



**“Service With Integrity”
Since 1968**

Professional Carpet & Upholstery Cleaning



Study GUIDE

The **National Carpet Cleaners Association** is the only independent UK trade body dedicated to the cleaning of carpets, hard flooring, upholstery, curtains and other soft furnishings. As such it is now nationally recognised by government, media, industry and commerce as the authoritative source of information and advice on all aspects of the industry.

Our two-day Professional Carpet & Upholstery Cleaning Course will teach you the basic knowledge needed to give you the foundations of a career path. We hope you enjoy the two days and will continue your development in the industry with the NCCA.

Passing the exam at the end of the course will make you eligible, (subject to our insurance requirements and other criteria), to become an Associate Member of the NCCA. As an Associate you will receive the support and guidance to help you become the professional that you intend to be, and progress to full membership of the Association.

This guide will give you a basic understanding of some of the more difficult areas of study on the course, along with an explanation of some of the technical terms used. Some of the terms and subjects may be difficult to comprehend but please do not worry, as these will be covered on the course and explained in more detail. Please make sure you bring the guide with you on the day.

As part of our course, you will also be supplied with the NCCA's comprehensive manual that will be yours to keep for future reference.

Welcome to the NCCA Training Programme.



Glyn Charnock
NCCA Director

Contents

Course Syllabus

Cleaning Principles and Methods

Chemistry of Cleaning

Fibres

Carpet Construction

Fabric Construction

Terms / Glossary

Course Syllabus

The Cleaning Survey

- *Why and how we do a full survey*
- *The equipment required*

Fibre Types and Identification

- *Classification of fibres*
- *Properties of fibres by type*
- *Identification methods*

Carpet Constructions

- *Woven, tufted, bonded*
- *Identification and cleaning issues*

Carpet Cleaning Demonstration

Fabric and Upholstery Constructions

- *Velvet, flat weave, tapestry, flock, stitch-bond*
- *Identification and cleaning issues*

Upholstery Cleaning Demonstration

The Chemistry of Cleaning

- *pH, cleaning agents, additives*
- *Cleaning principles - CHAT*

Basic Spot and Stain Removal

- *Principals and methods*

Health and Safety

- *Legislation and working practices*

Professional Standards

- *PAS86*
- *NCCA Code of Practice*

Cleaning Principles and Methods

Cleaning is the process of removing soil. Soil is defined as: “Any unwanted materials in the fabric / carpet”. Soil can be Insoluble, Water Soluble or Solvent Soluble.

Dry Soil Removal - Dry vacuum in two directions using an upright vacuum cleaner with a motor driven beater bar. Fabrics should be vacuum cleaned using tools designed for this purpose.

Soil Suspension - CHAT

- **Chemical Action** - separates soil from fibres, emulsifies oils.
- **Heat / Temperature** - increases cleaning product activity.
- **Agitation** - distributes products evenly and physically assists soil removal from fibres.
- **Time** - chemicals need dwell time to work effectively.

If one activity is decreased, at least one other must be increased to maintain the effectiveness of cleaning.

Soil Extraction - Removal of suspended soil by:

- **Wet Extraction / Hot Water Extraction (Steam Cleaning)** - Hot water is injected in to the carpet pile / fabric under pressure and removed using suction and airflow to extract the suspended soils.
- **Bonnet / Adsorbent Pad** - A bonnet or pad is passed over the carpet using a rotary machine lifting the soil in to the pad.
- **Rotary shampoo / Encapsulation / Dry Foam** - A low-foam or encapsulating detergent is applied to the carpet using a rotary brush machine. High foam products are used for Dry Foam cleaning, and only the foam is applied. Once dry, soil is extracted using a vacuum cleaner.
- **Dry Compound** - A carrier containing solvents and surfactants is spread over the carpet, worked in using a rotating cylindrical brush machine and allowed to dry. The carrier is then vacuumed out.

Setting the Pile (Nap) - The removal of marks following soil extraction, by brushing the pile in one direction, improves appearance and opens / lifts pile to assist drying.

Drying - Use of ventilation / air movers / heating system to reduce drying times.

Chemistry of Cleaning

pH - Potential for Hydrogen.

Water, H_2O , can separate in to Hydrogen Ions (H^+) and Hydroxyl Ions (OH^-). pH measures the levels of H^+ . Only water based solutions have a pH. Solvent based solutions such as dry cleaning products have no pH value.

The pH scale measures how acidic or alkaline a substance is. The scale ranges from 0 to 14. In pure water, the number of H^+ and OH^- ions is equal, this is pH 7, which is neutral - neither acidic or alkaline.

When chemicals are mixed with water, the mixture can become either acidic or alkaline. If there are more H^+ ions than OH^- ions, the pH is less than 7 and the solution is acidic. The more H^+ ions present, the lower the pH. If there are more OH^- ions than H^+ ions, the pH is more than 7 and the solution is alkaline.

Acidic and alkaline are two opposites that describe a chemical's properties. Mixing acids and alkalis can cancel out or neutralise each other. A substance that is neither acidic nor alkaline is neutral.

The pH scale is logarithmic and as a result, each whole pH value below 7 is ten times more acidic than the next higher value. For example, pH 4 is ten times more acidic than pH 5 and 100 times (10 times 10) more acidic than pH 6. The same holds true for pH values above 7, each of which is ten times more alkaline than the next lower whole value. For example, pH 10 is ten times more alkaline than pH 9 and 100 times (10 times 10) more alkaline than pH 8.

Fibres

Fibres are made up of thin filaments. Filaments can be *continuous* (one long strand) or *staple* (short lengths). Fibres are *spun* (twisted together) to form yarn. Synthetic fibres are made by *extrusion* (forcing liquid polymer through small holes to form filaments).

Fibres can be classified as *natural* or *synthetic*.

Natural

- **Protein fibres** - eg. Wool, Silk.
- **Cellulosic fibres** (from plants) - eg. Cotton, Linen, Jute, Sisal.

Synthetic

- Nylon, Polyester, Acrylic, Polypropylene (Olefin).
- Viscose / Rayon (synthetic cellulosic fibre).

Fibre Facts

- **Wool** - Dissolves in chlorine bleach, absorbs water readily, damaged by alkalis and enzymes.
- **Silk** - Damaged by acids, bleaches, alkalis and enzymes, the only natural continuous fibre, very absorbent.
- **Cotton/Linen** - Acids rot fibres, resistant to alkalis, stronger when wet, susceptible to shrinkage and cellulosic browning.
- **Jute** - Swells and rots when wet, used as weft fibres in some woven carpets, subject to cellulosic browning.
- **Viscose (Rayon)** - Synthetic cellulosic fibre, susceptible to mildew, strong alkalis cause loss of strength, water sensitive.
- **Nylon** - Strong fibres resist abrasion, alkali resistant, weakened by UV light.
- **Polyester** - Strong fibres resist abrasion, absorbs oil and grease, UV resistant, not absorbent, alkali resistant.
- **Acrylic** - Resembles wool, resists alkalis, acids, bleaches and solvents, flammable, very UV resistant.
- **Olefin (Polypropylene)** - Solution dyed, stain resistant, will not shrink, low melting point, absorbs oil, floats.

The Burn Test - A small sample of fibre is introduced to a flame. How it reacts and the resulting ash will indicate the type of fibre.

Dyeing Methods

- **Solution Dyeing** - Pigment added to liquid polymer before extrusion.
- **Stock Dyeing** - Filaments are dyed before being spun in to yarn.
- **Yarn Dyeing** - Yarn is dyed by immersion in a vat of pigment.
- **Piece Dyeing** - Part finished carpet or fabric is soaked in dye.
- **Printing** - Similar to an ink jet printer, dye is sprayed on to carpet or fabric to form a pattern.

Croaking - Dye transfer due to physical action (can be wet or dry).

Carpet Construction

Woven - Made on a loom. A Jacquard loom produces Axminster carpet; a Wilton loom produces Wilton carpet. Warp fibres run the length of the carpet, weft fibres run across the width of the carpet. Face or pile fibres make up the surface of the carpet and are held in place by the warp and weft. Stuffers and fillers are extra fibres which may be used to create bulk or stiffness in the carpet. All these elements are brought together in a single process on the loom.

Tufted - The face or pile fibres are pushed through a primary backing (scrim) by needles. A latex adhesive is used to hold the tufts in place and a secondary backing is applied to stiffen the carpet.

Bonded - Pile fibres are glued to a primary backing and a second backing is added for stability.

Face fibres can be a loop pile, a cut pile or mixture of both cut and loop (sculptured).

Fabric Construction

- **Plain weave** - A flat fabric used for print dyeing or other effects.
- **Flatweave** - Made on a Jacquard loom giving pattern to the weave.
- **Velour / Velvet** - Fabric with a pile face which can vary in length.
- **Jacquard** - Multi warp and weft weave eg tapestry, damask.
- **Stitch-bond / Quilt** - Two or more layers of fabric stitched together during the weaving process.
- **Chenille** - Using crimped novelty fibre to give a pile like finish.
- **Bonded / Flock** - Short pile glued to a backing fabric. Solvents should not be used

Fabric construction is not related to fibre type. For example, velvet may have a cotton, viscose, acrylic, polyester or nylon face fibre, or even a blend of two or more of these fibre types

Microfibre - Extremely fine filaments made using a mixture of nylon and polyester. Extremely absorbent, these fibres will retain moisture from the cleaning process and dry very slowly. May be used in flock fabrics.

Terms / Glossary

BLEACHING - The removal of colour by an oxidising or reducing agent.

BRIGHTENERS - Optical whitening agents which emit a bluish colour under UV light.

BROWNING - A yellow / brown discolouration of cellulosic (plant based) fibres such as cotton or linen. Usually associated with over wetting or residues of high pH products following cleaning.

CATALYST - A substance which speeds up a chemical reaction.

CELLULOSE - A complex carbohydrate molecule which forms the basic framework of plant cells.

DEFOAMER - A product used to prevent the formation of foam, usually silicone based.

DELAMINATION - The separation of the primary and secondary backings of a tufted carpet.

DETERGENT - A substance capable of dislodging or emulsifying solids, a general term for products containing surfactants, builders, solvents etc.

EMULSIFIER - A chemical which aids the suspension of one liquid within another.

ENCAPSULATION - A process by which some cleaning products surround soil particles, preventing their re-attachment to the fibres following suspension.

FLOUROCARBON - Fabric protector which resists both oil and water based stains.

HYDROPHILIC - "Water loving" - the part of a detergent molecule which has an affinity for water.

HYDROPHOBIC - "Water hating" - the part of a detergent molecule which has an affinity for oils.

MICROSPLITTER - Detergent free cleaning agent based on Sodium Tripolyphosphate (STPP).

OXIDISING AGENT - A chemical capable of removing or changing colours by adding an oxygen atom to the dye substance - eg. Hydrogen Peroxide.

PATHOGEN - An infective agent which can cause disease including bacteria viruses and fungi.

PEROXIDE - An oxidising agent used for bleaching processes, typically Hydrogen Peroxide.

POLYMER - High molecular weight compound formed by linking large numbers of smaller units (monomers) in to chains. Polymers used in fibre production include Nylon, Acrylic, Polyester, Polypropylene, etc. Commonly called plastic.

REDUCING AGENT - A chemical capable of removing or changing colours by removing an Oxygen atom from the dye substance - eg. Sodium Hydrobisulphite.

SURFACE TENSION - Molecular forces at the surface of a liquid which cause it to form a bead rather than spread as a film.

SURFACTANT - A Surface Active Agent, used to reduce surface tension, enhance wetting and aid emulsification.

SUSPENSION - A mixture of two liquids which would not normally mix (eg. oil and water) by the formation of droplets of one liquid held within the other.

TAMPING - A method of agitating products into fibres without causing damage.

VOLATILE - A compound which evaporates or vaporises completely at ordinary temperatures on exposure to the air.

WETTING AGENT - A compound which reduces surface tension of a liquid.

We hope you enjoy the course, good luck with the exam.

NOTES

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