

**MARC**



# Carpet Care Manual



## INTRODUCTION

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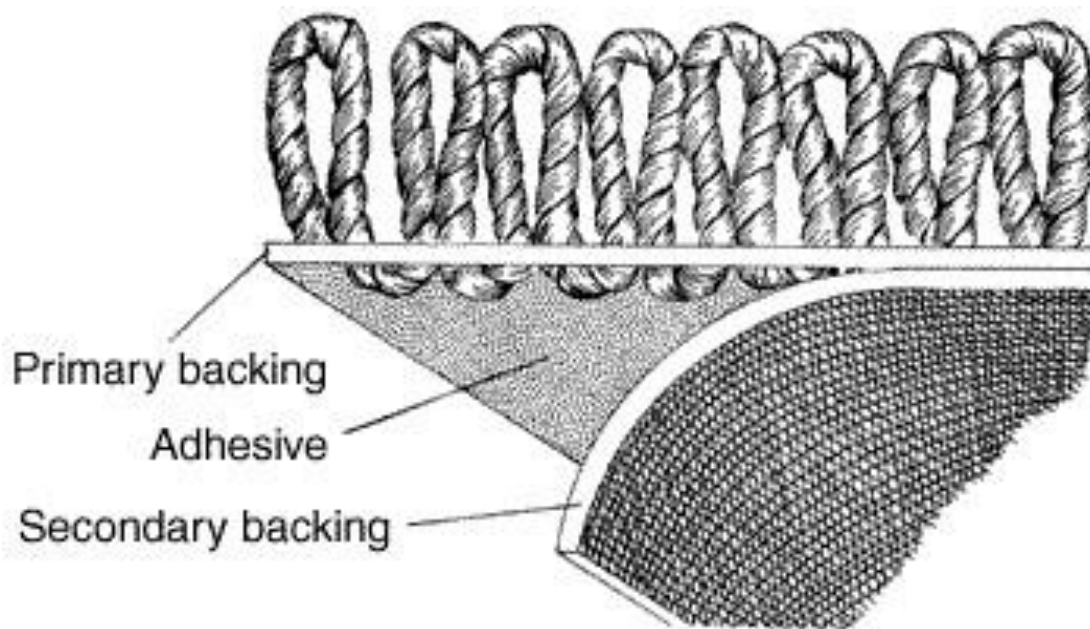
The driving force behind the invention of better carpet cleaning methods and products was the need to improve public health, safety, sanitation and the efficiency of cleaning workers. In addition to these forces was the present desire to maintain a better appearance level of carpet while extending its useful life in a commercial or institutional facility.

## A BRIEF HISTORY OF RUGS AND CARPETS

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Today, most carpet production (94%) is tufted carpet. Tufted carpet is produced 15 times faster than woven carpet. The faster production time greatly reduces the labor costs during the carpet manufacturing process.

In order to achieve dimensional stability in tufted carpet it is necessary to apply two layers of “backing” (double-backed tufted carpet) to the carpet. The backing directly beneath the pile yarn is called the “primary” backing. Attached to the primary backing by a layer of rubber or latex is the “secondary” backing. The original backing on tufted carpet was “jute”. Jute is a natural burlap that when over-wet was subject to shrinkage, dry rot and seam popping. Presently, the backing of tufted carpet is made from a synthetic material called polypropylene (olefin). Polypropylene backing will not accept moisture so the shrinkage, dry-rot and seam popping associated with jute backing is impossible; even if the carpet is over-wetted in the cleaning process.



## **THE MAJOR TYPES OF CARPET FIBER**

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The largest selling type of commercial carpet consists of nylon pile yarn. Nylon carpet has developed and improved over the years. Each succeeding breakthrough in nylon carpet manufacturing is called a “generation”. The five generations of nylon carpet are:

- Generation 1: Delustered or dull fiber. Round fiber in cross-section.
- Generation 2: Soil-hiding. Multi lobal, or multi-sided fiber in cross-section. These fibers produced static electricity.
- Generation 3: Anti-static, multi-lobal, soil hiding.
- Generation 4: Stain and soil resistant. Covered with a coating of fluorocarbon similar to Scotch Guard or Teflon. Anti-static, multi-lobal, and soil hiding.
- Generation 5: Stain resistant, anti-microbial, anti-static, multi-lobal, and soil hiding. These fibers are anionic, or negatively charged, and should be cleaned with anionic or non-ionic cleaning solutions (not cationic solutions). Dry cleaning solvents may cause the stain repellant to lose its efficacy.

### **TYPE # 1 Polypropylene (olefin)**

A synthetic pile yarn fiber used extensively for outdoor carpeting.

### **TYPE # 2 Polyester**

Is an inexpensive carpet pile yarn that is used principally in residential installations.

### **TYPE # 3 Wool**

A minor (1% of the market) but important fiber in carpets is the oldest carpet fiber, wool. Wool is beautiful, expensive and must be maintained properly and carefully.

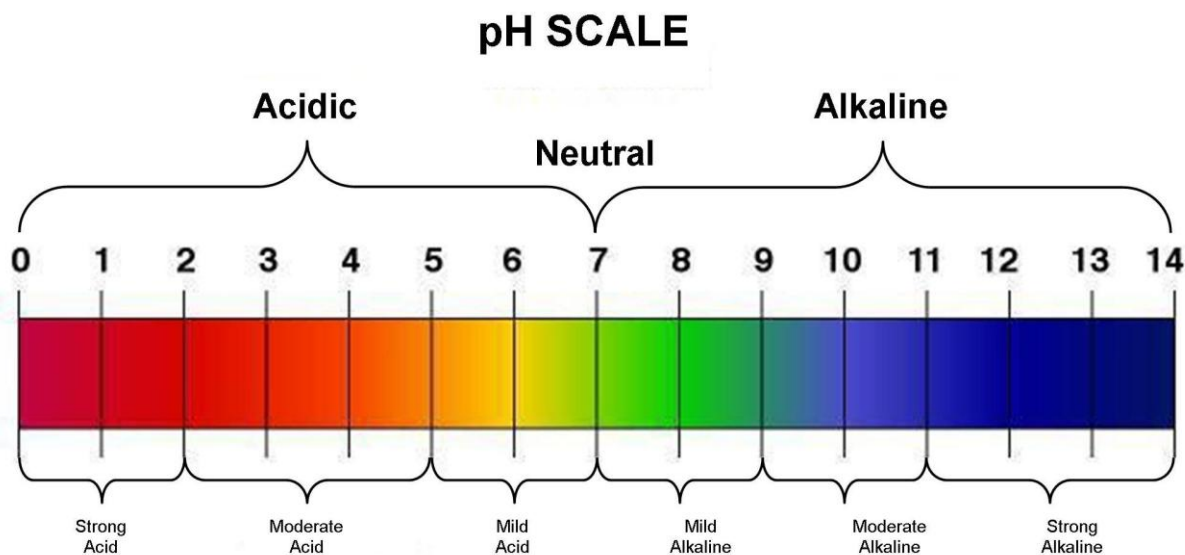
When cleaning wool carpet, extreme care should be taken to avoid over-wetting and high alkaline cleaners. Improper chemicals on wool carpets cause “alkaline browning discoloration”. Browning is an easily remedied condition when a “brown-out” treatment is applied to the carpet. Over-wetting a wool carpet can cause jute-bleeding discoloration from backing yarns used in carpet weaving process.



## THE IMPORTANCE OF CHEMICAL pH TO CARPET FIBER

An important factor that affects the cleaning of stain resistant 4<sup>th</sup> and 5<sup>th</sup> generation nylon carpets is the pH of the detergents or shampoos used in the cleaning process. Chemical pH may adversely affect the performance of the carpet so it is important to understand the basics of pH as they pertain to carpet care.

In chemistry, pH is a quantitative scale for measuring the acidity or alkalinity of liquid solutions. The scale runs from the number 0 to 14. The number 7 on the pH scale is neutral, not acid or base. The number 0 on the pH scale is a strong acid. 14 is a strong alkali. In the cleaning industry the word “alkali” is used to denote base. So the pH scale runs from 0 (acid) to 14 (alkali).



On the pH scale each full number increase represents a tenfold increase of the acidity or alkalinity of the solution. It is a geometric progression by the number 10. So pH of 1 is 10 times more powerful than pH of 2. The pH of 2 is 10 times more powerful than the pH of 3 and 100 times more powerful than the pH of 4.

The numbers on the scale denote the “strength” characteristics of the solution not the “quantity” or dilution of the solution. Whether you have a drum of lye or a tablespoon of lye they both have the same strength characteristics (pH).

In order to prevent damage to carpet, the carpet cleaner should leave the carpet as close to 7, on the pH scale, as possible. The manufacturers of all stain resistant and 4<sup>th</sup> or 5<sup>th</sup> generation nylon carpets require a cleaning solution with a pH of 10 or below. Also, the major fiber producers on most nylon carpets require a water temperature of below 150°.

## THE IMPORTANCE OF CHEMICAL pH TO CARPET FIBER

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If a chemical with a higher pH than 10 is used, it will void the guarantee of these carpets from the manufacturer. High alkaline detergents and shampoos will also damage wool carpet. On other types of carpet a pH of 12 is the maximum that should ever be used.

Carpet pile fibers are dyed in acids with a pH of 2. That is why high alkaline cleaners may cause alkaline browning of light pile fibers

## PREVENTIVE MAINTENANCE

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Preventive maintenance refers to reducing or preventing soiling of the carpet. The three elements of preventive carpet care:

- Catch Dirt at the Door
- Remove Loose Soil Frequently (Vacuuming)
- Spot Carpets Effectively

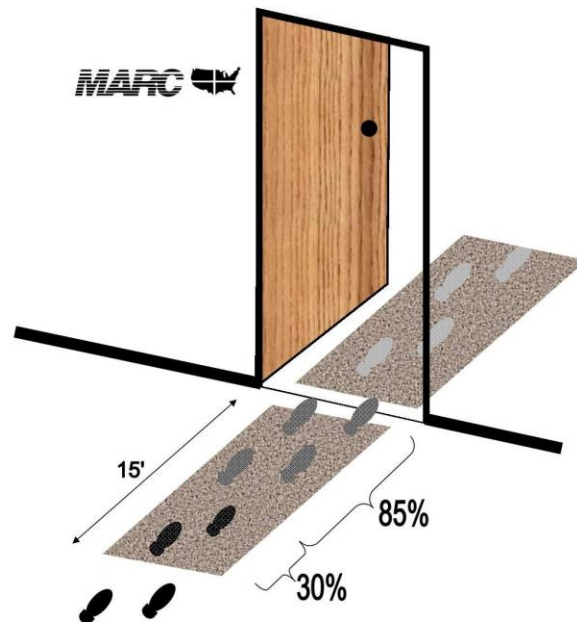
### CATCH DIRT AT THE DOOR

Approximately 70% of carpet soil is tracked in from outdoors via foot traffic. The rest of the building stays cleaner if dirt is collected and held at the entry point. To catch dirt at the door there are two important strategies. The first is to keep entrances clean outside. Clean entrances that are free from dust and litter outside reduce what may be tracked or blown into the building and carried throughout the building. Frequent sweeping and cleaning around building entrances will reduce the amount of damaging soil that enters any facility.

Sweeping entrances is accomplished with brooms or mechanical and powered sweepers. Water brooms, pressure washers and automatic scrubbing machines aid washing the entrances.

The second element that keeps dirt at the door is to provide adequate, clean mats and matting at all entrances to the building.

Entrance mats and walk off mats catch and hold large amounts of tracked in outside soil. At the door a 12 to 15 foot entrance mat traps 30% of the incoming soil within the first three feet, and 85% is trapped within 15 feet. Also, walk-off mats should be placed in front of service elevators, which are also the source of soil entering a building from the outside.



## THREE METHODS CLEANING CARPET

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### 1) CARPET BONNETS OR SPIN PADS

Bonnet or Pad cleaning features the use of a standard speed single disk rotary floor machines (usually 175 rpm). A pad driver is attached to the floor machine at the clutch plate to hold and drive the bonnet or spin pad. Either a yarn bonnet or a synthetic carpet-cleaning pad is treated with cleaning solution and placed underneath the driver pad on the floor machine.

Bonnets are thick, mop-like products that are blended of cotton and synthetic yarn and designed to both clean and absorb cleaning solution on the carpet. Synthetic pads are thinner disks and similar to the buffing pads used in hard floor maintenance. Pads are made of white, non-woven, polyester fiber and are designed to clean and absorb without abrasion.

Chemical cleaning solutions formulated for the bonnet cleaning operation generally have two major requirements: the cleaning solution should be low suds or suds-less and it should contain a high proportion of carpet cleaning solvents and a lower amount of detergents. The solvents remove greasy soil and detergents clean the fibers. A pH range of 7 to 9 is recommended for the cleaning chemical.

The cleaning solution may be spray misted directly on the carpet area to be cleaned or applied through a shampoo tank that is attached to the handle of the machine and is dispensed through a “flow-through” type assembly on the machine. An aerosol product may also be used to apply cleaner from a specially mounted applicator on the floor machine.

Soil is loosened from the carpet through the chemical and mechanical action of the process and is absorbed into the bonnet or pad. The process wipes up attached soil and grease off the top portion of the carpet. Bonnets and pads need to be turned over or exchanged for clean ones periodically as they become soiled. Later the soil is cleaned out of the bonnet or pad by rinsing or washing it thoroughly. No vacuuming is required after a bonnet buffing cleaning procedure has been performed.

Drying time is affected if the cleaning operator uses the spray-type method vs. the tank flow-through method. The spray-type method has virtually no drying time, the tank flow method requires approximately 30 minutes to one-hour dry time on the carpet.

### 2) DRY FOAM CLEANING

Another method of key-area cleaning is dry-foam cleaning. In this process carpet shampoo solution is generated into a cleaning foam. This dry-foam is massaged into the carpet using a brush attached to the foam machine. After the foam has been brushed into the carpet it is removed into a vacuum shoe. Some dry-foam machines are fitted with a vacuum so that the foam generation, brushing and vacuum pick-up are accomplished during one pass of the machine. Other machines require a separate vacuum pick-up, after the dry-foam machine has completed the cleaning process.

The shampoo used in the dry-foam machines breaks down greasy soils and absorbs some sandy soil is removed through the vacuum process.

### 3) EXTRACTION CLEANING

Most carpet fiber manufacturers and carpet mills recommend periodic, thorough cleaning of carpets performed by well-trained and experienced carpet cleaning personnel. Hot water extraction is the method of deep rinse cleaning the entire carpet. Hot water extraction has also been called “steam cleaning” but actual live steam (gas created at water’s boiling point) is not employed in the cleaning process. Hot water extraction is deep cleaning process that removes embedded soils that have been carried or blown into the carpet.

A hot water extraction machine has a pump, which dispenses water, under pressure, through spray nozzles into the carpet. This spray is an emulsion of heated water, solvents and detergents that are designed to dissolve greasy soils. The spray rolls sand and dirt into an attached vacuum shoe that sucks the dirty solution back into a holding tank on the extraction machine. Generally the cleaning process is aided by an attached scrub brush that is located between the spray nozzles and the vacuum shoe on the cleaning head of the extractor. The brush scrubs greasy, attached soils from the carpet fiber.

The removed soil is held in the tank until it may be disposed of later in the sanitary drain, toilet or proper waste facility. Solutions should not be dumped onto the ground outside, in storm sewers or in the streets.

In hot water extraction cleaning it is important to use detergents that are not too strong (or too alkaline). They may damage the carpet. A pH of 10 is preferred to many carpets (see the section about pH). With fine wool carpets and acid pH detergent or an acid rinse following the cleaning process is recommended. Care must be taken with wool carpet not to over-wet the fiber and cause shrinkage. If there is any question about the proper cleaning solution contact the manufacturer of the carpet.

When carpet is extracted using the hot water extraction method remember the following tips:

1. Vacuum the area to be extracted thoroughly, before you use the extraction equipment. A cleaning solution will only carry a certain amount of soil. Don’t use the valuable solution, time and equipment of the hot water extraction process to remove loose soil that could have been removed by vacuuming. Use the extraction process to clean deep, embedded soil. (MARC 247, MARC 702)
2. Apply a prespotter on heavily soiled areas prior to extraction. Wait the recommended time before beginning the cleaning process. (MARC 226 Bio-Zyme)
3. Avoid over wetting the carpet. Prolonged dampness may promote growth of mildew and bacteria in the carpet or cause the carpet to delaminate from its two backings.



4. Dry the carpets as quickly as possible. Speed drying is aided by using carpet-drying fans to move air across the carpet.

## **CARPET PROTECTORS**

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Carpet protectors can offer real tangible benefits in carpet-cleaning program. Carpet protectors significantly reduce the amount of various types of soil accumulating on the carpet fibers. If a carpet is soiled it is necessary to clean it thoroughly with an extraction process before applying a carpet protector. (MARC 204)

## **CARPET SANITIZING CLEANERS**

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The soil in carpet is frequently laden with harmful microorganisms. Bacteria grow in a warm, dark, moist environment. This is the condition present down in the carpet fiber. The bacteria and pathogenic micro-organism that grow in the carpet fiber may be reduced each time the carpet is cleaned with a wet cleaning solution.

To control odor-causing bacteria levels it is necessary to use an EPA registered Carpet Deodorizer. (MARC 10). To guarantee that you are using a carpet deodorizer which reduces bacteria when you bonnet or extract a carpet, check to see that it contains an EPA number on the bottle. Be sure to follow label instructions carefully. It is a violation of Federal Law to use an EPA registered product other than as directed on the label.

Controlling odor-causing bacteria when carpet is cleaned adds another level of comfort to those who come in contact with the carpet.



## **SPOT & STAIN REMOVAL**

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### **CARPET SPOTTING**

All stains are either water soluble or solvent soluble. Solvent soluble stains require solvents to redissolve the stain and release it from the carpet. Water-soluble stains are neutralized using alkaline and acid based spotting agents. Stains are neutralized by using a spotting agent of the opposite pH value of the stain.

Neutralize acid stains by using an alkaline spotting agent.

Neutralize alkaline stains by using an acid-spotting agent.

Some stains have no pH because they are waterless stains. You must use a neutral product (solvent) to remove these stains.

Acid spotting agents work very quickly.



Alkaline spotting agents take a minute or so to work.

## **SPOT & STAIN REMOVAL GENERAL SPOTTING RULES**

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1. Apply water before and after most spotting procedures except for inks!
2. Spot inks on the solvent or dry side.
3. Generally rinse all spotting agents free from the carpets as these can set up their own stains if left in the fabric.
4. Remove obvious spots from the carpet before: shampooing, bonnet buffing or extracting.
5. When in doubt concerning loose dyes or sensitive colors or fabrics, it is wise to first test the spotting agent in an inconspicuous area of the carpet.

### **CANDLE WAX**

1. Scrape up all excess wax using a paint scraper or trowel.
2. Using white absorbent paper towels or cloth towels over the wax area, apply a hot iron to the top of the towel. The candle wax will transfer itself onto the paper, which is more absorbent than the carpet.

### **WATER STAINS**

Water stains or rings are areas of concentrated foreign matter or dirt that have floated out or migrated forming a stain or ring that extends as far as the quantity of moisture or initial water allowed on the carpet. (MARC 157).

### **GENERAL INK STAINS**

Ink stains have many origins because of the highly variant formulations used in making different inks. Since most inks are removed on the “dry” side (solvent type MARC 163) the use of any water should be initially avoided. Water used on the ink stain initially could have a spreading action.

### **CHEWING GUM**



Spray MARC 119 – Gum Off directly onto the gum deposit until it becomes brittle. Chip and lift the brittle gum deposit from the carpet.

## CARPET TIPS

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To find out the generation of the carpet, a simple test is to put a couple drops of water on the carpet, if it absorbs it is IV generation or older. If the water remains on top, then it is V generation carpet.

To pre-treat traffic lanes prior to shampooing IV generation carpet or older, use MARC 238 Lift Off. Be sure not to saturate or let stand too long.

Whatever carpet stain is to be removed, low pH or high pH, acid or alkaline, and use the opposite when "spotting".

"Browning" is a condition that sometimes occurs after the cleaning operation when the carpet has dried. It may appear as a yellowish brown spot. It can be caused by either of two conditions.

1. Over-saturation of soaps or cleaners; or
2. Over-saturation of too high pH, alkaline detergent or cleaning solution.

Be sure to shampoo or extract with a solution with a pH below 10.

Color change is a chemical reaction to either an alkaline or an acid agent. Blue carpets usually turn pink and green carpets usually turn blue. Applying a spotting agent of the opposite pH can reverse this color change.

Color loss is a chemical reaction that allows the dye to be removed by the cleaning process. The dye actually leaves the fiber and it cannot be reversed.

**ACID** – Any substance, which when dissolved in water, yields a pH below 7.

**ALKALI** – Any substance, which when dissolved in water, yields a pH above 7.

**ANIMAL STAIN** – Discoloration of the carpet caused by animal urine.

**ANTI-MICROBIAL** – A chemical that prevents the growth of mold, bacteria, mildew, etc, reducing their destructive action to carpet and eliminating accompanying odors. Applied to carpet at mill level, built into some fibers and applied on location.

**ANTI-STAT** – A chemical substance applied to the carpet, or a special backing to reduce static electricity to acceptable levels.

**BIODEGRADABLE** – Has the capability of becoming decomposed by naturally occurring Microorganisms.

**BLEACH** – An oxidizing or reducing agent used to remove color.

**BLEEDING**– This is a loss or transfer of color from one section of the carpet to another, usually under hot-wet conditions.

**BRIGHTENERS** – Optical; whiteners or fluorescent whitening agents used in cleaning process. Under the influence of ultraviolet light, emit a visible blue-white light.

**BROWNING** – A yellow or brownish discoloration of the carpet's face, usually caused by impurities in cellulosic fibers, such as cotton and jute, which wick up to the face fibers on over wetting.

**DEFOAMER** – A surface-active agent that is used in cleaning to reduce detergent foaming.

**DEGREASER** – Solvent used in the cleaning process to remove heavy oils or grease from the carpet.

**DEODORIZER** – Products specifically formulated to destroy, mask or modify unpleasant odors from carpet.

**DETERGENT** – Any substance that is capable of dislodging, removing or emulsifying soils. Generally, the term is used for formulated products that contain surfactant builders, solvents, etc.

**DISINFECTANT**– Any agent used to completely destroy all harmful bacteria. Labeling for such materials require proof of effectiveness for registration with EPA.

**FATTY ACIDS** – Oily, acidic materials that are formed by degradation of animal tissues.

**MILDEW** – Fungus growth that can occur on carpet fibers. Causes odor and fiber degradation.

**MICRO** – So small as to be undetectable to unaided human senses.

**OZONE** – A highly reactive gas and strong oxidizing agent formed by passing a high voltage current through air. Used as a deodorizing agent.

**pH** – A number in the range of 0 to 14 used to express the degree of acidity or alkalinity of a dilute solution. Below pH 7, the acidity increases as the number approaches 0. Above pH 7, the alkalinity increases as the pH approaches 14. pH 7 indicates a neutral solution.

**SANITIZER** – An agent, which yields a significant reduction in the level of harmful bacteria. Legal labeling requirements for sanitizers are not as stringent as those for disinfectants.

**SHAMPOO** – Generally a high foam detergent preparation used for rotary cleaning or for in plant cleaning.

**SOIL RETARDANT** – An agent that is applied to the carpet to retard or decrease the rate of soiling.

**STAIN REPELLANT** – An agent that is applied to the carpet's surface which primarily acts as a water repellant.

**SURFACTANT** – Specifically, a surface-active material used in detergent formulations as a wetting or penetrating agent, emulsifier and dispersant.

**WATER HARDNESS** – The amount of metallic salts, such as calcium, magnesium or iron, dissolved in water. These can form insoluble "curds" with some surfactants and reduce the effectiveness of the cleaning.



## MARC CARPET PRODUCTS

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1. M-10 QUATRA-CIDE
2. M-17 HYDROGEN PEROXIDE CLEANER
3. M-53 GOT-A-MESS
4. M-119 GUM-OFF
5. M-156 STAIN MASTER
6. M-157 SPOT OUT
7. M-163 MAGIC SOLVENT SPOTTER
8. M-204 DEFENDER CARPET PROTECTOR
9. M-208 BACTERIZER
10. M-226 BIO-ZYME CLEANER SPOTTER
11. M-227 CARPET DEFOAMER
12. M-247 XTRACTOR
13. M-256 ORANGE CRUSH
14. M-283 CARPET SPOTTING TOWELS
15. M-702 TRUE GREEN CARPET EXTRACTOR
16. M-827 CARPET BONNETS WITH STRIPES

## STAIN REMOVER GUIDE

	M-17	M-156	M-157	M-163	M-208	M-226	M-256	M-283
ALCOHOLIC BEVERAGES			X					
BEER	X							
BERRIES	X							
BLOOD	X	X			X	X		X
CHOCOLATE	X				X	X		
COFFEE	X		X					X
CRAYON				X				
FRUIT JUICE	X							X
GREASE	X		X	X	X	X	X	X
GUM							X	
INK	X		X	X				X
KETCHUP	X		X		X	X		
KOOL AID	X		X					X
LIPSTICK				X	X	X		
MILK		X						
MUD			X					
MUSTARD	X				X	X		
OIL			X		X	X		X
SOFT DRINKS			X					X
TAR				X				
TEA	X		X	X				
URINE	X	X	X		X	X		
VOMIT		X			X	X		
WINE	X	X						X

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