RTS
Restoration Training Services

The Cleaning Basics 101 Series:

Commercial Carpet Cleaning

By Cleaning Industry Author Mark W. Exner

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Since 1972, the Institute of Inspection, Cleaning, Restoration and Certification (IICRC) has provided the standardization for the cleaning and restoration industry promoting professionalism and certification. To contact the IICRC, visit www.iicrc.org. The IICRC is the centralized standards and certification body of the cleaning and restoration industry.

Filaments and Dye Sites

1. Carpets are made from yarns.

2. Yarns are made of tiny strands called filaments.

3. Filaments contain Dye Sites.

1. All yarns are made up of multiple small strands called filaments. Each yarn type may contain veritable amounts of filaments.

2. On the face of each filament are the **dye sites,** found on all yarn filaments except olefin. All filaments will vary in the size of their dye sites, and the total amount of the dye sites on each filament. This makes each filament varying in its rate of absorbency.

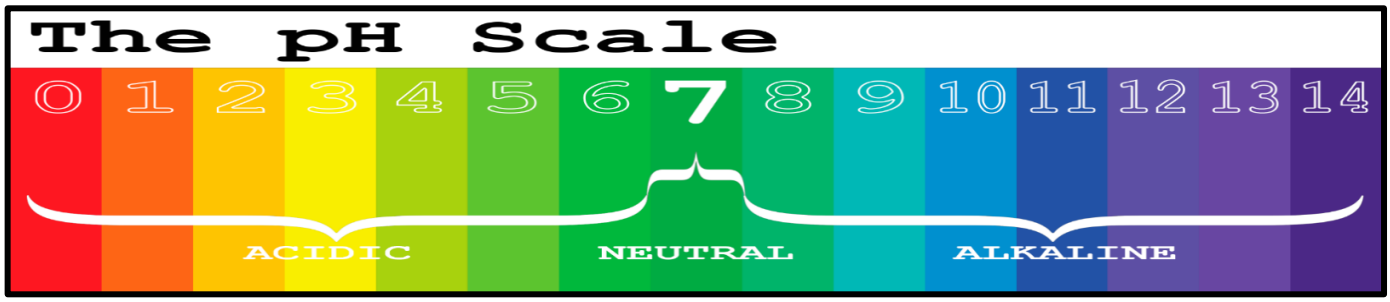
Carpet Yarns Approximate Absorbency Rates:

Wool	**30 %**	**Natural**
Cotton	**16% – 17 %**	**Natural**
Jute	**Same as cotton**	**Natural**
Nylon 6	**5 %**	**Synthetic**
Nylon 6, 6	**4 %**	**Synthetic**
Polyester	**Less than 1 %**	**Synthetic**
Triexta	**Less than 1 %**	**Synthetic**
Olefin (Polypropylene)	**0 %**	**Synthetic**

1. Natural yarns are from a natural source; wool, cotton silk, sisal and others.
2. Synthetic yarns are manmade. They originate from oil - either petroleum or corn oil.

MODULE 3 CHEMISTRY 101: THE ROLE OF pH

pH and its Basic Outline



NEUTRAL 7 pH
EQUAL PARTS ACID AND ALKALINE

Mildly Acidic Mildly Acidic	6.9 to 5.0	7.1 to 8	Mildly Alkaline Mildly Alkaline
Medium Acidic Medium Acidic Medium Acidic	4.9 to 3.0	9 to 10	Medium Alkaline Medium Alkaline Medium Alkaline
Medium Acidic: Strong Acidic:	2.9 to 2.0 1.9 to 0	11 to 14	Strong Alkaline Strong Alkaline

Chart numbers above are for demonstrative purposes only.

When cleaning, we must address the strength of our cleaning solutions. They can be measured **two** ways:

1. by their pH, or powers of hydrogen,

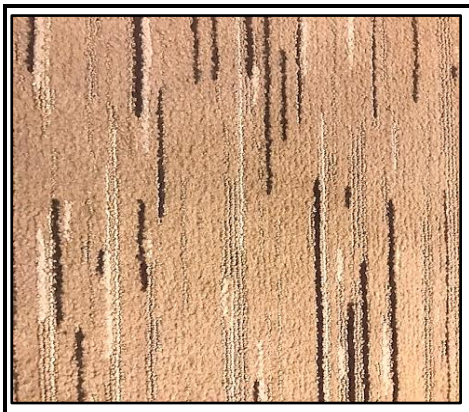
2. by their concentrations which we apply them. pH is a measurement of acidity, neutrality, and alkalinity of a water-based solution. Acidic solutions are also known as “soure.” Alkaline solutions are also known as “hot” or “base.

MODULE 4 THE YARN CHARACTERISTICS: SYNTHETIC YARNS

1. NYLON

Nylons' Background:

- First developed by DuPont in the 1930's, nylon became the world's first 100% synthetic (man-made) yarn.
- Nylon has an affinity, or natural attraction, for absorbing acid dyes. You probably already know acid dyes. Acid dyes are food coloring, found in nearly everything we eat and drink. Therefore, nylon yarns, left unprotected, will readily stain with acid dyes.



Color loss from bleach

Color loss from sunlight (UV) fading

No color loss when solution dyed

NYLON CLEANING CONCERNS:

Nylon Advantages:

1. It is very resilient. It will spring back up when walked on, or after cleaning.
2. Nylon is oil resistant. It can release oily soils better than any other yarn. Nylon tends to give cleaners the best chance to remove oils.
3. Nylon hides soils. Nylon is the best soil hiding synthetic yarn.
4. Nylon has a soft hand.

Nylon Disadvantages:

1. Nylon is absorbent to water, and water based staining material –acid & disperse dyes.

2. May require extensive dry times after cleaning, more than any other synthetic yarn
3. May be discolored from bleaches, sunlight (windows, sliding doors, skylights), and other atmospheric contaminants such as gas stoves, etc.

Two Types of Nylon – Type 6,6 and Type 6

There are two types of nylon made today: and they are Type 6,6 and Type 6. Each is a little different for the cleaning technician, although we must note *they are to be cleaned the same,* but often with some differing results. The difference could be a 20% difference in removing stains, and a 20% longer dry time.

Type 6,6

- Dye Sites are smaller and fewer in number on the face of filament
- Tends to hold color against sunlight (UV) fading, and atmospheric contaminants like gas stoves, that promote fume fading.
- Tends to dry faster when cleaned.
- Tends to be harder to spot dye, or whole room dyeing on location

TYPE 6

- Tends to be subject to fading from atmospheric contaminants like gas stoves and sunlight.
- Tends to dry slower because it is more absorbent than type 6,6.
- Tends to be more difficult to remove stains

Why is nylon different than other synthetic yarns?

NYLON VERSES OTHER SYNTHETIC YARNS

NYLON	POLYESTER, TRIEXTA, ACRILIC, OLEFIN
1. **May easily absorb stains** with food coloring (acid dyes, disperse dyes, turmeric dyes)	1. Naturally **resists** food coloring (acid dyes, disperse dyes, turmeric dyes)
2. **Requires protectants** to resist staining	2. **Requires no protectant** to resist staining
3. Generally **will not stain with oils**	3. **May permanently** stain with oils (***Oleophilic)***
4. **Absorbs water and water-based solutions**	4. Absorbs very little / no water-based solutions
5. **Tends to dry slow** (but faster than natural yarns	5. Tends to dry **fast**

To sum it up, clean nylon only as nylon, BUT clean polyester, olefin, triexta and acrylic as one, same yarn.

As you can see, it is very important and essential to be able to tell nylon from the other synthetic yarns. As far as identifying yarns, once you determine whether the yarn is synthetic, you only must determine if it is nylon or not. This is when you will find out why formic acid (fiber ID acid) is a carpet cleaners' best friend. Fiber identification is discussed in the next chapter.

- ✓ **Nylon = hydrophilic (water loving / *absorbent* to water)**
- ✓ **Polyester, Triexta, Acrylic & Olefin = hydrophobic (*resists* water / very little absorbency)**
- ✓ **Polyester, Triexta, Acrylic & Olefin = oleophilic (*absorbs* oils / may stain with petroleum oils**

MODULE 9 THE COMMERCIAL CHEMICAL BASICS

The Basic Cleaning Chemicals and Applications

1. Detergents

Detergents are a synthetically engineered product designed to emulsify (liquefy) soils. A detergent will not promote or cause rapid re-soiling if properly measured and applied. Normally, detergents may be left in carpeting to dry; not requiring neutralization or removal. The choices are:

A. Detergent alone – with or without a fragrance
B. Detergent with encapsulating properties. Encapsulating properties help carpet repel soils after the cleaning process is complete.
C. Detergent with acidic / fiber rinse (neutralizer) and acidic detergent
D. Detergents with enzymes

2. Encapsulates (helps prevent / slows down re-soiling)

A. Encapsulation Detergents – designed to use in a bonnet or shampoo type system. No rinse required.
B. Encapsulation Properties added to a detergent, or rinse agent, or BOTH

Note: encapsulation does NOT eliminate or replace the need for fluorochemical (teflon type) protection.

3. Traffic Land Cleaners / Traffic Lane Pre-Sprays (loosens soils before agitation and rinsing)

A. Majority are alkaline pH, some are acidic pH or neutral pH
B. Alkaline types: **Mild** = 7 to 8.5 pH **Medium** = 9 to 10.5 pH **Strong / Restorative** = 11 to 13 pH
C. Medium strength is the most popular; they often come in greater concentrates and save the most money. Be sure to look at the concentrate and coverage of each before you buy.
D. Acidic pH and neutral pH are for natural yarns and more delicate area rugs. Be sure to test the dyes on any area rug first! (not necessary on polypropylene /olefin and acrylics since they are always solution dyed)
E. Traffic Lane Cleaners may be offered with a deodorizer included

4. Traffic Lane Boosters (to greatly increase oily soils removal)

A. Does not raise or change the pH of the traffic lane cleaner you are using.
B. They are a great 'boost" to remove stubborn oily traffic soils from all synthetic yarns, especially polyester, triexta, acrylic and polypropylene/olefin.
C. Some brands may be used straight, without diluting for ink and other difficult oil-based stains
D. May be added to milder pH (7-8.5) to assist in dissolving oils, especially when yarns like wool are more pH sensitive.
E. Be sure to read directions well. These booster s are very concentrated. Usually, 1-2 ounces to each mixed gallon is enough to do the job. Be sure to rinse with a detergent, or a acidic rise/detergent combination product. This will help remove the oily film the booster lays behind for dissolving the oils.