified into four chemical mechanisms.

Solvent Action - utilises the capability of one substance to dissolve another substance in order to release stains from the fibre surface. This action can be defined as a breakdown of a stain into simpler components, which can be dissolved in the water, solvent or detergent. There are different types of solvents available in the market place:

- Petroleum based solvents
- Synthetic solvents
- Glycol ethers & alcohol
- Citrus4

Caution should be exercised when heating solvents. As the flash point5 is approached, the danger of explosion increases.

Chemical Action which can also be called the action of Lubrication AND Suspension - utilises detergent action to separate soils from surface of fibre. The removal of stains is aided by chemically converting the stain into another form which can be successfully removed from the fibre.

Discolouration or Chemical Change used to correct discolouring caused by altered pH levels or by oxidation. These chemicals work by reacting with and modifying the stain.

Digestion, where enzymes and other natural substances are used. They react with protein and other types of soils by slowly digesting the stain by breaking the proteins down into simple more soluble compounds.

Types of Spotting Detergents Available

Volatile Dry Solvent

- Also referred to as VDS
- They are usually a chlorinated solvent.
- The term “volatile” means - evaporating quickly

[4] Citrus Solvent is the natural organic solvent, which comes from citric oil. It is an effective grease remover. It is commonly used as a spotter for removing of gum, oil or tar. It has a distinct citrus or lemon odour.
[5] Flash point is defined as a temperature at which chemical vapor will ignite when exposed to an ignition source

- VDS are very effective for oil type stains
- These chemicals are very aggressive. VDS may evaporate very rapidly and should be used in well ventilated areas with maximum air flow and by opening doors and windows to increase air flow. Smoking is not allowed while VDS is present as the formation of toxic gases may occur when the VDS is heated.
- The operator should use eye protection, skin protection and an organic vapour mask.
- VDS are effective in removing grease and oily substances such as tars, chewing gum, some paints, some pigments and inks.
- VDS should not be used for overall cleaning of carpet. It should be used for spot cleaning only.
- VDS should only be used sparingly as misuse or overuse may cause a delamination problem. VDS should always be applied to a towel before applying to fabrics. VDS should not be applied directly onto the carpet as it can dissolve latex and rubber components and cause delamination and dimpling of carpet.
- VDS should be used in stain removal procedure following carpet cleaning procedure
- The chemical is safe to use on 4th and 5th Generation Nylon Yarns.
- It is a good practice to re-apply fluorochemical protectors following VDS application, as VDS is capable of removing the protection.

Non-volatile Dry Spotter

- Also referred as NVDS and POG (paint, oil and grease remover)
- These chemicals are used on oxidised oil stains or on dried oil based paints
- NVDS evaporates slower and gives operator more working time
- Same working precautions should be used as per VDS (well ventilated area, protective gear, no smoking)
- NVDS can be a combination of a wide variety of solvents and should always be applied to the towel first, before it is applied to fibre
- NVDS should always be flushed with VDS to avoid leaving residue on the carpet
- While some types of POG can be flushed out with water, they can contain dissolved oils, and as a safety measure it is recommended to always flush it with VDS
- Solvent-based gels are new generation chemicals, which designed to work on stain without quick penetration of the fibre. These chemicals are very effective on old gum spots. Solvent based gels (non-volatile water linked spotters) need to be thoroughly flushed with hot water in order to prevent rapid resoling of carpets' fibre.

Neutral Detergent Solution

- Also referred as NDS
- pH level is 6 to 8

- Should be the first wet side solution to utilise when working with water based substances.
- Will remove many water based stains through a process of mild emulsification

Alkaline Detergent Solution

- Also referred as ADS
- pH level is 9 to 10
- Used to neutralise acids or acid base soils

Acid Detergent Solutions

- Also known as tannin spotters6
- pH level is 2 to 3
- Used for removing browning, water stains, plant stains, such as coffee, tea, grass and also at times on urine and faeces
- Also used to neutralise alkaline type spotters
- It can also be used in helping to stabilise fugitive dyes

Liquid Protein Spotter

- Used on protein stains such as blood, egg, milk, etc
- Has characteristic odour of ammonia. Should be used with CAUTION.

Enzyme Protein Spotter

- Also known Enzyme Detergent Solution
- Enzyme digesters are living organisms that biologically break down protein type soils into simpler components that are more soluble
- Enzyme digesters are most effective in removing persistent protein soils such as blood and other body fluids
- Enzyme digesters are heat sensitive. Are not active in cold or hot temperatures. Best working temperature is around 40-60 °C.

Rust Remover

- Made up primarily of iron oxide
- Most commonly used rust removers are hydrofluoric acid and oxalic acid
- Hydrofluoric acid should be used with extreme care. Very dangerous chemical.
- Burns skin badly - dissolves calcium. Do not allow it to touch skin or fingernails. Use rubber gloves.

[6] Stains caused by coffee and tea are often referred to as tannin stains

- Etches glass or glazed ceramic tiles
- It should always be neutralised
- It should always be rinsed.
- A safer, but slower, alternative is oxalic acid rust stain remover.

Special Treatments

Bleaches

Work by adding oxygen to dyestuffs causing stain to lighten in colour or disappear. They are properly referred to as "oxidising agents".

Chlorine - sodium hypochlorite

Sodium perborate

Hydrogen peroxide - safest of all known bleaches. It is a clear, colourless self-neutralising, oxidising bleach. It should be stored in a dark coloured bottle and kept in a cool and dark place. Can be purchased from chemist or supermarkets. Buy only in small quantities. The product has very short shelf life.

Strippers or Reducing Agents

Take oxygen away from fabric or stain and make them colourless, or lighter colour then the stain.

Rules and caution when working with strippers:

- Work in well ventilated areas
- Lighting should be sufficient to detect slight colour changes
- Stripper should be mixed up fresh each time they are used
- Prepare all chemicals prior to starting the procedure. Mix the accelerating agent and stopping agent with water.
- Always pre-test on an inconspicuous area
- Pre-test the small area of the stain prior to applying chemical all over the stain
- Use the minimum amount of the chemical necessary
- Always work the chemical from the outside towards the centre of the stain
- Do not leave stripper unattended, the action, when it takes place can be very rapid
- When desired result is achieved, stop action by using proper neutralising agent and flush the area thoroughly
- Make sure that you do not accidentally spill chemicals on the carpet

The Spotting Kit

- Container of some sort that contains all items required for the procedure is very important in order to maintain the professional appearance.
- Drop Cloth is helpful in order to contain accidental spills or residue during the procedure
- Absorbent Towelling should be used to absorb small spots after chemical application.
- Bone Spatula or scraper to be used for spot/stain agitation. Use the blunt end of it to agitate in order to provide mechanical action to the stain when applying the chemical. Never use the sharp, pointed end as it can damage the fibre
- Tamping Brush or Spotting Brush is used to promote penetration of the spotting agent into fibres. The Tamping Brush should never be used a scrubbing, brushing or sweeping action. These actions can cause distortion and fussing of the carpet's nap. It should be used with a Tamping Action only.
- Applicator Bottles are easier to use if they have Flip Top, which enables controlled application of spotting agent.
- pH Paper or pH Pen are used to test relative acidity or alkalinity of stain
- Scissors are used to trim fuzz or sprouts from the surface, or to clip sample for fibre testing. "Duck Bill" scissors are most useful.
- Extractor may be used as a rinsing tool to remove large spots after chemical application.
- Rubber Gloves, Safety Glasses and Organic Vapour Respirator (for use with toxic or caustic substances)
- Spotting Chemicals

General Stain Removal Procedures

- Always select the proper agent to be used such as water, acid, solvent, etc.
- Remember that if the origin of stain is unknown you should always start with the Volatile Dry Solvent (VDS).
- Apply spotting agent sparingly, no more than is needed.
- Agitate as required by using a bone spatula or tamping brush.
- Always rinse thoroughly using a towel or extractor.
- Neutralise where required
- When in doubt concerning loose dyes or sensitive fibres or colours, it is advisable to test the chemical in an inconspicuous area of carpet first.
- Not all spots and stains can be removed. Your customer should be informed of that and preferable sign a disclaimer form prior to procedure being started

- Light spots usually cannot be removed with the regular procedure as they are probably the result of colour loss from exposure to substances such bleach, acne medication (benzoyl peroxide), or some other material which has affected the dyes on the fibres. Spot dyeing procedure can be used in these instances (subject to fibre composition)

- Because of the many variables involved with spots/stains caused by protein deposits (urine) they are probably the most difficult ones that can be encounted. Moisture sensors and/or UV lights are useful to locate urine spots.

- Old spots/stains might continue to reappear as the result of spotter/detergent residue that was not rinsed completely, residue of the spot itself, wicking from the backing or some other residue which may be present.

- Rubbing of stains and spots should be avoided at all times, as it causes pile distortion, physical damage to fibre and alters the appearance of the carpet.

- If the wicking of residue is expected when spotting carpet, at the end of the procedure all the residual moisture should be absorbed by using either a weighted towel or other absorbent materials.

Problems Associated With Carpet Cleaning

Over wetting Problems

Most over wetting problems related to carpet cleaning can be directly connected to operator's error. Such mistakes as poor wand technique, poor cleaning preparation, not utilising proper drying systems, etc, often lead to carpet over wetting. Delayed (slow) drying can cause further problems to carpets fibre such as odour, mildew formation, browning of fibre, etc... Over wetting or improper drying of cellulosic fibre is likely to cause browning problems. When assessing or determining any possible cleaning-related problems, fibre content should be tested. In that we mean that the face fibre should be identified as well as the content of the backing or foundation yarn. The knowledge and understanding of these fibres will greatly assist in solving and rectifying of any actual cleaning related problems as well as will facilitate their prevention.

Odour

Can be caused by over wet carpet, which is drying very slowly.

Any odour is a gaseous material that comes from a source. Once airborne to be detected it can and generally will penetrate other substances in the areas, such as curtains, painted surfaces, etc. The source of odour in over wet carpet is related to rotting of organic materials which are present in face fibre. After cleaning a carpet a stale odour might be present. The source of this odour simply comes from the action of micro-organisms. Generally this odour disappears as the carpet dries. A simple perfumed masking agent is often sufficient to eliminate any remaining odour.

The persistent odour caused by severe over wetting of carpet can be eliminated by applying disinfectants. The distinction should be made between perfumed masking and elimination of odour

problem by disinfectants, which are formulated to eliminate the growth of bacteria that causes rotting of fibre. The disinfectants should be applied liberally to carpet surface and agitate vigorously to promote penetration of disinfectant to base of yarns. Most disinfectants (biocides, fungicides, bactericides) are cationic in nature, therefore caution should be used when applying them as the application of cationic disinfectants to “stain resist” nylon carpet voids the manufacturer’s warranty.

Shrinkage

Results from swelling of backing system. It occurs when backing system made out of natural fibres (cotton or jute) is exposed to excess of moisture.

Mildew

It is caused by fungus which feeds on organic matter.

For the fungus to grow successfully, several requirements should be present: Moisture, poor ventilation, poor exposure to natural light, presence of food source (mainly feeds on organic substances only), and warm temperature. Most mould and mildew grows best in carpet at temperatures between 20-30°C. Mildew problems can be corrected by application of disinfectants, which are formulated to eliminate the growth of bacteria that causes rotting and mildew formation in carpet fibre.

Cellulose Browning

Will only occur when the jute backing of the carpet is wet and it will cause the bleeding of lignin cellulose to tips of yarns. This upward flow of moisture on the fibre surface during drying is referred to as wicking.

In order for cellulosic browning to take place several requirements should be present:
Presence of cellulosic material, fibre should be over wet, carpet should take too long to dry. Browning is often worse when using alkaline detergents. Older carpets are more prone to browning as the structure of jute backing tends to become weaker with time, causing browning to occur even with some mild over wetting of fibre. It is easier to correct browning problems on synthetic fibres than on natural fibres. Correction of cellulosic browning can be achieved by using several chemicals: specially formulated acids, application of hydrogen peroxide or by using mild reducing agents. Selected product should be applied lightly to affected areas. It is important to realise that browning problem is a surface problem; therefore it should be applied only on tips of the fibre.

Streaking Of Carpet

Occasionally can look streaky following cleaning. This streaking of carpet will become noticeable during the cleaning process. It is recommended that the technician should stop the cleaning process and check the spray jets and vacuum orifices of the wand for signs of clogging. If this present it should be cleaned and the area of the carpet re-done. Occasionally it can also be associated with improper wand stroking pattern. Practicing of the wand stroking techniques and attendance of training will assist in developing of the correct technique.

Equipment and Safety

- Material Safety Data Sheets (MSDS) should be kept for each chemical carried on the vehicle and taken on site. MSDS sheets should be kept on the work vehicle, must be available to anyone, and can be most helpful in medical treatment in case of emergencies. Each chemical transported to a job site must have MSDS.

- In addition to Material Safety Data Sheets (MSDS) for maximum operator safety equipment such as splash goggles, vapour/particle respirators, chemical resistant gloves, PVC boots, eye wash/bath, etc. must be readily available on the work vehicle.

- Equipment should be wiped down/cleaned after every job.

- To prevent possible carbon monoxide poisoning or even death, the exhaust from all internal combustion engines should be vented well away from doors and windows, preventing exhaust fumes from entering the building.

- For operator safety the third (ground) prong on an electrical plug should never be removed.

- If using a system that burns propane as a fuel, the propane fuel tank must be mounted outside the work vehicle.

Helpful Tips to Remember:

- Most cleaning related problems can be prevented by an accurate pre-inspection of areas to be processed and by explaining to the customer, step by step, what will be done to the carpet, how it will be done and how the carpet will look following the procedure.

- Technician should recommend that customers stay off damp carpets as much as possible in order to:
  - Prevent soil tracking.
  - Prevent slipping and falling hazards.
  - Promote health and safety of children and pets.

- Upon completion the technician or the crew chief should conduct a walk/inspection of the job initially on their own and then together with the customer to ensure their satisfaction.

- Dry vacuuming of carpet is the first step in any type of carpet cleaning. This should include at least 8 passes over the carpet in the heaviest build-up area (usually only 2-4 steps in the door). Fewer passes will be necessary as you proceed further into the building.

- Preconditioning of carpet, which is a chemical distribution by agitation may be accomplished with manual action or with a use of rotary shampoo machine. The procedure should be started at the furthest point from which you will exit.

- Filtration soiling are dark lines sometimes appearing in doorways and along baseboards. They are associated with air pollution and require agitation for effective removal. However, in some cases it cannot be successfully removed as filtration soiling along walls and under doors may permanently alter carpet appearance.

- In order to facilitate cleaning all furniture should be moved.

- Furniture should be replaced on blocks and/or tabs following cleaning. They should be used in order to prevent rust and/or furniture stains formation.

- Carpet should always be groomed following any type of cleaning and application of topical agents, as it enhances the appearance of carpet as well as speeding up drying time.

- The best initial action to take on carpet that develops ripples during cleaning is to inform the customer and wait until the carpet is dry.

- Recovered waste water must be disposed of in a sanitary sewer line which will provide waste water treatment and in accordance with Section 6 (Disposal of Extracted Cleaning Waste) in Australian/New Zealand Standard (AS/NZ 3733:1995).

Restoring Colour to Faded Areas

Colour Restoration is used to restore lustre, brightness and colour to dull appearing carpets. Colour restoration is the service dealing with the maintenance of the colour of installed carpet. Many will confuse this service with on location carpet dyeing. In the on location dyeing service, the technician is called upon to change or alter the colour of the carpet, either by making it darker or by moving into an entirely different colour family. In the colour restoration service, the technician is asked to return faded or discoloured areas back to the original colour, to preserve and maintain the original carpets colour. Colour Restoration Services are applicable to both domestic and commercial property carpets and upholstery and can be done following either steam or dry cleaning.

Colour Restoration chemicals are specially formulated to maintain and restore the colour of the carpet. They are **NOT** meant to change the colour of the carpet, but to **RESTORE** it.

Carpet colour deterioration start from the day a carpet is installed. The loss is due to the action of light, traffic and atmospheric contaminants that have worked their way into the fibres to take effect. At this time the rate of colour loss is accelerated and the carpet will lose more colours, faster. If the carpet is found in an industrial area or near high automobile traffic areas, the build-up of contaminants is even greater. It increases the amount and rate of colour loss. The loss is gradual and initially not noticeable. Over time you and your customers will notice that the carpet has lost its lustre and appears dull and lifeless. Areas of heavy foot traffic will have lost even more colour.

There are two aspects that influence a carpet condition:

- soil condition

- colour condition

It is well known that regular scheduled cleaning will maintain a high level of cleanliness and reduce fibre wear in carpets. Merely cleaning a carpet will not prevent this colour loss from occurring. Only the use of COLOUR Restoring agents can restore the colour of a carpet. COLOUR Restoring agents are suitable for use on Advanced Generation Fibre. The Carpet Colour Maintenance Program should be initiated the first time a carpet is cleaned following its installation. The program should be continued at regular intervals as the optimum maintenance program for carpet colour.

The Colour Maintenance Program ensures that optimum level of carpet colour is maintained throughout the physical life of the carpet fibre. This will give you regular consistent earnings, in contrast with the sometimes inconsistent cleaning business, as all carpets require colour restoration on a regular basis.

Application of the colour restoration agents dramatically improves the appearance of faded carpet immediately. The restored colour is permanent. It is applied on the carpet in even overlapping strokes by using pump up or electrical sprayer. It sets after the first 15 minutes and will not come off on white socks. The restored colour will continue to fade at the same rate as a manufacturer's dyed colour.

You are now in the asset maintenance business, protecting and expanding the useful life of an expensive asset. Every time the wool, nylon or blend of wool/nylon carpet is cleaned, colour restoration agent should be applied to insure that the colour of the carpet is restored and maintained.