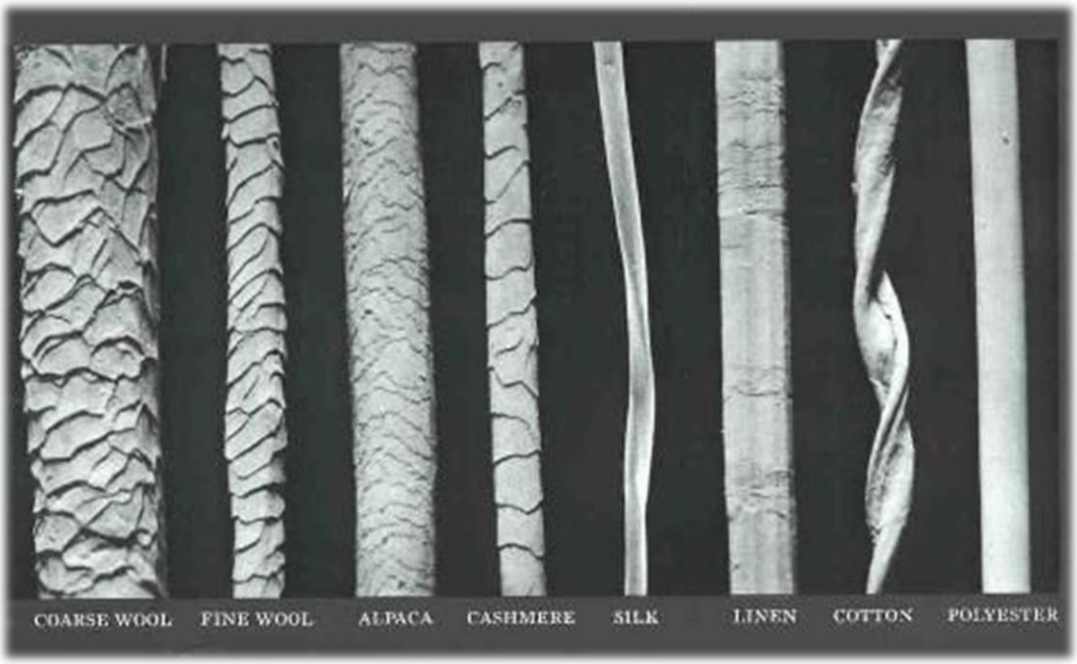
CARPET CLEANING

An Introductory Course



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Training Overview

This course covers the basics of carpet cleaning and will provide you with the basic techniques of carpet cleaning allowing you to start a carpet cleaning business.

We will cover everything you need to know such as;

- Fibre types
- Fibre identification
- Construction of carpets and rugs
- Chemicals and solution use
- Systems and equipment you need and,
- The procedure to undertake

This training course predominantly concentrates on hot water extraction methods. The extraction method of carpet cleaning is recommended by the vast majority of carpet manufacturers worldwide.

This course gives you a basic outline of what then links into our specialised course; Spot and Stain removal. Everything you learn here today will allow you to start a successful carpet cleaning business. If you are ever stuck or need more information, Carl is always on hand for any advice you may need!

Fibre Types

Protein Fibres

Wool

Both luxurious and hard wearing, wool is one of the most popular carpet types. Wool is soft, a pleasure to walk on, and is also naturally flame retardant.

Characteristically wool is quite good at hiding a soil load when used in a carpet. It is also fairly resistant to water-based soiling, has good oil soiling resistance, and is easily cleaned. Other types of animal fleece may be found in carpets and rugs, though this is rare.

Examples of these would be Mohair, Alpaca, cattle etc. Wool can absorb approximately 30% of its weight in water - this is a pertinent point for carpet cleaners.

Ideally our cleaning needs to be pH neutral and for wool safe – a high pH may be required in certain circumstances.

Silk

Silk is a soft and luxurious protein-based fibre, extracted from silk moth larvae in a single filament (versus wool which is spun into a yarn). Silk is very rare in carpets and is more usually found in high value soft furnishings such as oriental rugs, curtains, and (though this is rare) upholstery. Silk is easily damaged by detergent based alkaline cleaning chemicals and must be thoroughly tested for dye stability. Silk is quite absorbent but concurrently does not react like wool when wet and needs to be hand finished if wet cleaned. Ideally dry clean or vim pH neutral clean

Natural cellulose fibres

Cotton

Cotton is more often found in the foundation of carpet as part of its construction. It is ubiquitous in the warp and weft construction of oriental rugs and in rug fringes.

Cotton is most often found in upholstery and curtain fabrics. Cotton is used in upholstery as it is soft to touch, takes dye well, cleans well with pH neutral or acidic cleaning agents.

Cotton is highly absorbent taking up to 100% of its weight in water and wants to remain wet (it is after a plant fibre), because of this cotton is prone to issues such as cellulose browning.

Viscose

The best way of describing viscose is that it is made of paper. As such viscose absorbs up to 110% of its weight in water and generally cannot be wet cleaned.

Viscose is made from wood pulp that is chemically treated with caustics and pressed into a continuous filament fibre.

It is weaker when wet and can be damaged by **acids. It is also prone to cellulose browning.** Dry clean, pH neutral or acidic cleaning.

Jute, Seagrass & Sisal

The above are all plant fibres that have different characteristics and textures, but all must be cleaned using a low moisture or dry compound cleaning system.

These carpets are rare enough in a domestic environment and cannot be cleaned using wet extraction methods as they are prone to shrinkage and disintegration.

Jute, in particular is quite common in the foundation yarn of carpets and it is imperative that we don't wet the backing of these carpets when we clean them as they are prone to shrinkage, dye bleed, and cellulosic browning. Dry clean only.

Synthetics

Nylon

Nylon is one of the most popular carpet fibres and is found in both domestic and commercial environments especially 80/20 wool blend carpets.

It is a hard-wearing fibre; however, Nylon tends to 'cling' to oil based soiling.

A micro splitter or high pH detergent is ideal.

Polypropylene

Polyprop is a hydrophobic fibre that is seen in both commercial and domestic environments.

It is manufactured by melting the dye into the fibre during manufacture as it will not take a dye once it is made (solution dyeing).

Polyprop is easily damaged by heat (i.e.: friction or direct heat).

It is not a very resilient fibre and crushes and flattens easily.

Polyprop attracts oil soiling as such it stains easily from grease and oils. A micro splitter or high pH detergent is ideal.

Polyester

Polyester is another oil loving fibre commonly seen in domestic environments.

It is easy to clean and quite durable.

Like polyprop, it has poor resilience, the yarn flattens and matts, and is easily stained with oil-based spills.

A micro splitter or high pH detergent is ideal.

Acrylic

Most like wool in appearance of the synthetic fibres.

It is difficult to clean and an expensive fibre. Acrylic is more common in textiles.

A micro splitter or high pH detergent is ideal.

Important Information

It is important to identify the carpet type as **many chemicals are designed to clean either natural fibres or synthetics**. Hence the WOOLSAFE symbol.

Wool can be adversely damaged by the wrong choice of chemical, as can cellulose fibres and seagrass. Synthetics will tolerate a lot more. A micro splitter or high pH detergent is ideal.

Fibre Identification Burn Chart

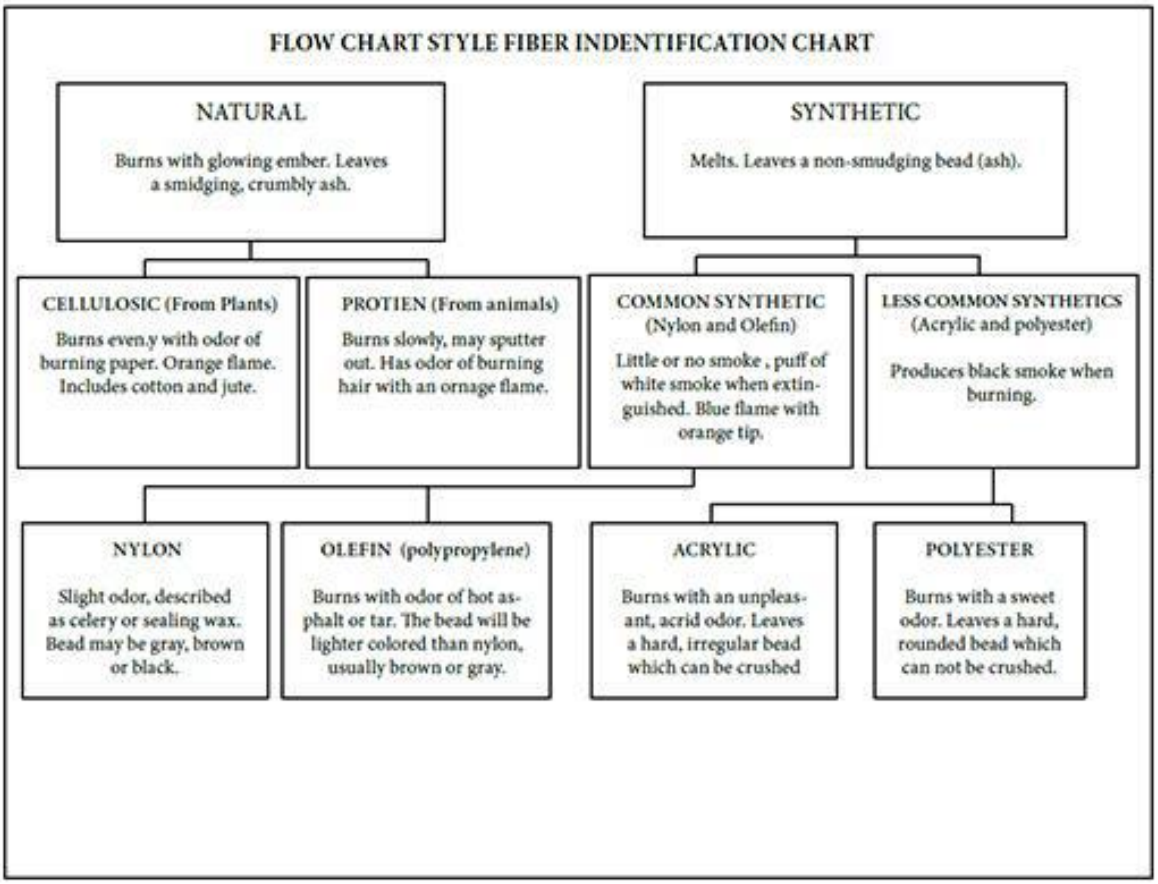
If you are unsure about a fibre type and which product to use, you must test the fibre visually to ascertain its type.

The most common methods for fibre identification, failing a visual identification, are burn tests using a lighter. Do not use matches as the sulphur flame can be interpreted incorrectly.

Burn tests are not definitive and one should practice on known sample to see the results.

Please see the burn chart to identify the most common fibre types.

Fibre	**Burning Characteristic**	**Flame**	**Smoke**	**Odour**	**Ash or Bead**
Wool	Burns slowly, shrivels, self-extinguishing away from flame	Does not flare up, orange flame	White	Burning hair	Black bead crumbles to ash
Nylon	Shrinks away from heat and melts	Yellow/Orange and blue at the base	White	Candle wax or celery	Hard, light-coloured bead
Polyester	Melts and shrinks from heat	Red/Yellow	Dense Black	Candle wax or Celery	Hard, light-coloured bead
Polypropylene / Olefin	Melts and shrinks from heat	Blue at base, orange at tip	Grey	Tar like	Dark hard bead
Cotton and Jute	Burns quickly	Yellow/Orange	White or grey	Burning paper	Soft grey ash
Viscose Rayon	Burns very quickly, perhaps “explodes”	Yellow/Orange	White	Burning paper	Soft grey or white ash
Acrylic	Burns and melts	White-Orange flame	Black	Burned meat	Hard, dark bead
Silk	Small, brittle beads	Does not flare up	White	Burning hair or feathers	Soft crumbles to ash



Perform a burn test by taking a sample from the corner of a carpet, cut off a few loops. Have an ash tray or other vessel for the test. Your customer may have a carpet cut off or remnant from which to glean samples.

Light the sample, watch the flame, waft the smoke toward you, observe the resultant bead / ash.

Compare your results to the chart. Most of the synthetics will burn to a plastic bead so it is the other characteristics you should use to determine the type.

❖ What colour was the flame?

❖ how did it smell?

❖ What was the colour of the bead or ash?

80/20 wool synthetic mixes are common so you will get a mix of characteristics.

Carpet Construction

There are a myriad of carpet manufacturing methods using many different fibre types in both the backing and face yarn. It is important to identify the different construction types and face piles used as this will dictate the cleaning system chosen.

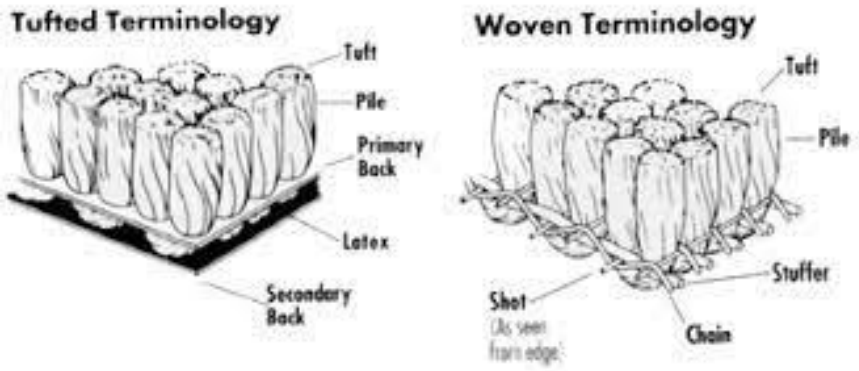
The most common type of carpet available is of tufted construction where a synthetic backing has had the yarn stitched to this and held in place with adhesives.

Woven carpets

The two most common types of woven carpet are Axminster and Wilton. These carpets are woven together including the backing which has two yarns usually warp and weft of cotton and jute. The face pile is then comprised of one or two other materials (for example an 80/20 wool/poly).

Identifying if a carpet is woven is quite important as the cotton and jute can shrink if they become wet.

Over wetting can result in browning from the foundation fibres.



Tufted Carpets

Tufted carpets are the most common type of carpet construction in a residential environment. Face yarns can be natural or synthetic, cut or loop pile with various pile lengths available.

The backing is usually a pre-manufactured woven fabric and in most cases is synthetic though jute can often be found. Rows of tufts are sewn into the backing in one yarn, then these rows of tufts are glued in place. A secondary backing is then glued on to the primary to stiffen the construction. This method is for looped pile. If a cut pile is required, the yarn face is sheared.

Flocked Carpet

Nylon face fibres are glued to a solid vinyl back. These fibres are actually white and the patterns and colours are printed onto the face once construction is complete.

These carpets can have 70 million fibres PSQM making them exceptionally dense. This also means they can hold a huge amount of soil.

Commercial Floor Coverings

Commercial glue down carpet or carpet tiles are not strictly classified as carpets. They have varying construction methods and are typically synthetics. They can be fibre bonded, bitumen backed, needle punch etc. These floors coverings are quite thin and have separate cleaning requirements to normal carpet.

Pre-Clean Inspection

The most important part of your cleaning process is your carpet inspection. The inspection will provide you with the information needed to clean the carpet properly and with the appropriate chemical matrix.

Ask the customer questions to ascertain the carpets history and usage. Ask about the carpets use, age, individual stains etc. You need to know if a stain such as fake tan, teas, coffees, wines, pet staining, vomit, faeces, etc. are present (which in some cases may not be removable).

Good questions to ask are;

1. Have you owned this carpet from new or was it in the house when you moved in?
2. Has the carpet been lifted for any reason and if so, was it professionally re-fitted?
3. Do you know what (if any) the various stains are?
4. Do you have pets?
5. Are there any areas which are of particular concern?
6. Has the customer used any other home remedies or retail products in an attempt to remove stains?

The inspection may raise other questions and as you progress as a carpet cleaner you will know what questions to ask your clients.

To identify the carpets construction, you will need to lift a corner in order to inspect the backing.

Face fibres may need a burn test to ascertain the main fibre.

If the client has an offcut or remnant available this will make your job easier.

Part of the inspection will also include checking if the carpet is fitted correctly. Check around edges, doors, radiators and joins.

Qualify if there are heavily soiled areas and check for dye bleed from previous cleans.

Bring any issues to the customers /clients' attention - waiting until after you've cleaned a carpet to highlight issues can often be seen as an excuse whereas highlighting issues beforehand is the professional approach.

Based on your inspection, decide which solutions you are going to use, AND it is paramount that you test for dye bleed using the chosen cleaning agent.

Testing

- ✓ Rub the carpet with a dry white cloth to test for transfer
- ✓ Rub the carpet with a wet cloth to test for transfer
- ✓ Apply your chosen cleaning solution to test for transfer
- ✓ Identify the face yarn type and the type of soil the carpet is covered in - this will dictate the chemicals you are going to clean the carpet with.

Ph - Acid and Alkaline

pH is quite complex but for the purposes of carpet cleaning there are some basic fundamentals that apply.

- ❖ Soils are either acidic or alkaline.
- ❖ Cleaning products are either acidic or alkaline.
- ❖ The pH scale numbers 1 to 14 with 7 being pH neutral
- ❖ 0 is highly acidic
- ❖ 14 is highly alkaline

The scale, however is not linear. And each whole unit is stronger to the power of 10 than the last - this means that pH 6 is ten times stronger than pH 7, pH 5 is 100 times stronger than pH 7. The same is true on the ascending scale.

Carpet soiling tends to be around pH 5 - acidic, so concurrently it makes sense that carpet cleaning solutions should be alkaline in order to neutralize them.

Detergent free processes work in a different way and don't rely on pH to clean.


Concentration of Hydrogen ions compared to distilled water
Examples
10,000,000
pH 0
Battery acid
1,000,000
pH 1
Hydrochloric acid
100,000
pH 2
Lemon juice, vinegar
10,000
pH 3
Grapefruit, soft drink
1,000
pH 4
Tomato juice, acid rain
100
pH 5
Black coffee
10
pH 6
Urine, saliva
1
pH 7
"Pure" water
1/10
pH 8
Sea water
1/100
pH 9
Baking soda,
1/1,000
pH 10
Great Salt Lake
1/10,000
pH 11
Ammonia solution
1/100,000
pH 12
Soapy water
1/1,000,000
pH 13
Bleach
1/10,000,000
pH 14
Liquid drain cleaner

Carpet Cleaning Chemicals and Solutions

Detergents

Most detergents are high alkaline and require a neutralizing agent to emulsify and remove the pre-spray along with the soil. It is not unusual to have a number of different rooms in a house made up of different fibre types and different soils which can pose a problem for detergent-based cleaning solutions.

Whilst detergents are indeed effective at cleaning carpet. They come with risks provided by the high alkaline characteristics (such as dye bleed and cellulosic browning) and generally tend to leave residues in the carpet which attract soil at an accelerated rate. Detergents are also good for synthetic carpets and problem solving.

Detergent Free

Detergent free chemicals are newer more advanced cleaning solutions which strive to eliminate problems caused by detergents.

Detergent free solutions are far less volatile and far less likely to give rise to issues with those sensitive to chemicals (for example asthmatics).

Most detergent free carpet cleaning solutions can be used on any type of fibre, any carpet construction, as well as rugs, and upholstery. They can be used with bonnet systems and wet extraction systems.

Detergent free solutions are free rinsing, meaning they can be rinsed from carpet and upholstery with just plain water leaving no residue in the fibres.

Most detergent free solutions are derived from eco-friendly plant or food grade components. They are eco-friendly and work more effectively than detergents.

As detergent free chemicals are low pH or pH neutral, they are suitable for most natural fibres.

Type of Cleaning Products

Detergents

Detergents break down the active energy of a fibre and make it easier to wet the structure. They can help encapsulate the soiling and prevent it from reattaching making it easy to rinse away. There are 3 classes of detergents:

1. Cationic: Positively charged detergents that help remove soil that is negatively charged. Soot and carbon are an example of such
2. Anionic: Most soiling has a positive charge so using a negatively charged (anionic). These detergents are usually quite foamy so when using the extractor, don't forget to add defoamer to your waste tank. Usually, shampoos are the main culprit for this.
3. Non-Ionic: These detergents are generally low foaming and have neither a positive or negative charge. This is the category that most of your good carpet cleaning products fall under.

Colloids

Colloidal cleaners have electrical charges that are greater than the forces holding the soil in the fabric. This results in the soiling being magnetically attracted to the solution and pulled away from the surface. They are highly concentrated and biodegradable. There is a dwell time required and they are effective on oily soiling. Agitation of a colloidal cleaning solution while in contact with the dirt to be removed will increase its effectiveness and speed of action. They are great on wool and natural fibres and will neutralise odours.

Enzyme cleaning agents are used as pre-treatments for any protein-based soiling. Enzymes are living organisms that break down the protein molecules in the soil and work best at a temperature range of 45°c to 65°c. Enzymes must be flushed out of animal fibres as they will literally eat the fibre.

Micro splitting Detergent Free Cleaning Chemistry

This method of detergent free cleaning is free from synthetic surfactants. The ingredients are normally sodium based.

They emulsify and suspend soil in a solution and work on contact at a nano-particulate level splitting the soils bonds. Molecular chains that are differently charged are broken down and split into colloidal particles and that is what this bond consists of. Once the bond is broken, the soil dissolves absorbing moisture from the atmosphere. This is known as hydroscopic function and ensures the soils do not reconstitute. This makes it easier to remove using a fresh water rinse using an extraction machine and they leave next to no residue.

Microsplitters are free of volatile compounds thus leaving them safer to use for the environment and not harmful to humans or animals.

Systems And Equipment

Hot Water Extraction (HWE) or Rinse Extraction or Wet Cleaning

Rinse water is injected into the carpet through the high-pressure system and is vacuumed back. The majority of carpet manufacturers worldwide recommend the HWE system, hot water extraction, wet cleaning or rinse extraction.

The system is simple - you have a truck mounted extraction machine or portable extraction machine with two tanks, fresh (solution) and waste water tanks.

Machines have a vacuum motor and a water pump which are connected to pressure and vacuum hoses which in turn are connected to a carpet cleaning wand or attachment.

The machine is designed to spray and inject water across the carpet fibres and extract the water back into the machine along with the suspended soil.

Equipment ranges from small (and unsuitable) D.I.Y rental machines, (Karcher, Nilfisk) right the way up to truck mounted engines (Prochem) with massive amounts of power. Most operatives opt for a decent portable machine capable of running significant hose lengths.

The method is simple;

- ✓ Pre-spray your chosen solution on the carpet
- ✓ Agitate to break down and loosen the soil
- ✓ Extract

Bonnet Cleaning

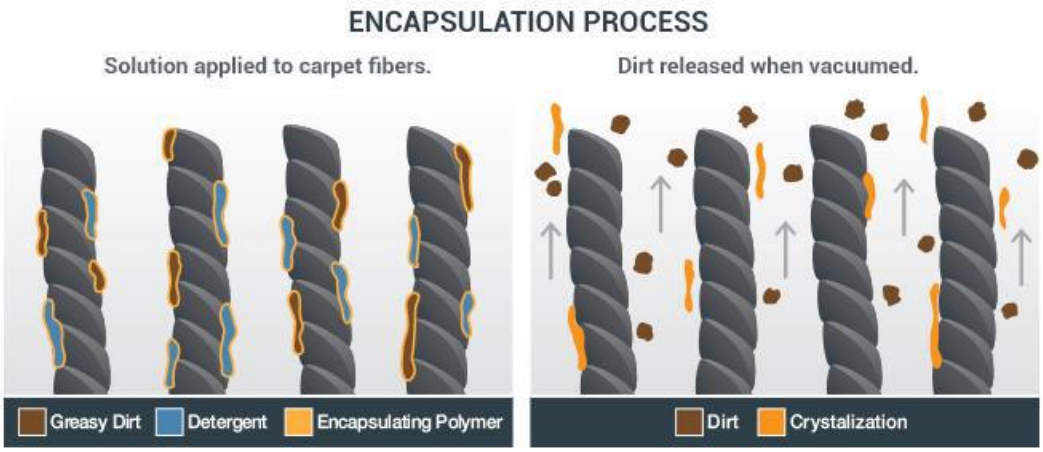
Bonnet cleaning is a popular carpet cleaning method for office or commercial environments. Whilst it is an efficient method of carpet cleaning it is not as thorough as rinse extraction.

The method is to pre-spray the carpet with your chosen solution. The operator then agitates the carpet with a low-speed rotary breaking down and absorbing soil.

The system is exceptionally fast but is limited to low soil environments.

Encapsulation

This is similar to bonnet mopping but instead of using a bonnet mop a brush or synthetic agitating pad is used.



A blend of encapsulating polymers “grab” hold of the soil at a microscopic level. When the carpet has dried, it is then vacuumed to remove the encapsulated soil.

Pad Capping

A process called pad-capping incorporates the characteristics of bonnet mopping and encapsulating in one process.

The process is a little slower than bonnet mopping as a vacuum stage must be incorporated post cleaning.

Dry Compound Cleaning

VLM or dry compound cleaning is a process in which a powdered compound is applied to the carpet, mechanically brushed in, then vacuumed out carrying the dirtied ‘sponges.’

The ‘dry’ powder is not wholly ‘dry’. It consists of a carrier material infused with a cleaning agent usually a microsplitter.

The process is only suitable for maintenance cleaning and can be done whilst people use the carpet.

This process can also be used on fibres which are unsuitable for any form of wet cleaning, such as Natural Fibre carpets.

The ‘dry’ powder is not wholly ‘dry’. It consists of a carrier material infused with a cleaning agent usually a microsplitter which is used to “boost” performance.

The process is only suitable for maintenance cleaning and can be done whilst people use the carpet.

This process can also be used on fibres which are unsuitable for any form of wet cleaning, such as Natural Fibre carpets.

A typical CRB machine set up

Carpet Cleaning Procedures

The same basic procedures are to be followed for all the methods mentioned:

- ✓ lnspect, ID, test
- ✓ Address issues and questions
- ✓ Dry soil removal (vacuum)
- ✓ Stain treatment
- ✓ Pre-spray & agitate
- ✓ Flush (extract)
- ✓ Pile brush & dry

Earlier we discussed the first two points in depth so we can now move directly to:

Dry Soil Removal - Vacuuming

This is perhaps the most essential part of the process. This is because 80-90% of a carpets soil load is dry particulate soiling – basically grit and dust. The carpet will be harbouring huge amounts of dry soil in the base fibres and if the operator does not remove this soil the introduction of moisture will turn to mud at the base of the pile.

The preferred tool is a commercial grade upright vacuum cleaner with a motorized brush head to “open up” the yarn and allow soil extraction.

Rush this stage at your peril.

Improper or insufficient dry soil extraction can result in wick back and an unsuccessful clean. The operator will then have to spend far more time rectifying the issue - one which should not have occurred in the first place.

The vacuuming stage is also a great opportunity to assess the soil levels and begin pre-treatment of spots and stains.

Stain Treatment

It is recommended to pre-treat spots and stains before you begin pre-spraying the carpet.

The stain type will dictate the product chosen to tackle the stain. Though if the stain is unknown, it is best to start with a solvent spotter first, then alkaline then acid. If these fail more specialist work is required. E.g peroxides and reducing agents.

Pre-Spraying & Agitating

This is where the process of transforming a carpet really begins. Pre-spraying is designed to soften and loosen soiling from the carpet fibres enabling the operative to rinse it out using your extraction equipment.

The process is three-fold:

Pre-spray your chosen solution onto the carpet hot

Agitate the solution into the fibres with a CRB or rotary machine

Then allow the solution to dwell

The acronym for this is C.H.A.T. Chemical, Heat, Agitation, and Time.

Agitation must be done as soon as the room is pre-sprayed. This distributes the solution around the yarn and shears soil from the yarn. A CRB is best for the task. If the carpet begins to dry during this step, apply more solution.

Allow the solution to dwell for the appropriate time, then move on to the extraction phase.

Wet Extraction

It really is as simple as it sounds, but this is the most intensive restoration part of the clean. The carpet extractor sprays water under pressure directly at the carpet suspending the loosened soil. The vacuum of the machine then pulls it out and sends it to the waste water tank in the machine. It is wise to perform extra drying strokes to facilitate rapid drying.

Brush the carpet pile to remove wand marks, then employ the use of air movers to dry rooms.

Spots And Stains

Spots and stains differ. What we mean by that is their make-up is fundamentally different and they require different approaches to remove. This course will cover the basics of spot and stain removal, but it requires more training and experience to become good at it.

Both spots and stains should be treated as a separate job to normal carpet cleaning.

Often you will be called out to clean a carpet only to find that it actually is a stain that the customer wants removed.

Removing stains or dyes can be difficult and time consuming and results should not be guaranteed

Spots

Spots are by their nature easy to remove.

They are generally concentrated soils that are easy to remove. Generally made up of sticky deposits of sugar, oils, foodstuffs and general grime.

With appropriate treatment they are readily removed and do not pose and significant issue.

Stains

These are generally foreign colours or dyes that have impregnated the carpet and require further chemical intervention to remove.

Not all stains will remove but there is a myriad of products specifically designed to address common stains.

Stain removal techniques include tamping and spot removal with cloths. Never scrub a stain as this can inflict damage on the carpet.

Categories of stains

There are 3 different types of stains:

1. Absorbed stains
2. Built up stains
3. Compound stains

Useful questions to ask:

- What the spot is?
- Have they tried to remove it and if so with what?
- How long has the stain or spot been there?

1. Absorbed stains are absorbed into the fibres and can be difficult to remove. Most beverages like tea and coffee can be used as an example of this. It is on Natural fibres this is more likely to occur. Synthetic stains would be prone to absorbing greasy stains which can cause a yellowing in the fibre

2. Built up stains sit on the surface of the fibre; synthetic fibres are more likely to see this build up as the absorption rate is much lower. They can be simple to remove and examples of built-up stains would be tar, chewing gum or mud.

3. Compound stains are a mix of both absorbed and built-up stains. Therefore, the stain could be both absorbed and built up on the fibres. Make-up, blood and paint would be an example of such. As such these can be difficult to remove as you are dealing with absorbed stains.

Spot and stain removal

- Test your chemical in an inconspicuous area
- Recognise your limitations and be prepared to tell the customer before you treat
- Ask the questions in the categories of stains section, this will allow you audit correctly

Know your application methods!

1. Pre testing with a spotter and cotton bud 2. Using bone spatula to remove a dry spot 3. Sprayer application 4. Pipette application 5. Indirect application	6. Blotting 7. Tamping 8. Spoon 9. Brush

Drying

The final part of your carpet cleaning regime is drying and grooming; a much overlooked but essential part of the carpet cleaning process.

There is virtually zero chance of dry vacuuming all soiling out of a carpet, even when employing best practise methods.

Traffic areas especially, can wick back resulting in an unsightly browned out effect. A key element to mitigate activated soil wicking up is rapid drying.

This is primarily achieved by the extraction machine being used but in a lot of cases a snail drier or Dri-Pod is essential to get carpets dry quickly and negate any risk.

When you have your dryers running in the areas you have cleaned, brush out your carpet wand marks with a carpet brush.

You are now ready to do your customer handover.