

The No BS Cleaning Seminar



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This manual is designed to give the new technician a jump start in the field. We have taken the highlights of several manuals (carpet, fabric, spotting, and deodorization) and given you the need-to- know information required to stay out of trouble. This is not meant to take the place of classroom instruction and we hope to see you in a class soon. Until then use this manual to go out and safely and profitably clean carpet and fabrics.

Be sure to look over the Jon-Don Resource Center for other manuals and videos. www.jondon.com

Fibers

How a carpet performs in a home depends on many things: the carpet construction, the yarn construction, the type of installation, the quality and frequency of maintenance, the type of cushion used and the type of fiber used. Each fiber has different characteristics that do not change as the style of carpet changes. How the fiber repels or attracts various soils and stains affects the cleaning results.

How a fabric performs also has to do with construction and how it is used. Fabric differs from carpet in the thickness, type of backing and durability.

Fibers are broken into three major categories:

Natural - derived from plants or animals.

- Protein – Wool, Silk
- Cellulosic – Cotton, Jute

In fabric over 50% of what you see daily is either a natural fiber or blend

Synthetic – derived from petrochemicals.

- Nylon
- Olefin
- Polyester/PET
- Acrylic
- Triexta/Corterra PTT

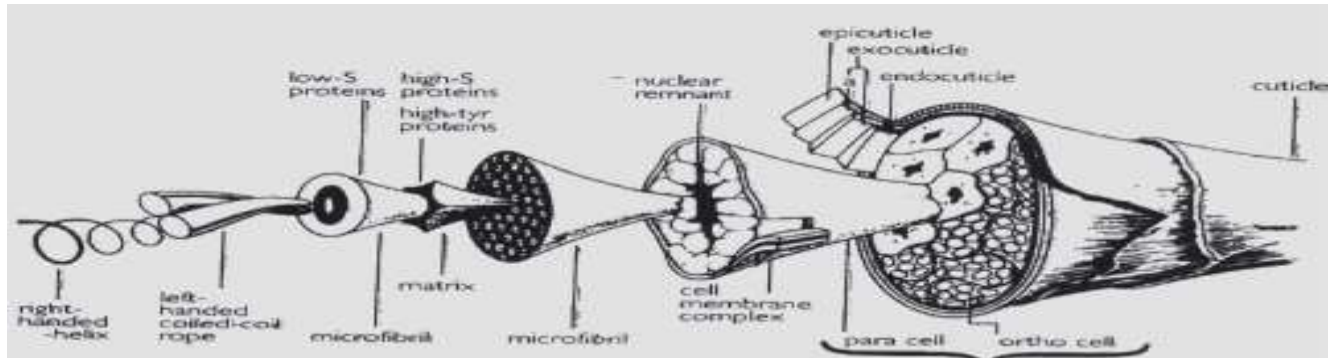
In carpet 99% of what you see daily is synthetic

Manmade – according to the Federal Trade Commission this category is a manufactured fiber made of regenerated cellulose. (**Clean like cotton**)

- **Rayon** → **BIG TROUBLE**
- Acetate

Natural and synthetic fibers differ in their ability to **absorb** moisture. Natural fibers have a high absorbency rate while synthetics have a low absorbency factor. This affects how the fibers are dyed and how easily they are stained. One additional concern is drying time. **Natural fibers normally take longer to dry.**

Wool is obtained from the fleece of sheep.



Characteristics:

- Oldest fiber used in carpet and rugs
- Naturally resilient
- Good abrasion resistance
- Dyes easily
- Cleans well – clean between pH 4.5-8.5
- Natural soil resistance, releases soil easily
- Natural protective membrane repels moisture
- Natural fire resistance



Concerns:

- ✓ **pH above 8.5 can damage outer layer (epidermis)**
- ✓ **Chlorine bleach (sodium hypochlorite) dissolves wool**
- ✓ Stains are very difficult to remove
- ✓ Bleeding and crocking are more of a concern
- ✓ Aggressive agitation can damage epidermis
- ✓ Expensive
- ✓ **Temperature above 160 may damage**

Wool is expensive, luxurious and the standard for all carpet. It can be cleaned safely by using mild detergents, (Wool Safe approved) moderate heat and speed drying it.

Silk – is normally found in rugs, fabrics and draperies.



Moth



Caterpillar



Cocoon

Characteristics:

- Obtained from silkworm
- Most luxurious fiber
- Soft hand

Concerns:

- ✓ Yellows with age –**doesn't remove with cleaning**
- ✓ **Spots easily**
- ✓ Texture distorts easily **clean in one direction**
- ✓ **Damaged by high alkalinity and perspiration**
- ✓ Rayon is used as a low priced alternative

Silk should only be cleaned by experienced technicians. It must be cleaned with mild solutions (neutral to acidic) must be wet evenly and only in the pile direction.

Cellulosic Fibers

Cotton – the most popular fiber in the world.



Characteristics:

- Dyes easily
- Great hand (feels soft)
- Frequently blended with other fibers

Concerns:

- ✓ Easily browns
- ✓ Shrinkage
- ✓ Stains easily



(Matrix Accomplish) followed by an acid rinse (Matrix All Fiber Rinse) is best on any natural fiber. (Matrix Radiant) is the safest of any product for natural fibers.

Linen – is derived from the stem of the flax plant.

Characteristics:

- Natural linen has a light cream to dark tan coloring.

Concerns:

- ✓ Easily browns
- ✓ Shrinkage
- ✓ Stains easily
- ✓ Resilience worse than cotton, turns brittle with age
- ✓ Poor abrasion resistance especially around arms
- ✓ Turns darker when wet, turns lighter as it dries

Linen should be cleaned as cotton with special attention to the arms that may contain weak yarns.

Man-Made Fibers

- ✓ Rayon – the first man-made fiber. It was designed to replace silk. **Fabrics and rugs labeled art silk are really rayon.** First produced in U.S. in 1910. Also called *Viscose*

Concerns: all the problems of cotton

- ✓ **Shrinkage**
- ✓ **Bleeding**
- ✓ **Browning**

Rayon should be cleaned as cotton. Pin the skirts. BE CAREFUL.

Cellulosic fibers can be more difficult to clean due to their absorbency and their tendency for shrinkage and browning.

The key is to use products that have been formulated with a lower pH and less wetting agents.

Before cleaning any natural fibers, be sure to do a colorfastness test with the most alkaline product you will use. Also a burn test will tell you if you have a cellulose, protein, synthetic, or a blend.

This will clue you into the method and chemistry that will be safest to use.

Don't guess unless you want to decorate your home with your customer's furnishings and rugs.

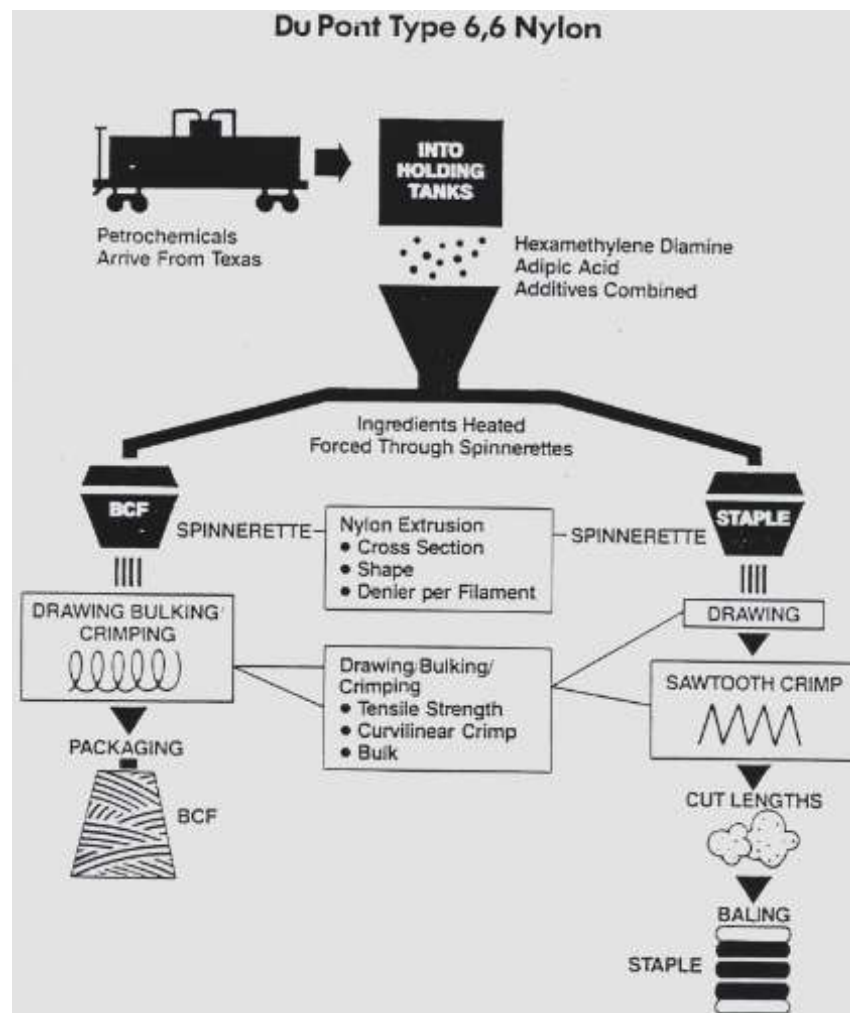
TEST, TEST, TEST!!!



When in doubt about colorfastness use (***Matrix Radiant***) as a dry foam with a natural sponge or horsehair brush.

Synthetic fibers comprise over 95% of the fibers used in the manufacture of carpet.

All synthetic fibers are manufactured the same way – fiber **extrusion**. Polymer chips are blended and heated to a liquid form, then forced or extruded through a piece of equipment known as a **spinneret**. Spinnerets contain hundreds of tiny holes, which determine the **cross section** of the fiber. The fibers are then cooled in a cooling tower and become solid **filaments**. Each hole in the spinneret produces a filament of fiber. The filaments are then drawn, crimped and stretched and bulked, resulting in **BCF** – **bulked continuous filament**, which is wound onto cones and shipped to a yarn facility. The fibers can be cut into 6-8 inch lengths after the drawing process and baled for shipment to a spinning mill. This is referred to as **staple** fiber and staple is produced from the bales.



Nylon – the most popular fiber used in carpet

Characteristics:

- Great resiliency (ability to spring back after compression)
- Accepts dyes better than other synthetics (mostly acid dyes)
- Cleans well
- Resists abrasion
- Dissolves in formic acid

Concerns:

- ✓ Attracted to acid dyes *Kool Aid*

Generations of nylon – first introduced in 1939 by Dupont

First: round fiber magnified soil

Second: modified shape to trilobal

Third: added property to reduce or dissipate static charge

Fourth: added fluorochemical to resist soil and stains

Fifth: added **acid-dye blockers** to repel **acid dyes**



Fifth generation nylon was first introduced in 1986 by Dupont under the trade name **Stainmaster®**. Other fiber producers such as Allied and Monsanto followed quickly with competitive products. Within a few years carpet manufacturers began using their own version of the stain resist technology.

Most of these products have similar warranties stating:

Warranty covers normal indoor residential use for carpets properly installed and maintained in owner-occupied residences. The stain resistance warranty will resist staining caused by most common household food and beverages better than comparable untreated nylon carpet.

Exclusions to the warranty included:

- ✓ Household cleaners including bleach
- ✓ Pesticides
- ✓ Plant foods
- ✓ Acne medicine including benzoyl peroxide
- ✓ Disperse dyes e.g. mustard, herbal tea
- ✓ Pigmented stains e.g. shoe polish
- ✓ Urine
- ✓ Water damage
- ✓ Residue
- ✓ Heavy use of solvents

Guidelines were established to safeguard the stain resist warranty.

- Cleaning agents should not exceed a **pH of 10**.
- Products should not contain **cationic** surfactants.
- **Silicone** products such as protectors should not be used.

Periodic professional cleaning of the overall carpet is recommended. The frequency of overall cleaning may vary depending on the level and type of traffic and the conditions to which your carpet is exposed, and may range from as little as **6 months to 18 months between cleanings**. The preferred method is **hot water extraction** utilizing cleaning products that are **non-cationic** and have a **pH of less than 10**.

Source: Anso® nylon Residential Warranty Information

Polypropylene (olefin) – popular in Berber construction**Characteristics:**

- Must be solution dyed
- Most stain resistant
- Excellent fade resistance
- Least water absorbent
- Floats on water due to specific gravity less than water
- Cleans well

Olefin Berbers are especially tricky and prone to wicking. Due to the looped construction, Berbers can hold large amounts of dry soil. Prevacuum thoroughly, provide additional extraction passes, and use airmovers. In very difficult wicking situations the use of a cotton bonnet may help.



Concerns:

- ✓ Poor resilience *Crushes badly in traffic areas*
- ✓ Low melting point *Wrap those couplers*
- ✓ Attracted to oily soils *Olefin Preconditioner*

Polyester – fastest growing segment

Characteristics:

- Great hand – **very soft**
- Excellent stain and fade resistance
- Cleans well
- Can be recycled from plastic bottles (PET)
- Dyed with disperse dyes, not attracted to acid dyes (**urine, soft drinks**)

Concerns:

- ✓ Resiliency not as good as nylon
- ✓ Attracted to oily soils **especially on fabric from body oils**

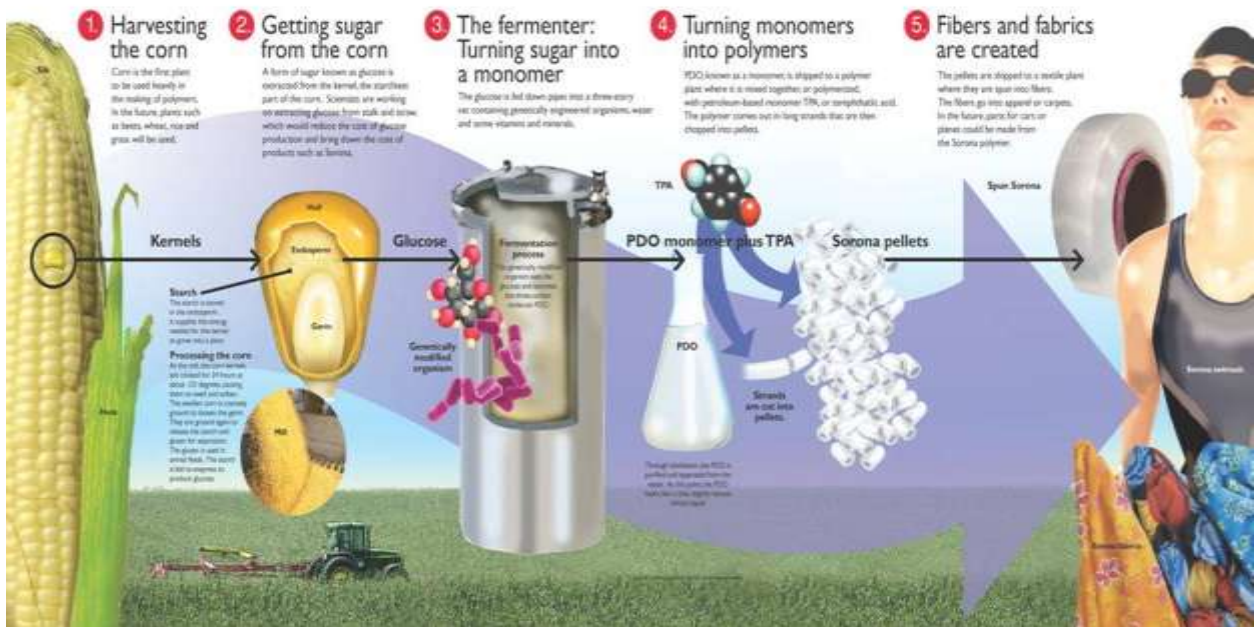
The newest fiber approved by the FTC

PTT Triexta, Dupont Sorona, Mohawk SmartStrand

Smartstrand is the fastest growing segment of the carpet industry. On the next page look at how the fiber is made. Mohawk's marketing makes it appear that the carpet can be easily cleaned with water. While stains are easier to get out of any polyester carpet due to the dyeing system, you will still need presprays and detergents. The pictures on the next page show the products used to remove heavy soiling from the carpet made of Smartstrand fiber.

From corn to polymers and fibers

DuPont® Sorona® is made from naturally occurring starch in the kernels of corn. In the next five years, researchers plan to find ways to use starch from the entire plant.



Matrix Grand Slam boosted with Matrix Citrus Force.



Agitation with a Counter-Rotating Brush system.

Extraction



Following the 5 principles of cleaning along with the right chemistry:
 Matrix Grand Slam
 Matrix Citrus Force sprayed and agitated with a CRB machine, then rinsed with Matrix Confidence handled this carpet.

PET these drink bottles are made into polyester fibers. PET is not as resilient as PTT such as Smartstrand



Acrylic – originally marketed as the synthetic wool because of its similar characteristics.

Acrylic seldom used in carpet but very popular in velvet fabrics.

Concerns:

Shading shows up as different colors on arms of chairs.

FIBER ID by Burn Testing

Fiber	Flame	Odor	Ash/Residue
cotton/jute	orange ember	burning paper	ash
rayon	orange	burning paper	no ash or bead
wool	orange/sputters	burning hair	black ash/crumbles
silk	orange	burning hair	black beads/crushes
nylon	blue base/orange tip	plastic/celery	round, black bead
olefin/polypropylene	blue base/orange tip	asphalt	round, gray to brown bead
polyester	orange sputters black	sweet/fruity	round, shiny, black bead
acrylic	white/orange/sputters	acid, burnt meat	black crust can be crushed

Chemical tests:

Nylon – formic acid, Wool – sodium hypochlorite, olefin – floats on water

Fiber	Advantages	Concerns
Wool <i>protein</i>	Resilient, Warm, soft Luxurious Dyes easily Hides soil Cleans well	Damaged by high alkalinity Dissolves in chlorine Acid dyes stain Agitation can damage Expensive
Silk <i>protein</i>	Most luxurious Soft hand	Color loss Texture distortion Water/solvent rings Perspiration damages fiber Yellows with age Difficult to clean
Cotton <i>cellulosic</i>	Absorbs dyes well Breathes Comfortable Most popular natural fiber Versatile	Stains easily Browns Bleeds Shrinks Slow drying
Linen <i>cellulosic</i>	Absorbent Comfortable Fashionable	Stains easily Becomes brittle with age Browns Shrinks Slow drying
Rayon <i>manmade</i>	Inexpensive Bright colors	Wrinkles, browns, shrinks, slow drying, weakest when wet
Acetate <i>manmade</i>	Sun resistant Shrink resistant	Dissolved by acetone discolors
Nylon <i>synthetic</i>	Dyes easily, strong, resilient, Cleans well, abrasion resistant hides soil well, wears well	Acid dyes stain, urine discolors, pilling
Olefin <i>synthetic</i>	Solution dyed (colorfast), Cleans well, bleachable, quick drying, inexpensive	Attracts oil, yellowing, pilling, Weakened by sunlight, backings dissolved by solvents
Polyester <i>synthetic</i>	Colorfast, cleans well, not attracted to acid dyes,	Attracts oil, yellowing, pilling, nonabsorbent
Acrylic <i>synthetic</i>	Wool substitute, colorfast, sun resistant, cleans well	Heat sensitive, non resilient, pooling in velvets
Triexta <i>synthetic</i>	Built-in Protector, Releases stains easier	May not be as resilient as nylon

Dyeing –

Primary colors – *red, blue, yellow*

Secondary colors are blends of primaries.

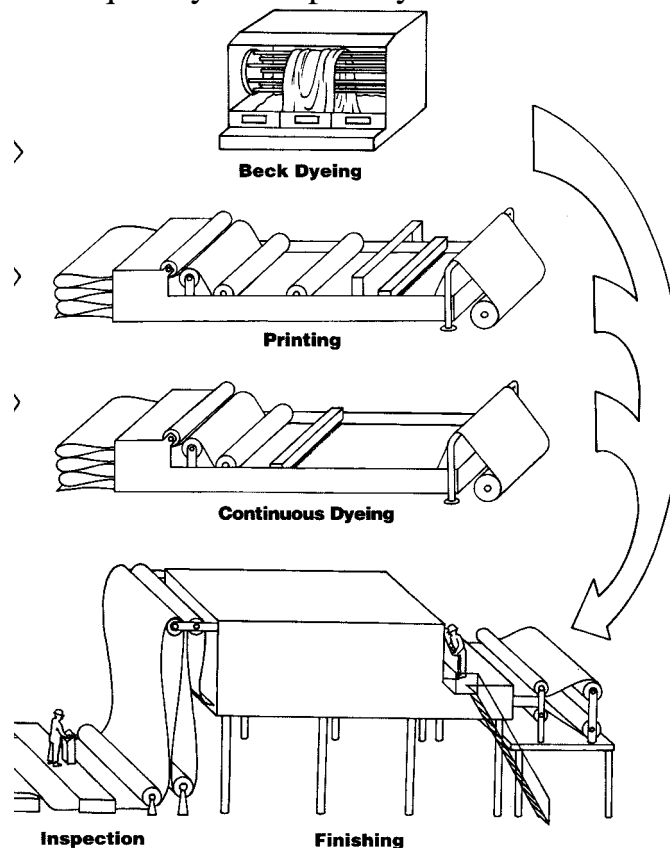
Methods of dyeing

Predyed:

- **Solution** – adding pigment to the polymer before extrusion.
Olefin must be solution dyed while all extruded fibers can be solution dyed. All extruded fibers may be solution dyed.
- **Stock** – dyeing of fibers in staple form.
- **Yarn** – dyed in yarn form before the fabric stage.

Post Dyed:

- **Continuous** – a process in which the fabric or greige goods pass through dyeing and subsequent operations without interruption.
- **Beck or batch** – a process in which separate pieces of fabric are handled sequentially through dyeing and subsequent processes.
- These 2 processes are referred to as piece dyeing and are the **most popular** for residential goods.
- **Print** – application of the dye in a pattern applied through a screen or rollers. Used frequently in hospitality and restaurants.



Color Loss Concerns:

- **Bleeding** – loss of color by the fabric or yarn when contacted by water, as a result of improper dyeing or the use of poor quality dyes. **High alkaline cleaners can increase the chance of bleeding.** High temperatures will accelerate the reaction. When bleeding is a concern leave the carpet in an acid pH state.
- **Crocking** – the rubbing off of a dye from a fabric as a result of insufficient dye penetration or fixation. Crocking can occur under wet or dry conditions but requires agitation. A person sitting on a white chair with new blue jeans may leave a blue tint on the chair.
- **Fume fading** – a shade change of a fabric caused by a chemical reaction between dyes and acid gases from fuel combustion, particularly oxides of nitrogen.
- **Bleaching** – products such as household bleach (sodium hypochlorite), benzoyl peroxide, fertilizers.
- **Pesticides** – loss of color around room perimeters.
- **Ozone fading** – loss of color usually blue.
- **Lighter color** – if the color of the stain is lighter than the carpet, it is a loss of color and will need to be redyed or resectioned.
- **Optical Brighteners** – a colorless compound that, when applied to a fabric, absorbs the ultraviolet in light, but emits radiation in the visible spectrum. OB's void carpet warranties and can cause permanent yellowing of the carpet. OB's are often found in detergents.

Dye terminology:

- **Pigment** – an insoluble material used to dye fabrics especially solution dyes.
- **Dyes** – substances that add color to textiles.
- **Dye sites** – area within the fiber that provides sites for chemical bonding with the dye molecule.
- **Acid dye blocker** – an anionic compound used to block open dye sites in order to eliminate the attraction of acid staining material such as fruit drinks. This is the chemistry behind fifth generation nylon.

Various Color Problems:

- **Metamerism** – variation of color under differing light sources. e.g. sunlight versus fluorescent or incandescent.
- **Pile Reversal** – can be caused by traffic, shading, watermarking, pooling or the installer turned the carpet 180° at the seam.
- **Shading** – an apparent change in color when the pile is bent and the light reflects differently off the bent fibers.
- **Watermarking** – an irreversible, localized change in the orientation of the carpet. The phenomenon has different names in different countries. Referred to as pile reversal, watermarking, pooling and shading.
- **Wear** – a loss of face pile in the traffic areas as opposed to the non trafficked areas.
- **Side match** – dye lots were not installed sequentially.
- **Soil shading** – abrasion of plastic like fibers causing a difference in the way the light reflects.
- **pH indicator dye stains** – imbalance of pH has caused a color change. Adjusting the pH can restore the color. *A good example is the product Erusticator would occasionally cause a blue or gray carpet to turn purple. This was a strong acid. By applying ammonia, a high alkaline, the carpet would return to its normal color.*

Backing – once the yarns have been spun it is time to turn them into a carpet or rug. The yarns in a tufting machine are inserted into a **primary** backing. At this stage the fabric is referred to as **greige** goods or an unfinished (undyed) material. The greige goods are dyed and receive an application of latex before being married to a **secondary** backing. The carpet is dried and sheared if needed and it is ready to be shipped.

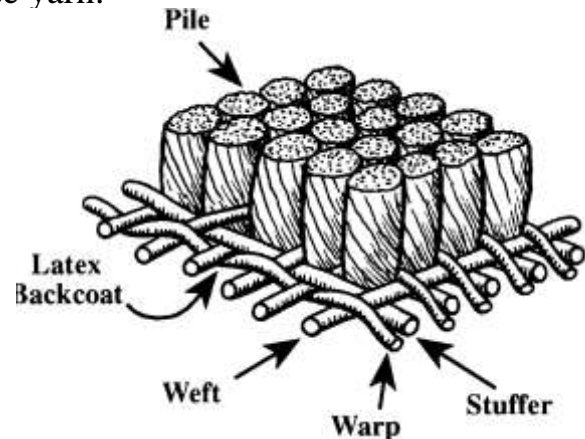
- **Primary** made from polypropylene or jute.
- **Secondary** made from polypropylene or jute.
 - Applying the secondary strengthens the carpet and provides **dimensional stability** (ability of a carpet to maintain its shape).
 - **Synthetic backed carpets cannot shrink.** Only woven carpets with cellulosic yarns or jute backed tufted carpets can shrink.

Carpet Manufacturing

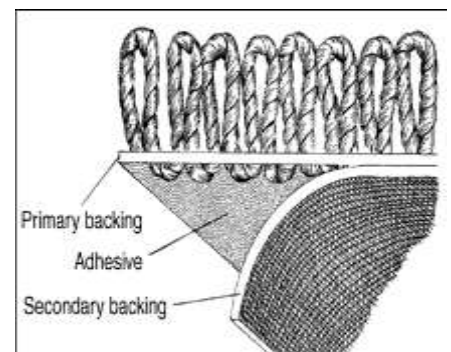
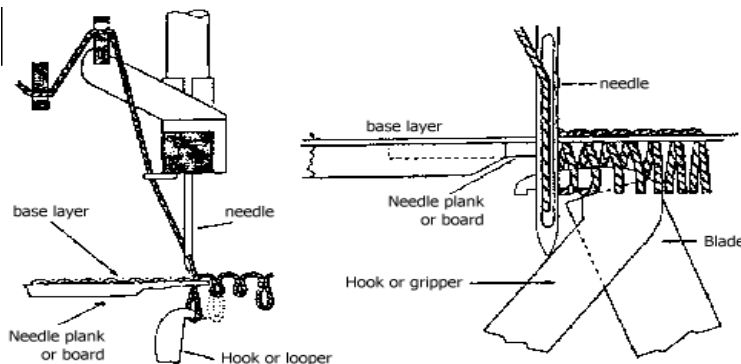
Weaving – method of interlacing two yarns of similar material so they cross each other at right angles to produce woven fabric. Weaving is done on a loom and is much slower than tufting, which makes it more expensive. Woven carpet is distinguished by intricate patterns and is frequently comprised of wool. Two sets of yarn are used the warp or lengthwise and the weft or filling yarn which is the crosswise yarn.

4 components of a woven carpet

- ❖ Pile
- ❖ Warp
- ❖ Weft
- ❖ Backcoat



Tufting – is the most popular form of manufacturing. Tufting machines resemble a multi needle sewing machine that insert the pile yarns through a primary backing and holds it in place as the needle is withdrawn.



Needlepunching – the process of converting webs of loose fibers into a nonwoven fabric.



Fusion bonding – a thermoplastic process in which yarns are implanted in a liquid vinyl compound in a sandwich configuration between two backing materials. A knife splits the sandwich to create two cutpile carpets.

Carpet Styles:

Level loop – loops of the same pile height



Multi level loop- various pile height



Berber – fat loop with colored flecks originally wool but now mostly olefin



Velvet/plush – pile yarns are only slightly twisted and very dense and evenly sheared.



Frieze – a very durable cut pile heat set carpet with a kinked or curled yarn effect.



Saxony – cut pile carpet, highly twisted, evenly sheared medium length pile height. Most **popular** residential style.



Shag – loosely tufted carpet with long yarns with wide spacing. Shag has overcome the bad press of the late 60's when it was made primarily of single polyester yarns. The yarns tended to crush together creating a very ugly carpet. Today's shags are made primarily of a more resilient nylon. Most styles have a thick cable yarn and a single accent yarn. Modern shags are stylish but very **difficult to vacuum and clean.**





Carpet cushion/pad

Proper cushion provides several benefits:

- Extends the life of the carpet by preventing matting and crushing.
- Improves the acoustical properties.
- Provides better thermal insulation.
- Vacuuming is easier.
- Safety is enhanced.
- Carpet feels more luxurious.

Types of cushion:

- **Prime** polyurethane foam is a firmer version of the same cushioning used in upholstered furniture, mattresses, and automobile seats. Two liquid ingredients are combined to form a large mass of foam, which is then sliced into sheets for use as carpet cushion.
- **Bonded polyurethane foam** (sometimes called *rebond*) is quite unique. You cannot mistake it when you see it, because it is formed by combining chopped and shredded pieces of foam, in different sizes and usually different colors, into one solid piece. It frequently has a surface net for ease of installation and improved performance.
- **Molding natural or synthetic rubber creates waffled rubber cushion.** Heat cures the rubber and forms a waffle pattern. This variety produces a soft, resilient cushion whose luxurious feel is particularly useful for residences.
- **Flat sponge** rubber is a firm, dense cushion, which has a flat surface and is normally used in large-scale commercial applications and with loop type (or Berber) carpet.
- **Natural fibers** include felt, animal hair, and jute (the material used to make some kinds of rope and heavy burlap bags). This is one of the oldest types of carpet cushion, dating back to the earliest days of machine-made carpet.

- **Synthetic fibers** include nylon, polyester, polypropylene, and acrylics, which are needle-punched into relatively dense cushions which have a firm feel and, as with other types of cushion, can be made in virtually any weight, to stand up under *light*, *medium*, or *heavy* traffic, which is how they are usually classified.
- **Berber** carpet is becoming increasingly popular, and needs a thin, firm cushion. When using this type of carpet, be sure that the accompanying cushion has been specified by the manufacturer as suitable for Berber carpet.

Installation – Having a good knowledge of proper installation techniques prevents paying unjustified claims.

Commercial Carpet

Standard For Installation Specification Of Commercial Carpet, CRI 104 is a definitive industry minimum commercial installation standard.

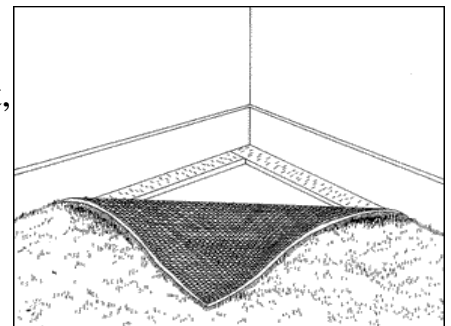
Residential Carpet

Standard For Installation Of Residential Carpet, CRI 105 is a definitive industry minimum residential installation standard.

These standards are available free of charge and may be downloaded at www.carpet-rug.org

Installation methods

- **Stretch in** – Provides enhanced underfoot comfort, acoustical properties (i.e., higher noise reduction coefficients and higher impact noise ratings) when installed with separate cushion.



- **Glue down** – carpet is glued directly to the floor.
- **Double Glue-down Installation** - Combines the stability of direct glue-down carpet with the cushioning benefits of a separate cushion, stretch-in installation .

Installation Tools

Power Stretcher – required for all stretch in over pad.



Knee Kicker – a positioning tool.



Seam sealer – required on all cut seams



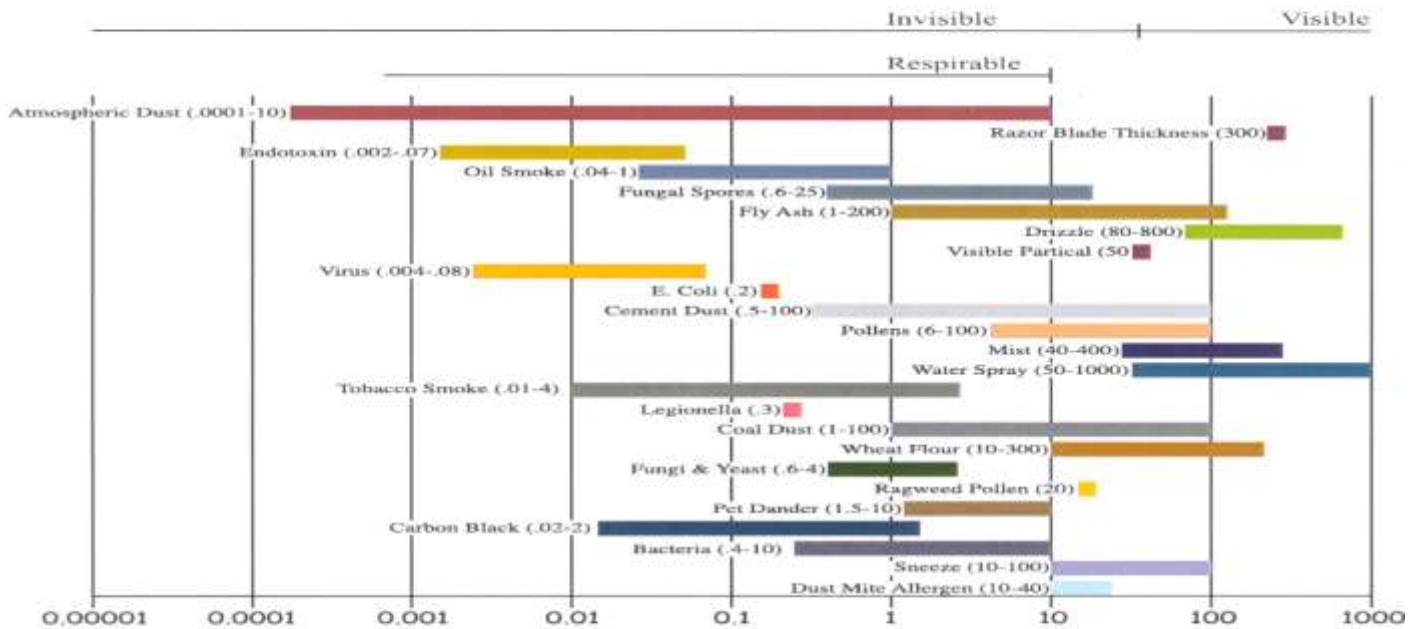
Installation concerns

- **Carpet rippling** – caused by failure to power stretch the carpet. Alert the consumer that the carpet should settle to precleaning levels once the humidity has stabilized.
- **Commercial Carpet bubbles** – improper use of solvents, improper adhesive or inadequate amount of adhesive can cause bubbles.
- **Seam separation** – may be lack of seam sealer.
- **Delamination** – separation of primary backing and face fiber from secondary backing.

Causes:

- ✓ Improper specification
- ✓ Improper latex formulation
- ✓ Improper use of solvents
- ✓ Wrong cushion
- ✓ Inadequate latex encapsulation of the yarn (olefin berber)

Micron Size Range of Pollutants



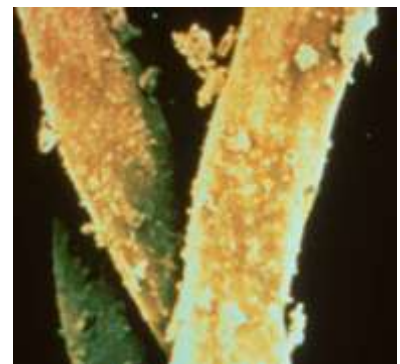
Data compiled by Professional Testing Laboratory and Carpet and Rug Institute



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Email: info@ptl.net

1 micron is a unit of measurement = 1/1,000,000 of a meter or a micrometer

Soil is any unwanted matter on the surface of any object that one desires to be clean. Cleanliness is an unnatural condition, because all surfaces are constantly being soiled. In order to clean a surface, it is therefore necessary to work against nature and special care must be taken to ensure that all soil is removed and not redeposited on the surface.



Most soil is **acidic in nature** consisting of foods, soft drinks, bodily fluids, acid rain and other materials. The majority of soil is brought in from the outside by foot traffic. Materials such as sand and grit quickly work their way to the bottom of the pile where they can become trapped by compacted

yarns. **The majority of this tracked in soil accumulates at the entry points in the home.** Fine particles (0.1 microns) have a significant effect on visible soiling. These particles, although by weight are minimal, actually are responsible for the soiled look of the carpet. Large particles fall to the bottom while fine particles may be trapped in the abrasions and imperfections of the fibers.

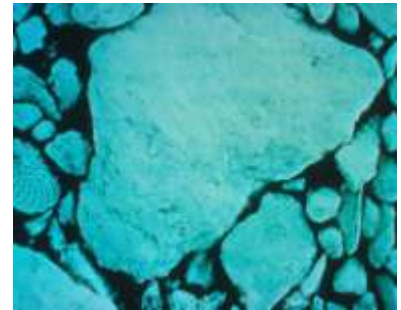
- **Real soil** – actual amount of soil in the carpet that can be weighed and measured.
- **Visual soil** – soil that changes the color and luster of the top third of the carpet.
- **Apparent soil** –soil that cannot be removed due to shading and abrasion. This is referred to as graying of the traffic lanes. This should be explained to the customer beforehand.

Shading, pooling, watermarking, pile distortion as well as wear can make traffic lanes look darker even after proper cleaning.

Classes of soils

Insoluble –

sand, clay, quartz,	45%
animal fibers, skin	12%
cellulose, paper, grass	12%
gypsum, apatite	5%
limestone, dolomite	<u>5%</u>
	79%



Water Soluble -

resins, gums, starches	10%
------------------------	-----

Dry solvent soluble -

fats, oils, rubber, tars	6%
moisture	3%
unknown	<u>2%</u>
	100%

* study performed by Hoover Vacuum Company 1953

Carpet filters soils, pollutants, gases, and animal dander. Like any filter it needs to be cleaned.

Nearly 80% of the soil is insoluble which means that it does not dissolve in water or solvents. The best and most thorough way to remove insoluble soil is through vacuuming.

Principles of Cleaning

The objective of carpet cleaning is soil removal. Cleaning can be accomplished by several methods, but regardless of the method chosen, five principles must be followed to achieve the best results.

Dry soil removal – use of a CRI Green Label vacuum with a high efficiency filter is recommended.



HEPA (High Efficiency Particulate Air) is a filtering efficiency specification for filters developed by the Atomic Energy Commission during World War II to effectively remove radioactive dust from plant exhausts without redistribution. A HEPA filter must retain all particles as small as 0.3 μm in size with an efficiency rating of 99.97%. The phrases "as small as" or "at" mean that if all particles were that small, it would still have that efficiency. This should not be confused with the phrase "down to" which may mean a mixture of particle sizes for the stated efficiency. Particles smaller than 7 μm are not contained in low-efficiency bags.

Prior to vacuuming if the carpet is matted or tangled in entries, pivot or high-traffic areas a **brush or groomer** should be used to separate the yarns. This will improve the airflow and allow the vacuum to remove more soil.

Vacuuming should be performed in a push and pull motion with a minimum of **6 passes** in heavy traffic areas. The push pass is the positioning pass and the pull is the soil removal pass. Slow down on the pull pass.

Hand vacuum the **edges** of the room and if the **entry** is heavily soiled hand vacuuming may be required also.

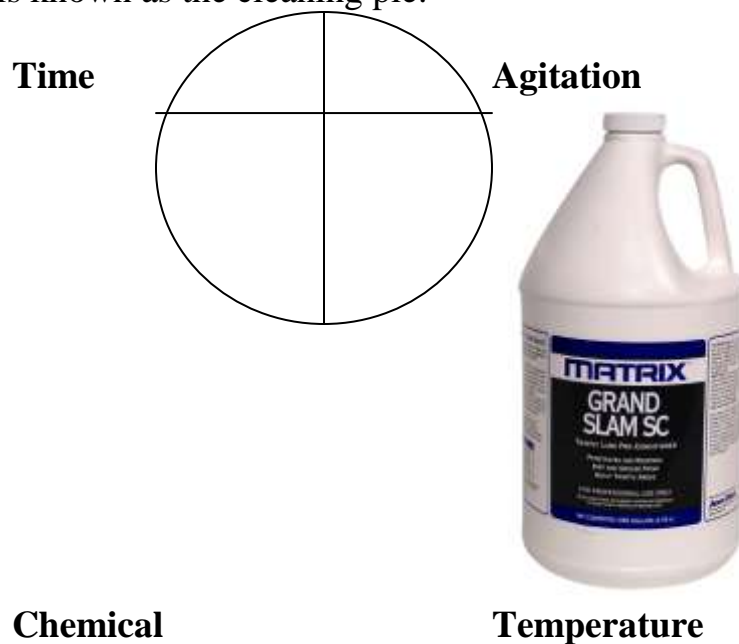
Removing soil when it is dry is a lot easier than removing mud.

Empty the bag when it is **1/2 -2/3 full**.

A truck mounted cleaning unit is not designed to remove dry soil regardless of the power of the vacuum system. Most manufacturers do not recommend the use of their systems for dry soil removal due to possible damage to the blower. The most effective tool will always be the vacuum cleaner.

Soil suspension

Soils that were not removed during the dry soil removal step are suspended from the fiber during this step. This is accomplished through four fundamentals known as the cleaning pie.



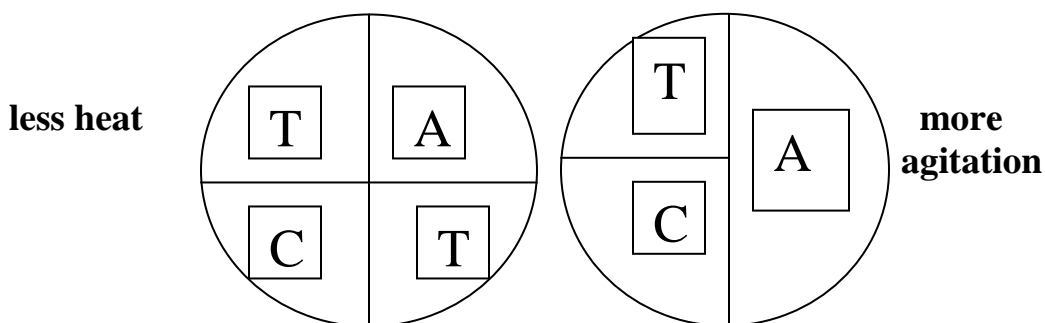
Time – soil that has accumulated over months or years cannot be suspended in a manner of seconds. The preconditioner must dwell for a period of time to be most effective. The longer the better, but it should not be allowed to dry. On non-colorfast carpet the dwell time should be limited.

Agitation – provides uniform distribution of the preconditioner or detergent. This may be accomplished manually with hand brushing or with mechanical agitation, as long as adequate detergent lubrication is provided. The agitation helps to lift matted fibers.

Chemical – Detergents, builders and or selected solvents must be used to suspend, emulsify or saponify the various soils. Detergents used on stain-resistant carpet must be anionic or nonionic with a pH not to exceed 10. Detergents used on wool must be within a pH range from 4.5 – 8.5.

Temperature – Increasing temperature reduces the surface tension of water, while it accelerates most chemical reactions, thereby causing cleaning agents to function more efficiently. Higher heat may reduce the quantity of cleaning agent required, which may result in fewer residues.

When one part of the pie is **decreased** one or more of the others must be **increased**



In methods such as absorbent compound heat is missing from the fundamentals. In this case agitation has been increased by the brushing action.

Soil Extraction

Once soils have been suspended they must be physically removed from the carpet. Various cleaning methods accomplish extraction include absorption, wet vacuuming, rinsing or vacuuming of dry detergent residues and suspended soils.

Increased temperature during extraction improves cleaning agent efficiency. Temperature during extraction should be limited to 140 F at the carpet on cut pile wool, on noncolorfast carpet, and on velvet plush pile designs that might be subject to distortion when extreme heat 160 F plus is combined with high-pressure injection (over 300 psi).

Cleaning processes seek, as a minimum, to sanitize (clean to a generally healthful state) those environments, insofar as possible.

Substances extracted from carpets by any method must be disposed of in accordance with all local, state and federal regulations.



Grooming

Grooming is recommended for appearance (removal of wand marks), for uniform distribution of carpet protectors and for proper drying.





Drying

The level of soiling, method of cleaning, humidity and airflow affect drying. The goal of every technician should be to have the carpet dry in 6-8 hours, but in a worst-case scenario in 24 hours. The technician is responsible for any overwetting problems.

Carpets that exceed proper drying time could result in slip and fall hazards, odors, and rapid resoiling.

Technicians should post warning signs where slip-fall potential exists.

Airflow is necessary to achieve drying. The technician should provide airmovers combined with ventilation throughout the cleaning and drying process.

Is your equipment working as efficiently as you are?

Check out these items regularly:

- ✓ Vacuum hoses and hose cuffs
- ✓ T-jets
- ✓ Vacuum blower or fan vacuums
- ✓ Belts on blower



- ✓ Dump valve
- ✓ Lips of the wand

Finally, are you making a sufficient amount of drying passes?

The technician is responsible for the equipment as well as the technique.

That means if there is an overwetting problem the technician is the culprit.

The customer normally has one big question when they call for cleaning.

How long will it take to dry?

Methods of Cleaning

As previously discussed, each method needs to adhere to the five principles of cleaning to achieve maximum cleaning. All methods of cleaning use detergents. The difference is in the carrier used (water, foam, compound) to deliver the detergent. All methods can improve the effectiveness and contribute to the effective removal of biocontaminants by increasing the temperature of the chemical.

The first step in all methods is thorough dry soil removal using a vacuum with a high efficiency filtration system.

Absorbent Compound



This method may incorporate the use of an organic or synthetic carrier that contains detergents, solvents and a bit of moisture. The compound may or may not be preceded by a preconditioner. The compound can be spread by hand or a specially designed machine. Brushing is used to spread and agitate the compound that absorbs the suspended soil. Following drying the suspended soil and compound is removed by dry vacuuming.



Dry Foam

Dense foam is produced by a dry foam machine through mechanical aeration of a liquid detergent. A preconditioner may or may not be used prior to application of the foam detergent. The foam is distributed and agitated via mechanical brush action. Suspended soil and the foam are extracted by the same machine or with a wet vacuum.





Absorbent Pad (Bonnet /Oscillating Pad)



A preconditioner may or may not be used prior to cleaning. Detergent in either a dry-solvent based or a carbonated or non-carbonated water-based carrier is sprayed onto the pad and the carpet. The pads may be round or square towels made of cotton, rayon, synthetics or a combination of fibers. In place of spraying the pad they may be dipped into a bucket of cleaning solution. During the agitation (spin buffing/oscillating) phase of soil suspension, the bonnet (pad) attracts or absorbs suspended soils. Technicians must monitor the rate of soil attraction to the pad and turn it over or replace it as soil accumulates. When both sides of the pad are soil saturated, it must be exchanged before continuing in order to assure maximum soil removal.



Shampoo

A preconditioner may or may not be used prior to shampooing. A high-foaming detergent is applied to the carpet nap through a shower or channel-feed, nylon bristled brush rotating at a speed recommended by the equipment manufacturer that is safe for the carpet being cleaned. The agitation of the brush creates the foam that suspends the soil. Depending on the detergent used, either a wet vacuum extracts the suspended soils and detergents or upon drying the suspended soils and detergents are dry vacuumed. Brushes not properly lubricated with shampoo can cause textural damage to the carpet.



Mist & Scrub Method (Encapsulation)

The cleaning agent is brushed into the carpet using a cylindrical or rotary brush machine. The encapsulation chemistry surrounds each soil particle and crystallizes it so it can't attract other soil. The encapsulated particles release from the fiber and removed through dry vacuuming.



The Big 3 for Hot Water Extraction



Hot Water Extraction (HWE)

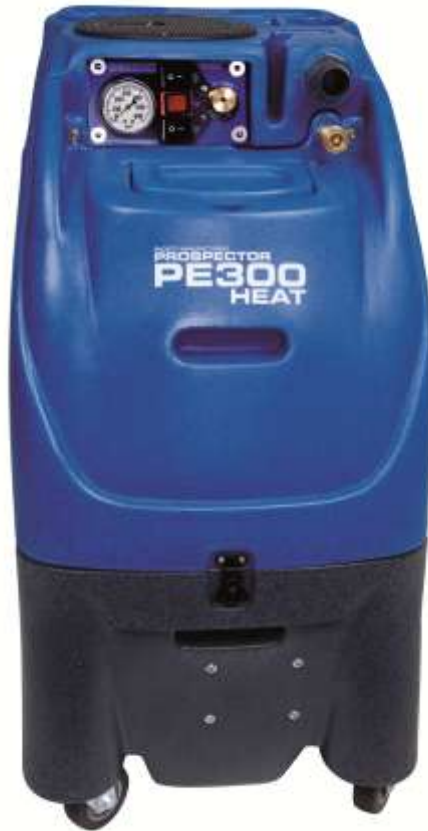
A preconditioner is normally applied through a pump sprayer, in-line sprayer or by using a rotary shampoo machine. The suspended soil along with the preconditioner is flushed from the carpet with a HWE machine. Heavily soiled carpets may need several flushing passes and followed up with several overlapping extraction only passes.

Complete drying should be accomplished in 6-8 hours, but not to exceed 24 hours. Additional extraction passes; air movers and good ventilation will expedite drying. Over wetting or prolonged drying are normally due to **operator error**.

All extracted solutions must be disposed of according to local rules and regulations. Wastewater should be disposed of into a sewer line leading to a wastewater treatment station.

All methods should be followed by pile setting or grooming as necessary. Nap setting must be accomplished for uniform distribution of all post cleaning treatments.

Understanding the components of an extractor is important to the end result.
HWE can be broken into two main categories:



- Portables
 - (box & wand)
 - walk behind
- truck mounts
 - van powered or direct drive
 - slide in units (separate engine)
 - electric

The major difference between the portables and truckmounts is productivity. While a few portables have direct water and waste hookups most truckmounts can clean higher volumes of carpet due to greater heat, pressure and vacuum.



More heat, more vacuum, more pressure = more productivity

Vacuum is measured in two ways:

- Lift measured by inches of mercury (Hg) or water (H₂O) lift.
- Airflow CFM – cubic feet per minute.

HWE cleaning strokes:

Single pass – apply solution on forward stroke and vacuum on backstroke.

Double pass – apply solution on forward and backstroke shutting off solution momentarily at end of stroke. Be sure to give additional vacuum.

Chop stroke – apply solution in short continuous strokes. Be sure to provide adequate vacuum passes when through. Use in heavily soiled areas. Use caution on velvet styles and wool carpet.

Tools



RX20



Drimaster Upholstery Tool

Prochem Upholstery Tool



Safety Issues:

1. Truck mounts that are powered by the truck engine should always be parked so that the exhaust faces away from the home. Fumes are easily drawn into the structure.
2. Truck mounts that use propane heaters should have the propane tanks mounted on the outside of the van. Be sure the valves have been shut off before driving.
3. Check and replace any solution hoses that are worn to prevent a line rupture.
4. Replace any electrical plugs that are missing the ground plug.
5. Make sure all equipment including wands has been secured in the van before driving. Be sure the back doors are closed before driving.
6. Have a Material Safety Data Sheet (MSDS) for every product on the truck including any household type chemicals. These sheets need to be in a folder accessible by the driver with his seatbelt fastened.
7. Every spray bottle and container must be labeled.
8. Carry and use goggles, gloves and respirators as necessary. When in doubt wear them.
9. Use the proper gauge electrical cords with grounds.
10. Drive safely and cautiously. Remember your company name is on the side of your truck.
11. When mixing chemicals wear PPE and only mix them in your facility or in your van. Never mix chemicals in your customers home.
12. Purchase chemicals from a reputable source and never mix chemicals other than by label directions.
13. Never leave chemicals samples in unlabeled bottles for your clients.

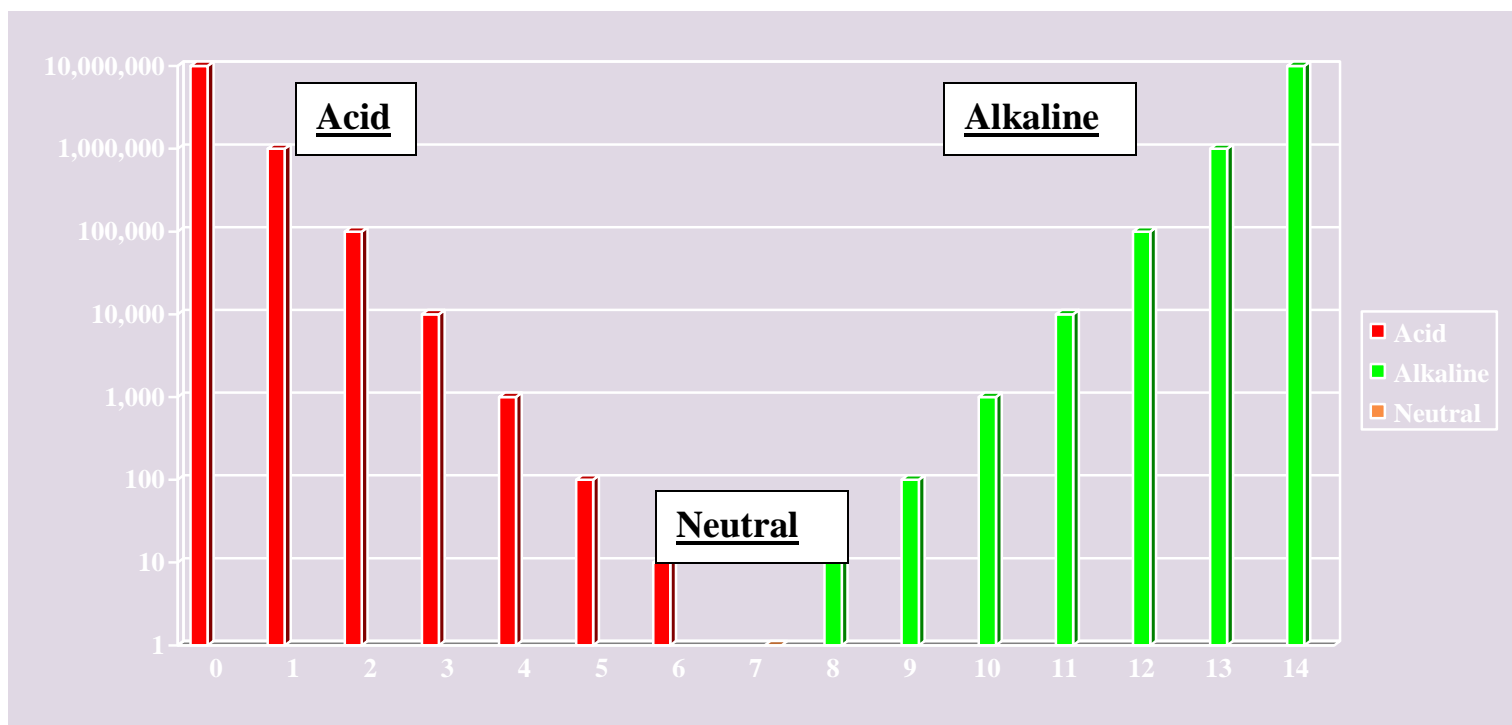
Chemistry

Many of us recoil in horror when we hear the word chemistry. It reminds us of that horrible class we took in high school. We were expected to memorize terms such as electrons, protons, valence and that terrible periodic table.

The difference between your high school chemistry class and learning cleaning chemistry is tremendous. Back then chemistry was a subject you felt you would never use. Today understanding a bit of detergent chemistry can not only make our jobs easier but also increase our profitability. But just like in school we need to learn some of the terms to really understand cleaning chemistry.

pH - the **relative acidity or alkalinity** of a water-based solution. The pH chart ranges from 0-14. Acids are below 7, neutral is 7, and everything above 7 is alkaline. Each number as it moves from 7 in either direction increases by 10 times the previous number.

In addition to pH the strength of a cleaning solution is determined by the **concentration**. This measures the amount of material in the solution. For example 7% acetic acid means of the total weight 7% is acetic acid.



**Solubility means what dissolves a substance. Water dissolves food
Solvents dissolve gum, grease and oils.**



Today we use synthetic detergents such as **Matrix Finish First**. Petrochemicals have replaced animal fats in detergents. These products do not break down in hard water like the soaps and do not leave a soil-attracting residue.

A properly formulated detergent has several ingredients:

Surfactants - to help penetrate, lower the surface tension and wet out the fabric.

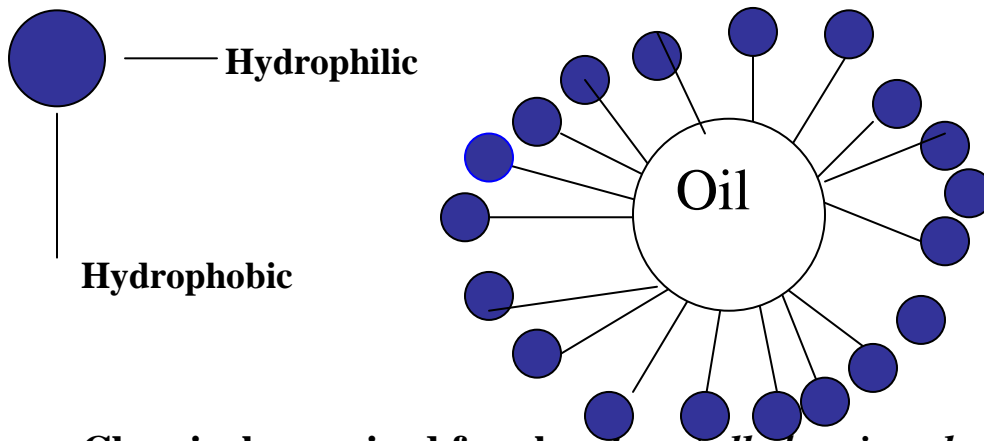
Builders - to provide alkalinity, soften the water and prevent redeposition of the soil once it has been suspended. Soft water allows the use of less detergent.

Solvents – designed to emulsify oils.

Deodorizer – because if it smells clean it is clean.

Soap and detergent molecules do have one thing in common. One end of the molecule hates water (**hydrophobic**) and one end likes water (**hydrophilic**).

Think of a detergent molecule as resembling a **tootsie roll pop**. The head (the tasty part) is the water loving part and the tail or stick is the water hating part. If it is water hating that means it will go to anything that isn't water such as oils in the soil. The stick/tail attaches to the oily soil while the head is attracted to the water of the cleaning solution. Eventually the head pulls into the water and the tail pulls the dirt off the fiber into solution. This is normally happening during the preconditioning or soil suspension step. Agitation during this step speeds up the process and a hot solution will help to dissolve grease and oil on the carpet.



Chemicals required for cleaning: *(all cleaning should be preceded by vacuuming to remove insoluble soil)*

1. Preconditioners – the workhorse of cleaning. Because most soil is acid most preconditioners and detergents are alkaline. Soil suspension is accomplished primarily with this step. These products can fall into several categories

- General - can be safely used on all synthetic fibers as long as the product has a pH under 10 and is not cationic.



Hot continuous prespray



Heavy duty – used on restaurants and non stain resistant carpets. Normally the pH is between 10-12 and may include enzymes. Voids the warranty on stain resistant carpet. Add a booster (**Citrus Force**) for the really tough ones.

Neutral to acidic – mild products used on wool, cotton and any non-colorfast carpets or rugs.



2. Rinse detergents – added into cleaning solution.

- Alkaline – used on any synthetic including stain resistant carpet as long as the product has a pH under 10 and is not cationic.



- Used when carpet is more than moderately soiled.
- Can be used on wool if pH is 8.5 or below.
- Can accelerate browning on cellulosic materials.
- Most preconditioners are alkaline due to acidic soil.



When using a portable machine it is much easier and less wasteful to use a liquid detergent as opposed to trying to dissolve a powder.

Confidence – Liquid alkaline detergent



- *Acid Rinse*– used in place of an alkaline detergent when carpet is light to moderately soiled.
 - Very effective in removing alkaline residue from previous cleanings. pH 2.5
 - Stabilizes dyes while preventing browning
 - Breaks down alkaline salts from old urine.
 - Usually dries faster than alkaline detergents.

All Fiber Rinse – Neutralizing acid rinse

In most residential carpets a quality preconditioner and rinse detergent will remove 90-95 of soil and spots.

Remember that most of the cleaning is being accomplished with two products your preconditioner and detergent. This is not the time to look for the least expensive chemicals. Labor is the most expensive component of your business. If you use cheaper chemicals your labor expense will increase. Effective chemicals make the job easier and will result in happier customers. That means repeat business.

The easiest method is the 1-2-3 steps of cleaning.



Fabric cleaning chemistry

One of the main differences between carpet and fabric is the amount of natural fiber being used in fabric. This leads to concerns of shrinkage, bleeding and browning. The preconditioner used for fabric is usually a **lower pH** and has fewer wetting agents due to the thickness of the fabric. Fabric normally has more body oils and a fabric preconditioner normally has more solvency to break down the oils.



Matrix Outset

For synthetic fabrics an alkaline rinse detergent may be used.



Matrix Impression

For blends such as cotton and polyester it is best to use **Matrix All Fiber** rinse following preconditioning..

This may also be used as a spray on rinse after using Impression to neutralize and brighten the fabric.

When you need to dry clean you have 2 choices.



**Solvent
based dry
cleaning**

Matrix OMS Kleen Rite Dry Cleaning Concentrate
**Solvents may have an odor that some may find objectionable
and you must have a dry cleaning unit that can handle
solvents. An easier method is using dry foam with a natural
sponge or horsehair brush.**



Acidic dry foam is very safe without the odor and will brighten the fabric. This will not remove heavy soiling.



Matrix Radiant Fine Fabric Shampoo



Use the foam only from the bucket, extract using Matrix All Fiber Rinse or simply towel off with a clean white towel.

Fabric cleaning is very safe and very profitable if you inspect and test carefully, proceed with the correct chemistry and dry rapidly.

Spotting for the professional

Once the carpet has been preconditioned and rinsed a few spots may remain. In many cases while 95% of the carpet may look great it may be these few spots that really provoked the customer to call. If you cannot remove these spots the customer may feel that you failed.

The difference between a cleaner and a professional is getting those spots out of the carpet. A word of caution, a few stains may not be removed. Learn how to resection a carpet and you can guarantee 100% spot removal.

Definitions:

- Spot – substance added
 - Gum, tar, food, ink
- Stain – color added
 - Wine, red pop, mustard
- Discolorations – color removed
 - Bleach, medicine,
- Damage – repair required
 - Toilet bowl cleaner, burns

Identification: before you can remove a spot you need to identify the category that it falls in. Knowing the fiber and backing type you are working on will help determine how aggressive you can get. In other words there is a big difference in taking red dyes out of wool versus olefin. Solvents are much riskier on glue down installations than on stretch in installations.

- Ask the customer
- Location – bathroom versus kitchen
- Use your senses
 - Sight
 - Smell
 - Touch
 - Taste?

Professional Spotting Kit



Matrix PROFESSIONAL SPOTTING KIT

Using a professional spotting kit will instill confidence in the consumer that they chose the right company. The spotting kit should have a solid bottom and a lid that can close. Ideally it will have preformed slots so that a missing bottle is very evident before you leave the job site.

Chemicals required:

Solvents – normally water free and used to break up oily or non water-soluble spots (nonpolar). When using solvents wear PPE and provide plenty of **ventilation**. Solvents normally have a low **flash point** (temperature at which a vapor will ignite). Solvents should be used carefully to prevent delamination of the carpet backing.

- **VDS** - Volatile Dry Solvent (evaporates) solvents are only used for spotting, not total cleaning.
- **NVDS/POG** - Nonvolatile Dry Solvent –also referred to as Paint Oil Grease remover – leaves a residue that needs to be rinsed. Provides more dwell time than a volatile solvent.

Citrusolve



Breakdown POG



Orange Power Gel

- **Citrus gels** - same as POG except in a gel form which helps to prevent delamination of carpet or adhesive.

Water-based – these spotters are used on water-soluble (polar) spots. Many of these spots are easily removed with a quality preconditioner and extraction.

- **NDS Neutral Detergent Spotter pH 6-8**



Spot Out

- **ADS Alkaline Detergent Spotter pH 9-10**



Release

- AS Acid/tannin spotter pH 4-6



Target Tannin Stain Remover

- Enzyme/digester pH 7 – designed to break down protein and carbohydrate materials that have become insoluble. Must be used with hot water 100-150° and at least 20-30 minute dwell time. Some spots may require even longer dwell time. The spot should be rinsed prior to application of the enzyme to provide a neutral environment. Rinse as the final step.
- Rust remover pH 1-4 – neutralize and rinse after applying rust remover.



Rust Eradicator (MX-RE-EA)



Dye removers can also
remove carpet dye.

BE CAREFUL

Red B Gone



Advanced Stain Remover

Oxidizers/Reducers – color removal by adding oxygen.



Matrix Oxidizer



Proxy Spray & Walk Away

Oxidizers are bleaching agents. Before you think that you are going to damage all your carpet, you need to understand the different types of bleaches. The sun is a very large oxidizing agent. Ozone that is used in odor remediation is an oxidizer. A few are great tools and others will get us in trouble.

- Sodium hypochlorite/ household bleach will dissolve wool and silk and destroy the color in nylon. While it can be safely used on 100% olefin it should only be considered in a salvage situation.
- Hydrogen peroxide 3% is a very safe yet slow acting color remover. Effective on minor blood spots. It is always found in a dark bottle and should be kept in a cool dark place. Hydrogen peroxide is self-neutralizing. Higher % hydrogen peroxide used for hair bleaching may also bleach the carpet.
- Oxidizers can be accelerated by heat and light.
- A color made invisible by oxidizers is permanent.

Reducers/strippers perform a similar function (**color removal**) to oxidizers by **removing** oxygen from the stain. Common ingredient in most reducers is Sodium Bisulfite. Found in coffee removal and Haitian Cotton cleaners.



Reducing Agent

Reducers are not as permanent as oxidizers because the stain may absorb oxygen-containing moisture.

- Reducers are commonly found in coffee stain and browning formulas as well as in Haitian cotton cleaners.
- Sodium Bisulfite/metabisulfite are mild reducers.
- Sodium Hydrosulfite is much stronger with a terrible sulfur smell. Suppliers have new formulated products that are effective on mustard and furniture stains.

Enzymes – are protein molecules that accelerate chemical reactions by helping to break up other target molecules such as blood, eggs, milk and old urine into smaller soluble pieces. Most cleaning or spotting enzymes are proteolytic which means they break down protein.

Enzymes are not living organisms but biological catalysts and are highly specific. They work similar to a key and lock.

Microorganism deodorizers are made up of specific strains of bacteria or fungi, which are considered living, as compared to enzymes which are nonliving.

Enzymes are easily deactivated by extremes of pH, temperature, cationic surfactants and require water at all times.



Zoop



Amped

Tools required:

- pH paper



(CA-PH-EA)

- bone spatula



(CA-BS-EA)

- tamping brush



(CA-NSB-EA)

- napping shears



(IR-DNS-EA)

- white towels (**clean**)



(CA-HT-CS)

- eye droppers or Q-tips

- bottles with drip spouts  (CA-8SB-EA)

- trigger spray bottles  (PA-SMS-EA)

- inspection & black light



(CA-IL-EA)



(CA-BL-EA)

- PPE (gloves, goggles, respirator)



(MI-SGDV-EA)



(CA-6072-EA)

- Small dropcloth

Steps of removal – remember that you did not cause the spot or stain. Explain to the customer the options and the risks of each method. You do not determine which method to use. The customer selects after you have provided the information. If necessary have the customer sign a release. If the stain cannot be removed it is because of the characteristics of the staining material in relation to the fabric. It is not the weakness of the technician.

1. **Always pretest your chemicals.**
2. **Wear appropriate PPE.**
3. **Follow the label directions.**

- Remove the excess – blot, scrape, absorb.
- Check the solubility of the spot. When in doubt of the stains components use a volatile (**evaporates quickly**) solvent on a towel and blot. If it is solvent soluble it will transfer. If not it evaporates quickly and you can switch to a water-based spotter.
- If the spot responds to your choice of spotter be sure to work on the spot from the outside in to avoid spreading the spot.
- Patience! If you use the correct spotter most spots will dissolve given adequate dwell time.
- Once the spot has been suspended rinse the residue and contaminants.
- If the carpet has a pile, groom the pile.
- If you believe the spot may wick place absorbent paper toweling on the spot and weight it down. Inform the customer to remove the toweling in 12 –24 hours.

Concerns:

- Using more of a spotter can leave more residue and cause resoiling. **More is not better.** Additional dwell time, heat or agitation will work more efficiently.
- Never **rub** a spot. Use the tamping brush or a bone spatula. Wrapping a towel around the brush helps keep your brush clean and absorbs the spot.
- If the spot is **lighter than the carpet** you probably have color loss and the carpet needs to be redyed or resectioned.
- Urine spots and odor are difficult because the customer believes there is only 1 spot while there may be multiple locations. Once the residue has been removed there may be a color loss.

Specialty spotting – certain spots may require specialty spotters and techniques. Use caution and explain everything including risks to the customer prior to attempting spotting.

Rust

When using any acidic rust remover such as hydrofluoric, oxalic or a specially formulated acid neutralize with an alkaline material and thoroughly rinse the spot. Watch where you set the bottle as it may damage glass.

Red dye

Specialized spotters have been developed for red and other synthetic dye removal. Most use the heat transfer method. Apply the dye remover to

the spot then place a damp towel and place the iron or wallpaper steamer over the spot. Check the towel after 15-30 seconds to see if there is a transfer. As long as the dye of the carpet is not transferring to the towel it is safe to continue.

Red B Gone



Mustard

Removing organic dyes such as mustard and furniture stain requires a reducing agent. Mustard and furniture stains are very difficult to remove. For severe stains the chemical may need to be covered in plastic and allowed to dwell for 8-24 hours.



Advanced Stain Remover

Persistent protein (milk, gravy, egg)



Remove excess material and rinse. Work enzyme digester into spot. Cover with a hot wet towel. Place bucket of hot water on spot and wait 20-30 minutes. Remove observe and rinse. **Important** do not use hot water on protein spots.

Blood



Small amounts may be removed by a cool spotter or an enzyme/digester. For larger amounts follow blood-borne pathogen guidelines.

Blood Eraser



Benzoyl Peroxide

A bleaching agent (peroxide) present in acne medicine and other cosmetics/medications. Activated by heat and moisture. Causes loss of color and must be redyed or resectioned. This affects carpet or fabric.

Spotting Chart

Volatile Dry Solvent VDS Ink Fresh paint Grease Carbon Shoe polish Tar Oil Rinse for NVDS <u><i>VDS is for minor solvent soluble spots if spot is heavy go to NVDS.</i></u>	Non Volatile NVDS POG Nail polish Lipstick Glue Dried paint <u><i>NVDS should be rinsed with VDS. Be careful of delamination.</i></u>	Citrus Gel Gum Lipstick Glue Can be used in place of NVDS when delamination is possible. <u><i>Gels must be rinsed. Gelling agent can cause rapid resoiling.</i></u>
Neutral Detergent NDS Minor water soluble spots <u><i>Preconditioner will remove same spots during cleaning.</i></u>	Alkaline Detergent ADS Food Soft drinks Rust remover neutralizer <u><i>Preconditioner will remove same spots during cleaning.</i></u>	Acid/Tannin Spotter AS Tea Coffee Urine Feces Alkaline Neutralizer
Enzyme/Protein Spotter Old food Blood Old milk Old urine Gravy Vomit <u><i>Apply cool and allow plenty of dwell time.</i></u>	Rust Remover Rust <u><i>Be sure to neutralize and rinse. Can cause burns and etch glass.</i></u>	Oxidizer/Reducer Dye stains Wine Furniture Stain Mustard <u><i>These products can also remove carpet color. Use caution.</i></u>

Remember to pretest your spotters and follow directions.
Experiment at home not in your customer's home.
Use only enough spotter to suspend the spot.

Principles of deodorization

1. Eliminate the source
2. Clean surfaces
3. Recreate the conditions of penetrations
4. Seal

Additional chemicals

Deodorizers – odors are triggers. Smells may be experienced as negative, positive or neutral. If we react negatively to an odor we are provoked to a behavior that reduces or removes the odor. A favorable scent leads us to a positive or pleasant reaction.

In our industry we have a variety of deodorizers.

- **Scents** are products that only add a perfume to the air and have no other quality other than masking. This will not destroy a bad odor. Once the scent has evaporated the malodor will return.



Matrix Fresh Family



- **Odor neutralizers** contain essential oils that attract malodorous molecules and neutralize them.

Fresh Wave

Contains water, lime, aniseed, cloves, and cedarwood . Ideal for organic and inorganic odors. No chemicals, no VOCs.



Bottom Line

- **Microorganisms** are natural fungi or bacteria used to destroy urine-based odors. **Biocides/sanitizers/disinfectants** kill specific bacteria or sanitizes to a level of public acceptance



Urine Pre-Conditioner

- Dissolves and liquefies urines residue while neutralizing alkalinity.



Matrix Bad Dog is a liquid oxidizer and can be used as a general organic stain remover for coffee, urine, and wine.

Matrix Bad Dog



Matrix Miracle is a powdered oxidizer that is designed to be dissolved in very hot water and then poured through the carpet and pad reaching the floor. The product is allowed to remain for a minimum of 15 minutes before extracting with a subservice tool such as the Dry Pro. If the odor is extreme saturate a second time at 15 minutes and allow a total of 30 minutes before extracting. Miracle can also be used on tile and grout.

Matrix Miracle

Oxidizers such as ozone, chlorine bleach, or hydrogen peroxide burn up odors.

Tools for detecting urine deposits



After locating the urine deposit with the moisture detector (alkaline salts hold moisture) or the UV light (urine fluoresces) saturate the spotted with diluted Bottom Line or Matrix Miracle and use the spot claw to remove the dissolved urine deposits.



Available in powder or liquid form. Due to silicone formula defoamers are not designed to be applied directly to carpet. This will cause resoiling and voids stain resist warranties. Add defoamer directly to vacuum hose at the hose cuff nearest the wand. If using a portable extractor add it to the recovery tank also.

Knockdown

Defoamers – products designed to eliminate foaming problems in hoses and extractors.

Soil & Stain Protectors

- **Soil retardants** – filled in crevices of the fibers with colorless particles to prevent soil from attaching. Carpets became stiff.
- **Silicones** – great water repellency but not very effective on oil or dry soil. Starting in 1986 **voided stain-resist warranties**. Many silicones cause rapid resoiling.



Fiber Guard



3M-AP1-EA

- **Fluorochemical** – known under trade names 3M Scotchgard and Dupont Advanced Teflon. They improve stain and soil resistance by **lowering the surface energy** of the fabric and creating a barrier.



3M-Scotchgard

- **Factors effecting its performance**
 - Concentration of chemical applied.
 - Surface of the material, the flatter the better.
 - Grooming the carpet helps the penetration.
 - Fabric should be residue free.

We know that Scotchgard works, but is it profitable?

Coverage per concentrate	_____
Purchase price	_____
Cost per sq ft	_____
Average room size	_____
Minutes to spray	_____
Customer cost	_____
Product cost	_____
Sales price	_____
Hourly rate	_____
Gross profits	_____
Homes protected per week	_____
Scotchgard yearly profits	_____

Inspection

In order to properly inspect a piece of upholstered furniture we need to use the correct terminology. Using the proper vocabulary in discussing the piece with the customer allows us to demonstrate our professionalism.

Back cushions, buttons, inside back (behind cushions), outside back, arm top

Top back

Inside arm
Outside



Deck (under cushions) dust cover (under piece) crevice (behind cushions)
Seat edge (kickboard)

Skirt -
Pleated
flat

Zipper is located at cushion back

Cushion top

piping



If the fabric is quilted
the fabric has bumps

seat boxing

Most problems can be prevented by a thorough preinspection, testing and communication of any concerns to the customer. Try to involve the customer in your inspection. They normally feel better and are more likely to accept areas that did not respond as well as they had hoped. This inspection should include a burn test and colorfastness test. Before you do anything such as burn tests, moving the furniture, etc. ask the customers permission and explain why you are doing the procedure.

Inspection Procedures

Burn test using a pair of napping shears cut a small sample from inside the zipper or under the skirt of the fabric. Hold the sample in a tweezers over an ashtray and burn it with a butane lighter. To ID look at the flame, the smoke and residue. This is not conclusive because of the many blends. If you have predominately ash most likely it is a natural fiber. A hard bead is normally synthetic. If the bead smudges it is probably a blend.

Colorfastness test – clamp a white towel on an inconspicuous area that has been dampened with the highest pH chemical that you may use. Ideally give the towel time to dry before you check it. Tests are not conclusive until dry. If there has been no color transfer it should be safe to use. If there is a color transfer go to a milder chemical or a dry cleaning solvent.

Once you have performed these two tests you should have the information needed to choose a cleaning method.

Furniture manufacturers use an ASTM labeling system for colorfastness codes to assist consumers in determining colorfastness to spotting or cleaning agents. **Content label refers to filling materials only.**

S, W, SW, X

S – Dyes are stable to dry solvent-based spotters/cleaners.

W – Dyes are stable to water-based spotters/cleaners.

W-S - Dyes are stable to either water or solvent-based spotters/cleaners.

X – Dyes are not stable to either water or solvent-based spotters/cleaners.

While these labels may be helpful in many cases they are wrong. Ultimately the tech should rely on his testing and previous experience.

Inspection Questions to the consumer

1. **How old is the fabric** – *older velvets were primarily natural fibers. Older fabrics may have been weakened. Dyes may have become unstable. Fading cannot be repaired. Buttons may be metal.*
2. **Has the fabric been cleaned before** –*by a professional gives you an idea that it is cleanable but there may be residue that will cause problems. If the consumer has cleaned it you **know** there is residue.*
3. **Has the consumer ever placed the cushion covers in the washing machine** –*if yes the zippers may be broken, the fabric may be weakened and there may be brighteners on the fabric. The zippers are for ease of placing the cushion not for cleaning.*
4. **Any particular areas of concern** –*if there are hidden problems now is the time to find out.*

Inspection steps (an inspection and black light is handy)

1. **Always start in the same place for consistency** - *back, right arm, inside back, cushions, left arm, deck, dust skirt.*
2. **Unzip cushions carefully** – *inspect the zipper before pulling, look at condition of cushion, look for ink marks or water rings.*
3. **Check stability of legs** – *use skidders*
4. **Check stability of polished cotton glaze** – *use a water drop on back skirt as compared to cushion*
5. **Use a 30X microscope on weaves that have abraded.**
6. **Check for holes tears, rips, stains and color loss.**

If you discover any concerns discuss them with the customer and have them sign a release or invoice listing the concerns. If you do not feel confident of your expertise on a fabric either turn down the job or turn it over to someone in your company with more experience.

Do not let your ego or the customers insistence pressure you into cleaning a risky piece of fabric.

Just because a fabric is expensive doesn't mean it will not bleed, shrink or brown. Normally the more expensive the more risk

Ask yourself – How will this piece look in my living room if I ruin it?

Cleaning Procedures

Following the inspection and discussion with the customer you are ready for the cleaning process.

First set up your cleaning area (normally if you are cleaning carpet and upholstery it is best to clean the upholstery first). Use moisture absorbent furniture pad large enough to provide a 2-foot perimeter around the piece. Move the piece away from walls and any other furniture.

Slowly and thoroughly vacuum the piece. If the fabric has a pile, brush against the grain before vacuuming.

Mist the deck evenly and extract. Precondition the fabric with a chemical that has proven safe on the fabric. Do not spray the whole piece unless it is small enough that the prespray does not dry before extraction. Do not clean cushions on deck. Clean them on drop cloth or work table.

Agitate with a brush, sponge, bonnet or towel. Be sure to agitate in the direction of any float yarns. Do not agitate in both directions on velvets.

Allow sufficient dwell time and then extract. Use a neutralizing formula (acid rinse) either as the rinse or as a post treatment.

Towel the whole piece. Place the cushions on colorfast paper or material. Place them in an inverted V with a Styrofoam block in between the cushions. Place an airmover parallel to the cushions and one at an angle to the piece.

If the fabric is natural velvet use a carding brush after each piece. Brush in all four directions with the final carding laying down the pile. Set up airmovers. If the piece is synthetic the carding may be done as the last step.

Apply a protector as the final step.

Be sure to advise the customer that the cushions should not be replaced on the sofa until the following day. Replacing them too soon may cause bleeding

Problem Fabrics

Fabric	Concern	Procedures
Haitian Cotton Any cellulosic	Browning/shrinkage Weak, low twist yarns Browning/shrinkage	Use a Haitian Cotton formula Agitate with filling yarn Moderate pH prespray, acid rinse, speed dry
Natural fiber velvet	Texture distortion	Heavy prevac, moderate pH prespray Card each piece immediately, continue fluffing until dry
Jacquard fabric	Bleeding	Be sure to pretest chemicals for colorfastness. Moderate pH prespray, acid rinse, speed dry
Polished cotton/chintz	Loss of sheen/polish	Pretest with water drop on back skirt, compare to worn areas. Clean normally.
Silk	Color loss Texture loss	Pretest for color fastness, Use neutral to acidic prespray. No agitation. Moderate heat only. Wet evenly to avoid rings. Speed dry.

Partitions, Workstations & Walls



These materials are mostly synthetic and can be successfully wet cleaned. These fabrics act as filters and normally have a high percentage of dry soil. Brushing and prevacuuming can make a dramatic improvement.

In most building these materials are seldom if ever cleaned. Demonstrate how soiled they are by placing a thin white towel over a vacuum hose and vacuuming a small area. The towel will have a solid black circle when you are finished.

Remember this saying “**A presentation without a demonstration is just a conversation.**”

Upholstery equipment & chemicals list

<u>Equipment</u>	<u>Chemicals</u>
Extractor preferably with heat	Presprays – high pH, neutral, acidic
Dry cleaning machine	Solvent detergent
2-3 upholstery tools	Detergents - high pH, neutral, acidic
small vacuum	Acid rinse
buckets	Shampoo
immersion heater	Dry foam - acidic
2 furniture pads	Haitian cotton formula
nylon bristled brush	Browning formula
horsehair brush	Spotting kit including VDS, NVDS,
carding brush	ADS, AS, NDS, Rust Remover,
tamping brush	Enzyme, Oxidizer, Reducer,
finishing brush (soft)	pH paper, bone spatula, eye droppers
sea sponge	Deodorizer – water/ solvent based
bonnet mitt	
spray bottles	
pressure sprayer	
2 small air movers	
6 plug adapters	
24 clean white towels	
lint roller	
measuring cup	
pilling shaver	
PPE - respirator, goggles, gloves	
MSDS	
Work table	
Furniture tabs	
HD stapler	

Carpet Cleaning Procedures in the Home

Now that you are an expert in the fields of fiber, carpet, chemistry, principles of cleaning and spotting, it is time to put all that knowledge to good use. While having the technical expertise is critical even more important is how the technician relates and communicates to the customer. The choice of one or two technicians is up to the company. The consumer who is most likely female would prefer two technicians for a couple of reasons:

- she feels safer with two people.
- she feels her furniture will be properly moved.

Two technicians will not complete the job in half the time of one technician but they will be much faster and more efficient. Two technicians usually are more cost effective for the company. The second technician can also be clean upholstery or other material in the home while the first tech cleans carpet.

Once you have parked that clean van where the customer can see it immediately head for the front door.

Greeting the customer

- ✓ Knock on the door and step back from the door.
- ✓ When the customer answers, smile and hand her your business card.
- ✓ After the customer has invited you in place a mat and wipe your feet.
- ✓ Look at your clipboard and ask the customer to show you the areas to be cleaned. A good **preinspection and communication** of your findings will prevent complaints and instill confidence in the customer.
- ✓ As the customer gives you a tour write down any and all comments on your invoice. Ask the customer pertinent questions.
 - How old is the carpet
 - Any spots or areas of concern
 - Any pets
 - Bad seams, ripples, loose carpet
 - Previous cleanings
 - Any health concerns of occupants
- ✓ Perform a burn test and colorfastness test if needed.

- ✓ Review the areas of concern with the customer and explain what you will do to take care of these areas. Do not over promise. Set realistic expectations for the customer. Clean a “magic square.”
- ✓ Start in the **furthest area** of the home unless the customer requests otherwise.

Cleaning – follow the principles of cleaning.

- ✓ Prevacuum edges and entryways. Give extra attention to traffic areas.
- ✓ Move furniture away from walls and clean perimeters first. Remember to **tab and block all furniture** to prevent staining. Once perimeter is cleaned the open areas of the room can be cleaned. Move furniture back to exact location where you found it.
- ✓ Precondition and agitate.
- ✓ Perform extraction. Overwetting is normally caused by technician error. Not enough extraction passes, improper technique or faulty equipment can cause this.
- ✓ Apply post treatment chemicals. Protectors are always applied last. Be sure to wipe up any overspray.
- ✓ Groom carpet. This helps the carpet to dry, and improves the overall appearance. Grooming also helps to spread and allow penetration of post treatments.
- ✓ Dry carpet. Use airmovers. Turn on ceiling fans with customer’s approval. Check ceiling fans for soil accumulation before activating. Best drying temperature is between 70-72°. Carpet should dry within 6-8 hours.

Customer consultation

- ✓ Review the job with the customer. Make sure everything has been done to her satisfaction. If she has any concerns, even if you think you have done everything possible, try it one more time. Make one final trip through the home to make sure you didn’t leave anything behind.
- ✓ Ask for the check number.
- ✓ Give her tips on maintaining her carpet. Explain the drying process and why it is best for people and pets to stay off the carpet till it is dry. Provide her with traffic lane paper or booties. Emphasize the importance of frequent vacuuming. It is a good idea to inspect her vacuum and point out any concerns e.g. belts, bags, and brushes.
- ✓ Thank the customer for her business and leave business cards for her friends and neighbors.

Leaving the job

- ✓ Be sure to walk around your van and close all the doors. Check for kids, bikes, and the family dog etc.
- ✓ Pick up any balls of fuzz in the driveway that came from your vacuum hose.
- ✓ Back out carefully.

Post job

- ✓ Dump waste in a manner approved by local, state and federal guidelines. The wastewater must go to a wastewater treatment facility.
- ✓ Clean and refill sprayers and containers.
- ✓ Wash the van.
- ✓ Organize the van for the following day.

Spotters for your customer

How do you feel when you see that bottle of Resolve, Glory, Woolite or Natures Miracle on your customers counter? Well you can prevent that from happening. Provide them with your own personalized spotter. This way you know they have a spotter that works and when it is time for cleaning they have your name and phone number without going to the Yellow Pages.



Problems & Solutions – a chance to show your skills

Browning

- Browning is caused by, **overwetting, slow drying** and **cellulosic** material such as cotton and jute. It is accelerated by alkalinity. The culprit causing the problem is **lignin**, a naturally occurring gum. In the presence of moisture it breaks down and is transported to the surface. Most of the backings that are used today on tufted carpets are synthetic. The only way to have true cellulosic browning is to have cellulosic materials involved. On the rare occasion that you would encounter browning on a synthetic carpet it is much **easier** to remove. Normally because browning is caused by alkalinity it is cured by an acidic application. In the old days this was called souring. Today we use formulated browning formulas, acid rinses, mild reducers or hydrogen peroxide. is chosen it should be lightly misted or applied to the tips only of the carpet.



Target Tannin Stain Remover

Wicking

- A common misconception is that wicking is browning. Wicking is the **upward migration of moisture in a fabric**. The best analogy is that of a kerosene lantern. The oil wicks the bottom to the top of the wick and is lit. This process is referred to as capillary action. The difference between wicking and cellulosic browning is the absence of cellulose in synthetic carpet. The discoloration found on the tips of synthetic carpets especially on olefin Berber's is soil. Due to the **lack of dry soil removal** prior to wet extraction soil

wicking is a major problem today. Overwetting and slow drying increase the chances of wicking.

Wicking occurs in spotting situations when the residue of the contaminant or the spotter wicks to the surface during drying. If you suspect this may happen, the final step after rinsing is to apply a poultice of absorbent material such as paper towels to the top of the spot. Place a weight on top of ½ inch of paper towels and allow it to dry. The moisture and residue will continue to wick into the towels.



Absorb-A-Stain



ARA

Yellowing - comes in many forms.



Citric Acid

- **BHT** (butylated hydroxy toluene) is an antioxidant that has been used primarily in carpet cushion. It was believed to have been the cause of yellowing on carpet and its use has been discontinued in the manufacturing of cushion. To remove dilute citric acid and spray and agitate on the tips of the carpet. Citric acid may dry to a harsh crystal and should be vacuumed and rinsed with an acid.

- **Pesticides** – applied to the perimeter of the carpet may attack a primary color and cause a color change. This damage is permanent.
- **Optical brighteners** – reflect the blue-white part of light. Use of OB's on carpet may cause a permanent yellowing.
- **Ozone** – attacks the blue dye and may leave a permanent yellowing.
- **Soiling** – soil can cause yellowing especially on blue or gray carpet. Cleaning using maximum soil suspension can remove yellowing.
- **Tracked in oils** from parking lots, warehouses etc.
Maximize soil suspension.

Soil Filtration



- The name aptly describes the problem. The microscopic particles of soil that continuously float in the air are filtered by the fibers usually along the perimeters of the room and under closed doors. Much of this soil is carbon and other non-soluble forms of soil with an oily residue that only complicates the removal. Removal will once again use the principles in an aggressive manner. Staining may be permanent.
 - Thorough vacuuming by hand.
 - Specially designed chemical or aggressive preconditioner heated if possible.
 - Hand agitation or tamping brush.
 - Hottest rinse extraction possible.
 - Groom & dry.

Streaking

- Clean or dirty streaks in carpet caused by:
 - Improper wand stroking
 - Blockage of vacuum slot or Tjets
 - Wicking
 - Improper preconditioning (clogged sprayer tip)
 - **Prevent by proper cleaning technique and equipment. Correct by bonneting**

Ready to go?

Van ready



How about your equipment?



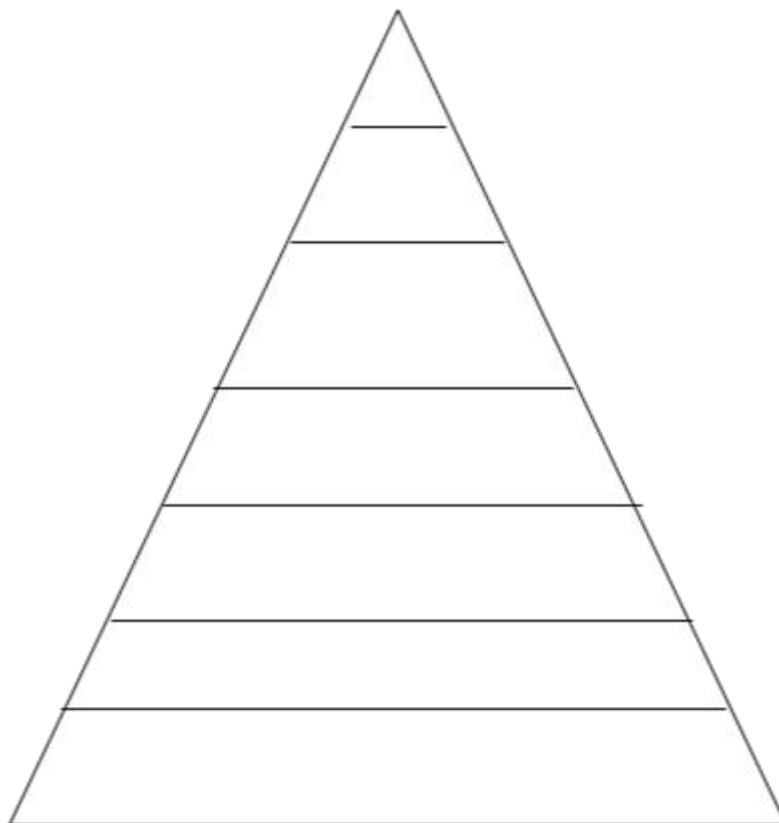
How about your tools?



Finally are you ready?



pH Chart



1. Fill in the numbers 0-14
2. Fill in the powers 10- 10 million
3. Place the words alkalinity, acid, neutral, soil, detergent
4. Mark the safe pH range for cleaning wool

Write acid or alkaline next to the spot.

1. Coca Cola _____
2. Rust _____
3. Coffee _____
4. Fresh urine _____
5. Wine _____

Choose the solubility: water
(W)/solvent(S)/insoluble (I)

Hair_____	Wine_____
Sand_____	Ketchup_____
Coffee_____	Ink_____
Lipstick_____	Gum_____

Thanks for being here.

We are here to help.

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Attendance at Carpet Markets and or Carpet Market workshops.

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