ELECTRODRY GROUP

Carpet and Fibre Types

Electrodry Carpet Technician Training

Module 2

Natural Fibres

Wool

- Short Fibre
- Protein fibre
- Absorbs up to 80% of it in water
- May shrink if wet
- Very resilient
- Easily absorbs permanent dyes
- Smells when wet – often referred to as wet dog smell
  - This is caused by the sulphur reacting with moisture
  - This can be compounded by moisture in the carpet cleaning activating any mould/yeast present in the dirty wool carpet

Natural Fibres

Silk

- Mainly used in rugs
- Protein fibre
- Higher lustre
- Very absorbent
- Silk rug are often subject to dye migration
- Pile can be re-set/distorted through heat
- Affected high alkaline chemicals
- Great care is required when cleaning silk rugs
    - Silk rugs must be cleaned by hand and should not be attempted without appropriate training

Natural Fibres

Sisal

- Sisal is a naturally occurring fibre that is obtained from the three-foot leaves of the Agave plane
- Looks like rope matting
- Used as a durable face yarn
- Will shrink if wet
- Is sometimes dyed a red or green shade. The dye does not hold well and may come off with cleaning
- Many wool carpets are now made to look like a sisal weave and are generically referred to as a wool sisal carpets (tight high-low loop pile with a woven effect)

Man Made Fibres

Nylon

- Most common man made fibre
- Long yarn
- Absorbs up to 10% of its mass in moisture
- Very resilient
- Can be made thick or thin as desired and dyed to any colour
- Can be dyed with
- Acid Dyes – dye applied after manufacturer
- Solution dyed – dye is added to nylon solution before it is extruded into a fibre

The Nylon Generations

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

Man Made Fibres

6th Generation Nylon

- Has very good stain resistant properties (acid dye blocker and coatings similar to E-Gard)
- Often comes with a stain resistant warranty
- Stain repellence and dye blockers wear away with traffic and general use
- Any warranties on 6th generation carpets exclude stains created by products such as mustard (disperse dye), hot tea or coffee, blood, vomit, urine, faeces, bleaches, plant food, drain cleaners, non-food substances, non-beverage substances

Man Made Fibres

Solution Dyed Nylon

- Colourfast and won't fade as the colour is all the way through the fibre, not just applied to the outside of the fibre
- Comes with a stain resistant warranty but is not impervious to stains. The same fluro coatings (E-Gard type products) are used as is applied to 6th gen nylon carpet
- Warranties on solution dyed carpet are more comprehensive than for standard 6th gen nylon carpets, but will often include exclusions for stains such as acid dyes, juices, urine and caustics.

Man Made Fibres

Polypropylene (olefin)

- An extrusion dyed fibre - the dye is mixed into the plastic in the manufacturing process. This means there are no dye sites.
- Predominantly used for commercial carpet and thick rugs
- Low moisture absorbency (up to 2%)
- Resists bleaching and permanent dyes
- Fibres can be re-set with heat. Use of very hot pads can cause a “pad mark”
- Is oleophilic meaning it attracts oil, and lacks resilience. Tracking can be very hard to remove
    - Requires high pH cleaning products to break down oily soils to successfully cleantracked areas

Man Made Fibres

New type of polyester fibre

- Sometimes advertised as corn carpet as some versions (such as Smartstrand) are made with 30% corn/vegetable components
- Comes with a stain resistance warranty of up to 15 years depending on the brand. Very easy to clean.
- Soft luxurious feel
- Long term durability is still unknown

Man Made Fibres - Comparison

Performance Chart	Olefin PTT	Polyester	Nylon	Solution Dyed Nylon	Triexta Smartstrand Ultra
STAIN RESISTANCE	Topically Applied	Built In	Topically Applied	Built In Colorfast	Built In Permanent
STYLES AND AVAILABILITY	Moderate Commercial	Vast Selection	Vast Selection	Growing Selections	Very Vast Selection
SOFTNESS	Soft	Incredibly Soft	Incredibly Soft	Luxury Soft	Luxury Soft
STRENGTH & DURABILITY	Good	Great	Excellent	Exceptional	Exceptional
MOISTURE & SPILL RESISTANCE	Good	Excellent	Good	Great	Exceptional
PRICE	$-$$	$-$$$	$$-$$$	$$$-$$$$	$$-$$$$

Fibre ID Rub Test

- Using the tips of your fingers tips, strongly rub the fibre. The feeling you have on finger tips will indicate the fibre category. If the feeling is:

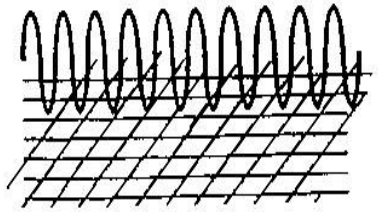
- Warm – Natural fibre
- Hot - Synthetic fibre
- Burning - Polypropylene/ Olefin

Fibre ID Burn Test. Insert table

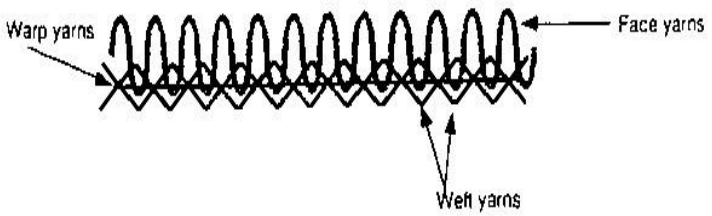
FIBER	FLAME	ODOR	ASH
NYLON	 Burns slowly while melting	Celery	Hard, tough bead
OLEFIN	 Burns with melting	Asphalt or Paraffin	Hard, tough tan bead
POLYESTER	 Sputters with melting	Sweet	Hard, tough black bead
WOOL	 Burns slowly and sputters	Burning hair	Easily crumbled black bead
RAYON	 Burns fast without melting	Burning paper	Almost none, like paper
ACRYLIC	 Burns fast, white-orange color	Charred meat	Irregular, hard crust

Carpet Style - Woven

- Woven' refers to a carpet or rug that is made through the process of weaving. The front and back of the woven carpet are formed at the same time
- Typical woven carpets are Wilton and Axminster

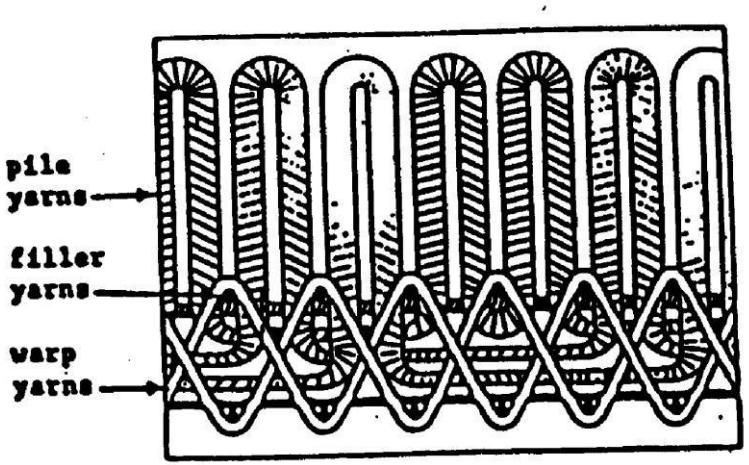


WOVEN CARPET

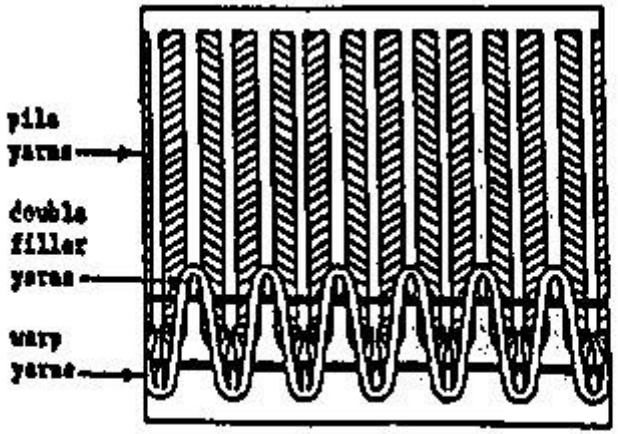


Carpet Style - Woven

- Wilton and Axminster carpets have a wool face yarn and cotton weft yearn (cross yarn)
- Long lasting
- Regularly used in hotels and clubs given it's wear-ability and fire rating



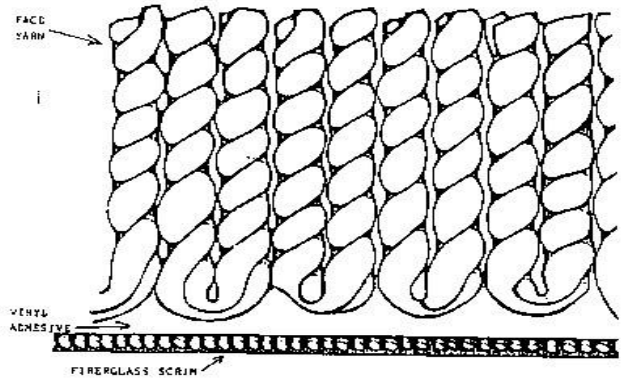
Wilton



Axminster

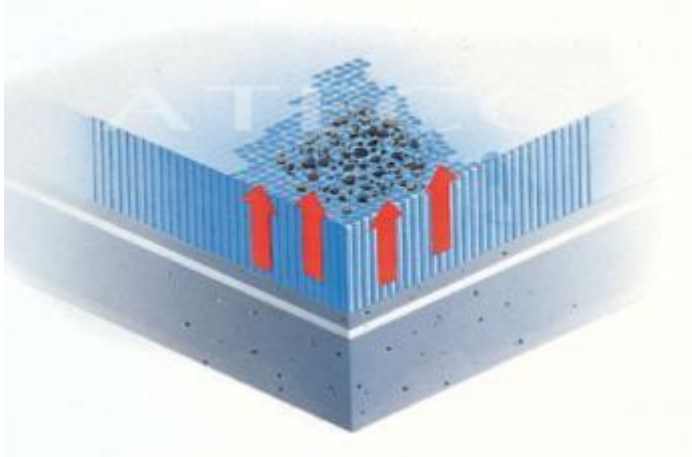
Carpet Styles – Fusion bonded

- Fusion bonded carpets are produced by implanting the face yarns directly into a liquid vinyl or rubber that also forms the backing
- It allows the yarns to more closely packed than in either weaving or tufting processes, resulting in extreme density of fibre
- Fusion bonded carpets can be either cut or looped pile
- Typically used for carpet tiles



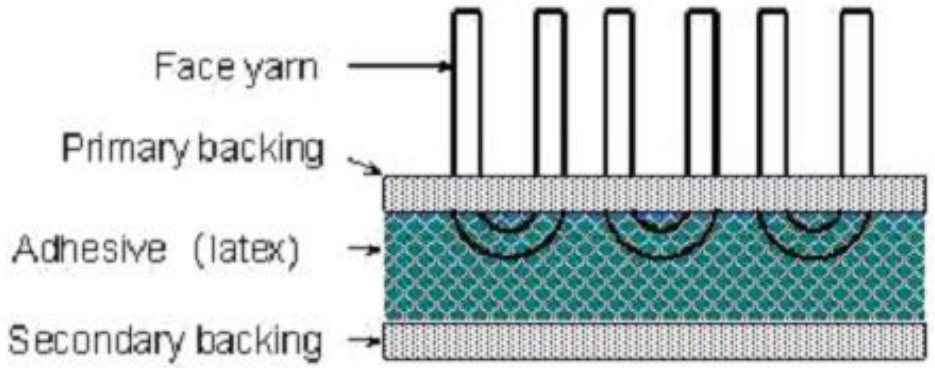
Carpet Styles – Flotex / Walkatex

- A fusion bonded carpet
- Short fibers are dropped onto a hot liquid which is cooled and sets to become the carpet backing
- Non-slip – large areas should be cleaned with hot water extraction
- Highly stain resistant



Carpet Styles – Tufted Carpet

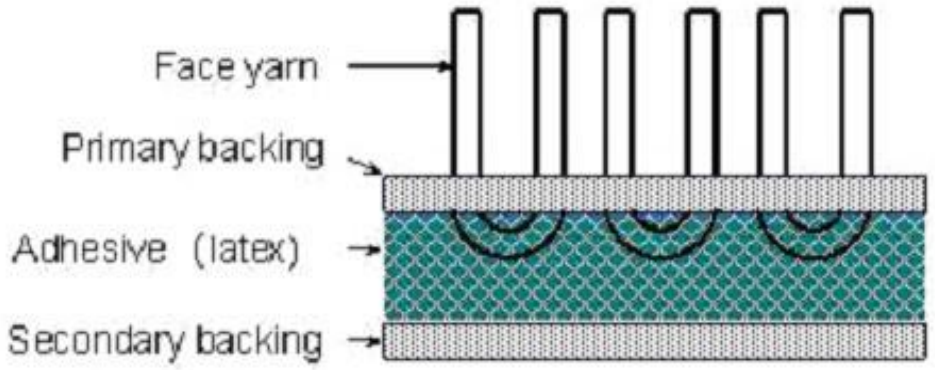
- Most carpets manufactured today are tufted carpets
- In production, yarns are stitched into a backing material to form loop-pile, cut-pile or cut and loop pile carpet
- Tufted carpet construction consists of face yarn and primary backing (usually polypropylene), adhesive (latex glue) and secondary backing (jute or polypropylene)



Carpet Styles – Tufted Carpet

•The production process is:

- The face yarn (usually wool, nylon or polypropylene) is sewn into primary backing (usually polypropylene)
- The primary backing is glued to a secondary backing using a latex glue. The secondary backing, usually either jute or polypropylene gives structural strength to the carpet

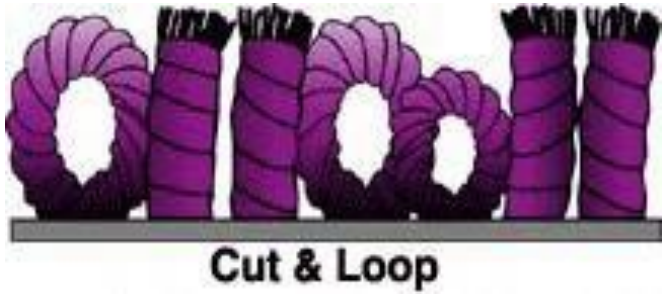


Carpet Styles – Tufted Carpet

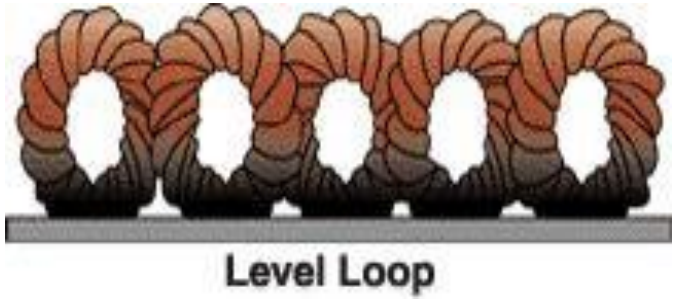
- ***Cut-Pile Design*** is where the face of the carpet is composed of individual, levelled cut pieces of yarn

- ***Loop-Pile Design*** refers to a carpet style where the pile surface consists of uncut loops. The loops can vary in height

- ***Cut and Loop Pile Designs*** refer to styles that include elements of both cut and loop pile design



Cut & Loop



Level Loop

Carpet Issues

Delamination

- When the primary and secondary backing separate. This usually occurs when the latex glue breaks down
- Results in ripple or wave effect in the carpet

Carpet Issues

Incorrectly Laid Carpet

- Some carpets are laid without sufficient tension. This is usually because they are laid with a knee kicker instead of a power stretcher.
- Over time, poorly laid carpet will stretch resulting in a wave or ripple. This usually occurs over the entire width of the room

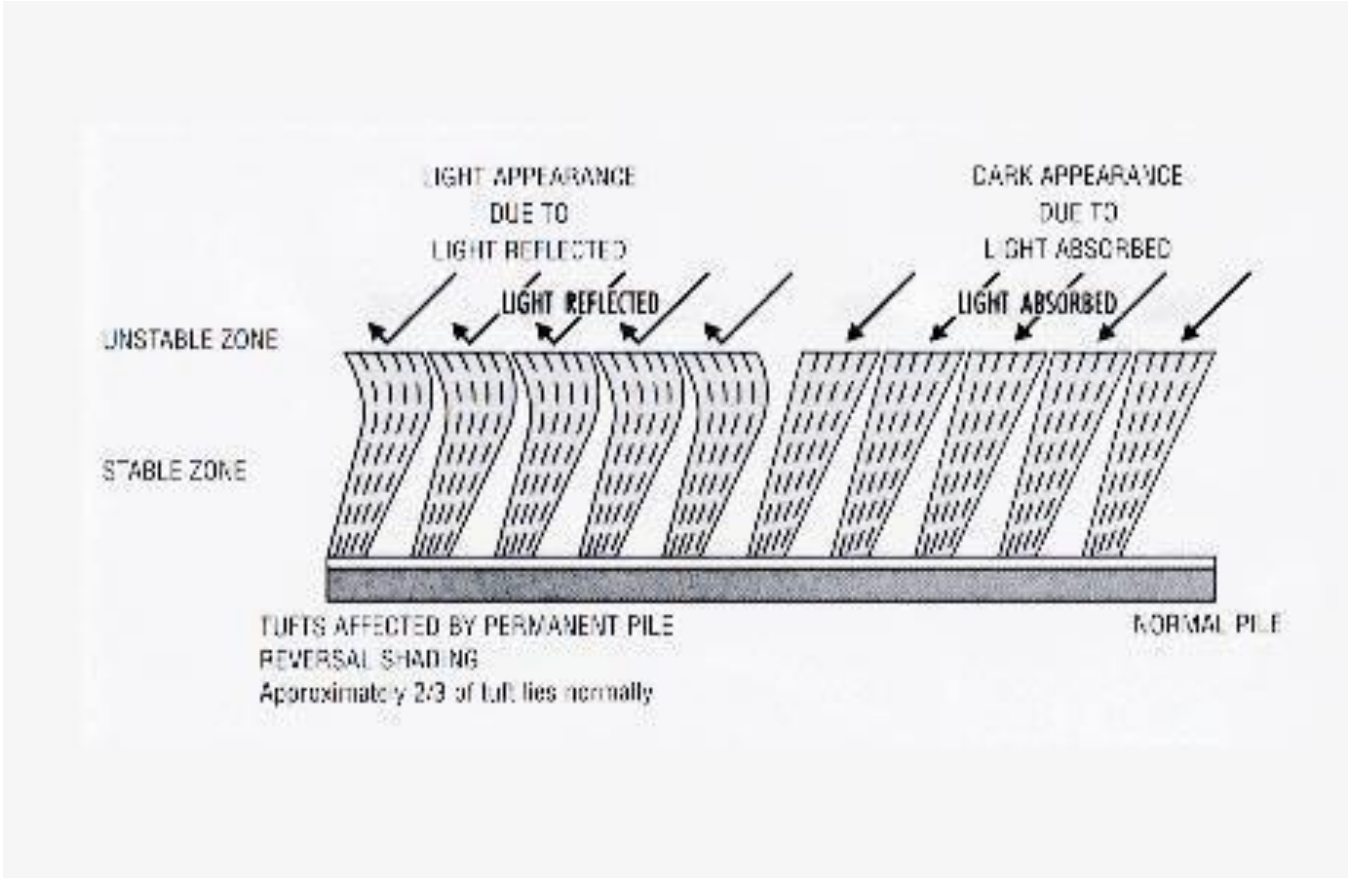
Carpet Issues

Pile Reversal/ Watermarking

- When carpet fibres lean in different directions
- Effect of pile reversal changes depending on the angle at which you look at the carpet

Carpet Issues

Pile Reversal



Carpet Issues

Abrasion/ Wear

- • Dull dark areas caused by scratching of the fibres from particular soils. Will appear to improve when carpet is wet
- When carpet is worn, the carpet fibres become rough and don’t reflect light resulting in a dark appearance in the carpet. Think gloss vs matt finish with paint
- Often accompanied by some permanent staining from soiling

photos required