IICRC S300
Standard for Professional Upholstery Cleaning

Public Review Copy

Important Definitions

Throughout this document, the terms "*shall*," "*should*," and "recommend" are used to compare and contrast the different levels of importance attached to certain practices and procedures. *Should* and *Shall* have been italicized to illustrate the specific definition throughout this document.

***shall*:** When the term *shall* is used in this document, it means that the practice or procedure is mandatory due to natural law or regulatory requirements, including occupational, public health, and other relevant laws, rules, or regulations, and is therefore a component of the accepted "standard of care" to be followed. **To further indicate when this term is used in this document, that it carries this specific definition, it has been italicized**.

***should*:** When the term *should* is used in this document, it means that the practice or procedure is a component of the accepted "standard of care" to be followed, while not necessarily mandatory by regulatory requirements. **To further indicate when this term is used in this document, that it carries this specific definition, it has been italicized**.

recommend(ed): When the term *recommend(ed)* is used in this document, it means that the practice or procedure is advised or suggested but is not a component of the accepted “standard of care” to be followed.

In addition, the terms “may” and “can” are also available to describe referenced practices or procedures, and are defined as follows:

may: When the term *may* is used in this document, it signifies permission expressed by the document, and means that a referenced practice or procedure is permissible within the limits of this document, but is not a component of the accepted “standard of care” to be followed.

can: When the term *can* is used in this document, it signifies an ability or possibility open to a user of the document, and it means that a referenced practice or procedure is possible or capable of application but is not a component of the accepted “standard of care” to be followed.

For the practical purposes of this document, it was deemed appropriate to highlight and distinguish the critical remediation methods and procedures from the less critical, by characterizing the former as the perceived and recommended “standard of care.” The IICRC S300 Consensus Body interprets the “standard of care” to be: Practices that are common to reasonably prudent members of the trade who are recognized in the industry as qualified and competent. Notwithstanding the foregoing, this Standard is not intended to be either exhaustive or inclusive of all pertinent requirements, methods or procedures that might be appropriate on a particular upholstery cleaning project.

A Scope, Purpose and Application

A1 Scope

This standard describes the systems, methods, and procedures to be followed when performing professional upholstery cleaning.

This Standard does not specifically address the processes and procedures for restoring or remediating smoke or microbially contaminated upholstery. Refer to the latest editions of *ANSI/IICRC S700 Standard for Professional Fire and Smoke Damage Restoration* and *ANSI/IICRC S520 Standard for Professional Mold Remediation* for more information.

A.2 Purpose

The purpose of this standard is to define criteria and methods to be used for evaluating upholstery characteristics and conditions and to establish cleaning procedures.

Every upholstery cleaning situation has unique characteristics, and each project *should* be carefully evaluated to determine the proper application of this Standard. In extenuating circumstances, deviation from portions of this Standard may be appropriate. Carelessness is not acceptable, and common sense *should* prevail in all cases.

A3 Application

This standard was created primarily for use by professional cleaners, and secondarily for other Materially Interested Parties (MIPs) (e.g., upholstery fabric and furniture manufacturers, industry suppliers, retailers, and distributors).

This document provides procedural standards for professional upholstery cleaning. It was not written to teach comprehensive upholstery cleaning procedures. Numerous books, manuals, videos, workshops, and seminars are available to teach comprehensive upholstery cleaning procedures.

IICRC S300 Standard for Professional Upholstery Cleaning does not include performance characteristics or standards for manufacturing or upholstering furnishings.

B Definitions

Certain terms and definitions associated with upholstery cleaning exist. The following are definitions of terms used in this standard.

Absorbent: a material that draws liquid or gaseous substances into itself, usually from surfaces or from the air. Typically, there is a physical change in the material used as the absorbent (e.g., cotton towel).

Adsorbent: a material capable of attracting liquids or gaseous substances to its surface. Typically, there is no chemical or physical change in the material used as the adsorbent (e.g., microfiber towel).

Agitation: the movement of one or more components by physical or mechanical means to loosen soil and other particles.

AHJ: Authorities Having Jurisdiction.

Aniline leather: full grain leather colored with nontoxic aniline dye, rather than pigments or other opaque materials.

Bleeding (colorfastness) test: a test performed by the cleaner to determine if the proposed cleaning procedures will release fugitive dyes causing color bleeding of the fabric.

Bleeding: the migration or transfer of dyes within or from a wet fabric.

Browning (commonly called cellulosic browning)**:** a yellow, red, or brownish discoloration produced when the lignin in cellulosic or regenerated fibers is released in the presence of moisture (e.g., minimally processed cotton, linen, viscose, rayon). It is caused by over-wetting or water damage, highly alkaline solutions, and prolonged drying.

Cellulosic browning: see browning.

CHAT (Chemical activity, Heat, Agitation, Time**):** acronym for the principles of soil suspension.

Chemical activity: is a measure of the effective concentration of a species in a solution.

Cleaner: see professional cleaner.

Cleaning: the process of removing unwanted substances from an environment or material and reducing the risk of damage to the surface or substrate or causing harm to human health.

Colorfastness: the ability of a fiber or fabric to retain its color despite exposure to ultraviolet light, wet crocking, dry crocking, cleaning, or atmospheric contaminants within accepted standards.

Crocking: term used to describe the wet or dry transfer of excess dye through agitation or rubbing.

Crocking test: a test performed by the cleaner to determine if the proposed cleaning procedures will cause wet or dry transfer of excess dye through agitation or rubbing of the fabric.

Distortion: any of several alterations in the appearance of a textile surface.

Distortion test: a test performed by the cleaner to determine if the proposed cleaning procedures will cause distortion of the fabric.

Dry solvent: a non-water liquid (hydrocarbon) that has the ability to dissolve oils, greases, etc.

Durable and non-durable weaves: the degree to which a material can or cannot withstand usage.

Dwell time: the time given for cleaning agents to remain in contact with the fabric as part of soil suspension.

Dye: a soluble, color absorbing/reflecting material. Dyes differ in their resistance to sunlight, perspiration, cleaning agents, and atmospheric gases; their solubility; their affinity for differing fibers; and their method of application.

Dye testing: see bleeding test and crocking test.

Emulsify: is the process of mixing two immiscible phases (e.g., oil and water) with the aid of a surface-active agent (emulsifier) into homogeneous dispersion or emulsion.

Fabric: in the broadest sense, any woven, knitted, plaited, braided, felted, tufted, or non-woven material made of fibers, threads or yarns.

Felting: a fabric type or fabric effect that is produced by agitating wet wool, in or after being in an alkaline solution.

Fiber: a generic term for any natural or synthetic strand or filament that is strong enough to be used in thread or yarn in the manufacture of a textile product. Important properties of fibers include elasticity, fineness, uniformity, durability, soil resistance, and luster.

Filament: a single strand of natural or synthetic fiber. Natural fiber filaments are spun into yarns, and synthetic filaments may be extruded directly into yarn form.

Grooming: the process of nap setting following cleaning and after treatment (e.g., fabric protector application).

Hand: the feel and texture of the fabric.

Heat: energy that causes molecules to be in motion, raises the temperature of a substance, and flows from one object to another as a result of a difference in temperature between those two objects.

Hot Water Extraction (HWE): a term used to describe a textile cleaning process that uses a heated water solution, primarily as a rinsing agent, applied under water pressure, and subsequently vacuumed by the same machine to carry off dissolved or suspended solids and detergent residues. Also known as water rinse extraction.

Hydrogen Dioxide: is called water. Hydrogen dioxide is not a commonly used name for water, and it can be misleading since the chemical formula H2O suggests two atoms of hydrogen and one atom of oxygen, while the name hydrogen dioxide might suggest the presence of two atoms of oxygen.

Hydrogen Peroxide (H_2O_2): a colorless, viscous, unstable liquid with strong oxidizing properties. Commonly used in diluted form as a disinfectant and bleaching agent.

Insoluble: not capable of being dissolved in a liquid.

Inspection: see pre-cleaning inspection and post-cleaning inspections.

Interim/periodic cleaning: the process of thorough cleaning using one or more of the cleaning methods described in this standard. Interim/periodic cleaning can help to delay or prevent permanent damage to fibers, dyes, or fabric texture.

Internal inspection: potential problems and other useful information (e.g., water stains on pillows, upholsters marks, fire retardants, and manufacturers stickers) may be found by opening zippers on cushions or pillows, although inspection of all areas may not be possible.

Latent damage: Damage not yet apparent but which may occur at a subsequent time (e.g., inherent fragility, brittleness, or instability).

Latex sponge: primary structural component of the cushion, often wrapped in layers of other materials.

Lofted: the act of fluffing a pile fabric.

Make up air: fresh air that is introduced to an environment that is being ventilated.

Neutralize: to render a substance or its qualities inactive by applying an opposite force or effect.

Normal (standard) cleaning: refer to the definition of interim/periodic cleaning.

Nubuck aniline leather: top-grain aniline-dyed leather from which the top hair cell layer has been removed through buffing to create a “suede-like” nap effect.

pH-neutral (ranges 6-8): pH neutral is technically a pH of 7.0, however, the cleaning industry considers a neutral cleaner to be a product with a pH of between 6.0 and 8.0.

Pigment: A white or highly colored insoluble substance that is used to impart color to other materials.

Pile (face pile, nap): the surface of a textile comprised of fibers, threads, or yarns extending above the foundation or backing.

Pile fabric: fabric in which threads or yarns project from a foundation and form a cut or uncut (loop) effect on the surface.

Post-cleaning inspection: the process of evaluating the condition or outcome of upholstered furniture after cleaning.

Pre-cleaning inspection: the process of obtaining information needed to evaluate the condition of upholstered furniture prior to cleaning attempts. This information will help the cleaner determine the risk potential, preferred cleaning method, and create awareness of any issues that may arise during the cleaning process.

Professional cleaner: one who applies specialized knowledge about upholstery components and construction, soiling (e.g., types, sources, distribution), cleaning agents and how they function, cleaning and spotting principles, and the methodology for removing maximum soil with minimum harm to the textile (e.g., dyes and textures), end-users, and the environment.

Restorative cleaning: restorative cleaning goes beyond interim/periodic cleaning processes and is typically performed by a professional cleaner specially trained or skilled in restorative cleaning procedures using more aggressive techniques and cleaning agents.

Routine maintenance: maintenance that is performed daily, weekly, or at regular intervals and can consist of various cleaning techniques, including vacuuming, and light spot cleaning. Maintenance helps to keep the furnishings in a more attractive and healthy state while preventing premature wear. Lack of routine maintenance could result in a premature need for restorative cleaning.

Salvage cleaning: use of "heroic" effort to clean a textile that is soiled (and possibly stained) beyond a technician's ability to restore it using safe, industry accepted techniques.

Shrink test: a test performed by the cleaner to determine if the proposed cleaning procedures will cause shrinkage of the fabric.

Shrinking: a reduction in width, length, or overall size due to the introduction of moisture to a textile.

Sodium perborate: an oxidizing bleach that generates hydrogen peroxide when mixed with water and is used for minimal-risk oxidation (removal) of stains.

Sodium percarbonate: an oxidizing bleach that generates hydrogen peroxide when mixed with water and is used for minimal-risk oxidation (removal) of stains.

Soil suspension: the use of chemical action, heat or temperature, agitation, and time to separate soils from fibers and materials so that those soils may be more readily removed or extracted.

Soil: any undesired substance that is deposited on, or that is foreign to, the construction of a textile material. Soil results from environmental conditions and use (e.g., dust and particles, shed fibers, foods, and oily substances).

Speed drying: focused efforts to expedite the drying of the fabric using techniques including but not limited to, increasing airflow, reducing humidity, and increasing ambient temperature.

Spills: wet, dry, oily, or a combination of substances that are accidentally deposited on a textile.

Spots: are defined as foreign material on the surface of a fiber, changing the hand of the fabric (e.g., sticky, oily, greasy, stiff). Spots usually can be removed, and some can become stains.

Stains: the result of a substance adding color to a fabric or surface. Stains are frequently permanent and may remain after cleaning attempts. The term “stains” are often applied to discolorations or color loss from textiles.

Thread: (noun) a specialized plied yarn used for sewing, basting, and embroidery. Threads are made from yarn, but yarns are not made from threads.

Time: See “dwell time.”

Upholstery: a textile furniture covering (e.g., fabric or leather). This definition may be extended to include, office dividers, wall coverings, and similar textile-covered items.

Weave (upholstery): a fabric manufacturing technique in which warp, weft (picks or fillers), and sometimes pile yarns are interlaced to form fabrics and patterns.

Wick back: soil being deposited on the surface of textile through the action of wicking.

Wicking: the migration of liquids within textiles or porous materials to the surface, by capillary action.

Yarn: a continuous strand composed of twisted natural or synthetic fibers or filaments, which serves as one of the basic raw materials of textiles.

1 Fiber, Construction, and Styles

Upholstery Fiber Cleaning Characteristics

Upholstery fabrics are manufactured using many different fibers or combinations of fibers. These fibers are constructed using different methods to create varying types of fabrics. These fabrics are applied to an upholstery frame using different methods to create styles of upholstered items. To successfully clean these fabrics, the professional cleaner *should* be able to identify fibers and fabrics, as well as understand their cleaning characteristics.

1.1 Natural Fibers

Natural fibers are derived from plants, animals, or minerals. They fall into three subcategories: cellulose, regenerated/modified cellulose, and protein. Mineral fibers are not covered by this Standard.

1.1.1 Cellulose Fibers

Cellulosic fibers are derived from plants. The two most common cellulosic fibers found in upholstery are cotton and linen.

1.1.1.1 Cotton

Cotton is a soft, absorbent fiber composed of 90 to 96% cellulose, commonly white or brownish white in its natural state. Cotton grows from the seed pod of the cotton plant and is found in lengths of 0.5 to 2.5 inches. Cotton can retain 20% of its weight in moisture. Cotton accepts a variety of dye types and can be extremely colorfast. For this reason, cotton lends itself well to contact-dying processes, such as printing. Cotton is easily contact dyed by many staining materials, especially those containing acid dyes.

Cotton withstands high water temperatures, but caution *should* be exercised because of its absorbent nature. Rapid drying is key to proper cleaning without problems. Cotton may be damaged or dissolved by concentrated mineral acids.

Concentrated volatile organic acids (e.g., acetic or formic acid) do not affect cotton; however, nonvolatile organic acids (e.g., oxalic or citric acid) weaken the fiber (especially if they are hot) if not properly neutralized with appropriate alkaline agents.

Cotton easily withstands weak alkalis. Hydrogen peroxide (3%) and sodium perborate do not harm cotton if properly controlled. Reducing agents, such as sodium bisulfate or sodium hydrosulfite, have little effect on the fiber itself, but dyes may be affected.

The professional cleaner *should* always test in an inconspicuous area of the fabric before using corrosive, oxidizing, or reducing agents.

1.1.1.2 Linen

Linen is a fine, soft, silky, somewhat brittle vegetable fiber produced from the stem of the flax plant, commonly gray, brown, or tan in its natural state. Linen undergoes a comprehensive manufacturing process before it becomes a finished fabric.

Linen withstands high water temperatures and is stronger and more lustrous than cotton. Linen yields cool, absorbent fabrics that wrinkle easily. Its ability to absorb moisture and then release it quickly makes it easy to clean. Concentrated mineral acids such as hydrofluoric acid damage linen. Some formulated products may be used but *should* be properly neutralized and rinsed. Concentrated volatile organic acids, such as acetic acid, do not adversely affect linen. However, non-volatile organic acids, such as oxalic or citric, weaken the fiber (especially if hot), if not properly neutralized.

The older the linen fabric, the more likely it is to brown while drying. Dyes used on linen may not withstand high alkalinity without color loss. Hydrogen peroxide (3% or 10 volume) and sodium perborate do not damage linen and are less likely to harm dyes if properly controlled. Diluting reducing agents, such as sodium bisulfite or sodium hydrosulfite, have little effect on the fiber itself, although dyes may be affected. The professional cleaner *should* always test in an inconspicuous area of the fabric before using corrosive, oxidizing, or reducing agents.

Linen is more brittle than cotton. The professional cleaner *should* carefully inspect the fabric for any signs of abrasion, particularly in heavy-use areas such as cushions, armrests, headrests, and on piping. The cleaner *should* carefully employ agitation during cleaning to avoid fiber and dye damage.

1.1.2 Regenerated/Modified Cellulose (Manmade, Semi-synthetic) Fibers

Regenerated or modified cellulose fibers begin as a combination of chemicals and liquefied cellulosic components, extruded through a spinneret, and then hardened in liquid or air to form a manmade filament or fiber. This classification of fibers includes rayon, viscose, and acetate. Rayon, viscose, “art silk” (i.e., artificial silk), bamboo silk, and other artificial silks are similar and *should* be approached similarly by the professional cleaner.

1.1.2.1 Rayon

Rayon, like cotton, absorbs about 20% of its weight in moisture, but it is more resistant to sunlight and microorganisms than cotton. It is not very elastic and does not regain its shape or size when stretched aggressively.

Agitation and moisture *should* be minimized during the cleaning process because rayon loses up to 70% of its strength when wet. Rayon fabric has a high probability of shrinking, so the professional cleaner *should* conduct field tests to identify textiles that may shrink. Rayon pile velvets can be extremely sensitive and *should* be groomed as the cleaning process progresses. For best results, each section *should* be groomed immediately after cleaning.

Rayon is sensitive to heat, and cleaning solution temperatures *should* be lukewarm or cooler. Rayon is attacked by mineral acids, although it is not affected by concentrated volatile organic acids, such as acetic acid. However, non-volatile organic acids, like oxalic or citric acid, adversely affect the fiber, especially if hot and not adequately neutralized. Rayon withstands weak alkalis. Use strong alkalis only when they are cool. Hydrogen peroxide (3%) or sodium perborate do not damage rayon if properly used and neutralized. Reducing agents, such as sodium bisulfite or sodium hydrosulfite, have little effect on the fiber itself.

The professional cleaner *should* always test in an inconspicuous area of the fabric before using corrosive, oxidizing, or reducing agents.

1.1.2.2 Acetate

Acetate is a derivative of cellulose. Acetate fibers resist wrinkling, stretching, and shrinkage. The professional cleaner *should* be aware that acetate fibers lose some strength when wet, though not as much as rayon. Acetate does not deteriorate from salt (in perspiration) or microorganism exposure.

Acetate has poor abrasion resistance, is heat sensitive, and is weakened by prolonged exposure to sunlight. Acetate fibers dissolve in acetone, alcohol, or glacial acetic acid. Even nail polish or acetone-based nail polish remover or perfume can dissolve or degrade the fiber. Mild solutions of hydrogen peroxide (3%) may be used. Caution *should* be used when testing acetate since strong solutions of alkalis or acids damage it over time.

1.1.3 Protein Fibers

Protein fibers are produced by animals or insects. In general, protein fibers are fibers of moderate strength, resiliency, and elasticity. Protein fibers have excellent moisture absorbency and soil release characteristics. Protein fibers resist static charges. Some examples of protein fibers include wool, silk, mohair, and cashmere. The two most common protein fibers found in upholstery fabrics are wool and silk.

1.1.3.1 Wool

Wool is a term used primarily to designate sheep hair. It consists of approximately 50% carbon, 23% oxygen, 16% nitrogen, and 4% sulfur. Wool is an opaque (i.e., non-transparent), tri-component fiber consisting of the epidermis, cortex, and medulla.

Wool is flexible, elastic, strong, and resilient due to its natural crimp. Wool absorbs up to 30% of its weight in moisture before feeling damp to the touch. The professional cleaner *should* understand that once placed in use, wool is easily stained. Due to wools absorbency, stains can be deeply embedded and difficult to remove. Wool is somewhat weaker and swells in the presence of moisture. Agitation *should* be kept to a minimum due to its tendency to felt. It is recommended that cleaners use products that are formulated for use on wool. Cleaners *should* avoid products with high alkalinity. High alkalinity damages the cuticle of the wool fiber and may cause dyes to bleed.

Wool is naturally flame resistant, although it degrades when exposed to high temperatures for extended periods. As with any protein fiber, the use of any chlorine bleach (i.e., sodium hypochlorite) *should* be avoided as it dissolves wool.

Specialized or restorative spotting treatments may require the use of diluted reducing agents (e.g., sodium bisulfite or hydrosulfite) or oxidizing agents. If used, the least damaging oxidizer for wool is hydrogen peroxide, which *should* be of a minimal concentration (e.g., 3% or lower). Before using reducers or oxidizers, careful testing *should* be performed in an inconspicuous area of the fabric to ensure that neither dye nor fiber is adversely affected.

On completion of the cleaning or spotting service, the professional cleaner *should* leave the wool fiber in an acidic state to ensure that all alkaline residues have been neutralized and will protect the wool fiber from degradation.

1.1.3.2 Silk

Silk fiber is obtained by unreeling the cocoons of silkworms. Silk is a bicomponent fiber consisting of two strands of fibroin (80%), which are adhered with sericin or silk gum (20%). Silk is among the strongest, most elastic, consistently lustrous, and expensive textile fibers. It has the ability to stretch as much as 20%. If farmed, silk may come in a continuous filament form.

Silk is a highly absorbent fiber and accepts dye easily. As a result, silk is susceptible to staining, including water staining. The professional cleaner *should* use distilled water when performing spot and stain removal to reduce the risk of this occurring. Silk can withstand high temperatures, but it yellows in the presence of high alkalinity. It becomes brittle with extended exposure to sunlight, high alkalinity, or acid soils (e.g., perspiration and body oils). Cleaners *should* use caution when working on heavy-use areas or spots on silk fabric during cleaning.

Specialized or restorative spotting treatments may require the use of diluted reducing agents (sodium bisulfite or hydrosulfite) or oxidizing agents. If used, the least damaging oxidizer for silk is hydrogen peroxide, which *should* be of a minimal concentration (e.g., 3% or lower). Before using reducers or oxidizers, careful testing *should* be performed in an inconspicuous area of the fabric to ensure that neither dye nor fiber is adversely affected.

1.2 Synthetic Fibers

Synthetic fibers are different from modified or regenerated cellulosic or semi-synthetic fibers by virtue of the raw materials from which they are made. The four synthetic fibers encountered in upholstery fabrics are made with products derived from coal, natural gas, or petroleum. They include nylon, polyester, acrylic, and olefin (polypropylene).

1.2.1 Nylon (Polyamide)

Nylon is a polyamide formed from hydrogen, nitrogen, oxygen, and carbon. Nylon is light and strong. These characteristics do not diminish with age. Therefore, nylon is abrasion resistant. It can be stretched up to 33% of its length and still return to its original configuration. These characteristics make nylon easy to clean, regardless of the type of weave. The Professional cleaner *should* be aware that nylon is easily contact dyed by substances such as colored beverages (e.g., red wine, fruit punch, and grape juice).

Nylon is heat resistant and not affected by alkalis that may be present in pre-conditioners or rinse agents. Nylon is dissolved by formic acid. Before using reducers or oxidizers, careful testing *should* be performed in an inconspicuous area of the fabric to ensure that neither dye nor fiber is adversely affected.

1.2.2 Polyester

Polyester is a strong, abrasion and UV resistant (i.e., sun fading) fiber. It is not prone to stretching and is dimensionally stable. Polyester responds well to cleaning and spotting efforts. The fiber is hydrophobic, absorbs little moisture and dries quickly. The professional cleaner *should* control the volume of solutions applied to the surface to avoid runoff.

These fibers are difficult to stain, adsorbent, and oleophilic*,* resulting in attraction of oily soils (e.g., body oils, sunscreens, lotions, and cooking oils) and yellowing over time. While polyester does not support fungal growth, any soiling present can enable it. Unlike nylon, polyester responds well to mild oxidizers and reducers.

1.2.3 Acrylic

Acrylic is a thermoplastic fiber formed by the polymerization of acrylonitrile. Acrylic is not as strong as other synthetics. It is often referred to as a synthetic alternative to wool, but it is stronger. Acrylic yarns are usually manufactured from staple fibers. The professional cleaner *should* treat acrylic as a spun yarn. While it has moderate resistance to abrasion, caution *should* be used when applying agitation.

Acrylic resists water-based stains because it is hydrophobic. It is resistant to degradation from sunlight and high temperatures. Acrylic has good resistance to alkalis, although this resistance decreases as the temperature, strength of the alkali, and dwell time increase. Acrylic is colorfast and resists both mineral and organic acids.

1.2.4 Olefin (Polypropylene)

Olefin (polypropylene) is developed through the polymerization of propylene gas with the aid of a metal compound, such as titanium chloride. Olefin is a water-resistant fiber. It absorbs less than 0.1% of its weight in moisture. Olefin is one of the lightest fibers and is sensitive to high heat. While its tensile strength is similar to nylons and polyester, olefin is less abrasion resistant. A lack of absorbency makes it difficult to dye or stain, even when exposed to acid dyes (e.g., red wine, artificially colored substances). It is typically solution dyed.

The professional cleaner *should* be aware that olefin is oleophilic which makes it prone to oil-based soiling and yellowing. Therefore, the cleaner *should* select cleaning agents that will break down these soils. Prolonged exposure to sunlight deteriorates the fiber to the point of disintegration. Olefin has good

resistance to alkalis, acids, and bleaches. If bleaches are needed, mild peroxide or reducing agents may be used.

Since olefin fabrics often have a latex back coating that can be affected by cleaning agents and direct sunlight, the cleaner *should* exercise caution when using solvent based spotting agents or aggressive agitation on olefin fabrics.

1.3 Woven Fabrics

Weaving is defined as the interlacing of two or more threads or yarns to form a fabric. The underside of a woven fabric is often coated to provide dimensional stability and to prevent yarn slippage.

The professional cleaner *should* be familiar with the following basic weaves which include but are not limited to:

- plain weave;
- twill weave;
- satin weave;
- pile weave; and
- jacquard weaves.

Fabrics made on a jacquard loom are included in this section, because this complex construction often combines elements of the other basic weaves.

1.3.1 Plain Weave

The simple under and over-interlacing of two yarns to create a fabric forms a plain weave, or basket weave. The warp yarns run lengthwise on a typical loom, and filling yarns (i.e., weft yarns or pick) run across the fabric.

Plain weave is the strongest and most durable of all weave types. The warp and filling yarns can provide tight, interlacing, and mutual support, although there are exceptions. Durability is a function of both weave and yarn construction (e.g., fiber type, yarn bulk, novelty effects, twist level, heat set, and finishes). The type of yarn is as important as how yarns are interlaced to hold them together. Haitian cotton is a common example of a non-durable plain weave, due to the presence of minimally twisted, bulky cotton-filling yarns. If not agitated in the proper direction (i.e., with the bulky weft yarns), fabric distortion is likely, even though the fabric is a plain weave. For this reason, cleaners *should* exercise caution when encountering bulky yarns on plain weaves. Due to the durable nature of most plain weaves, professional cleaners may use more aggressive cleaning methods when appropriate.

A variation of the plain weave that exhibits strength and durability is the basket weave. The basket weave consists of the same construction as the plain weave, except that instead of having yarns interlaced individually, they run in pairs.

1.3.2 Twill Weave

Twill weaves are formed by interlacing warp and weft (filler) yarns consecutively so that diagonal lines show on the face of the fabric. These diagonal lines usually progress from lower left to upper right (right-hand twill). Examples of twill include denim, herringbone, and houndstooth.

Twill weaves provide improved drapability and wrinkle resistance. They are second in strength to plain weaves. As with the plain weave, the twill weave can withstand more aggressive agitation. Careful pre-inspection of fiber and yarn durability *should* be performed to identify cleaning limitations.

1.3.3 Satin Weave

The term satin refers to a fabric woven of yarns not raised consecutively, as in a twill, but one with a prevalence of long floats in either the warp or filling direction. A float yarn is one that passes over the surface of a specific number of intersecting yarns (usually four or more) that are running perpendicular to the float yarn. The relatively unbroken pH of the float yarn produces a lustrous sheen on the surface of the fabric. For this reason, satin is considered a non-durable weave.

The professional cleaner *should* be able to identify satin weaves and other weaves with floating yarns. This is possible due to the lack of intertwining of the warp and filling yarns. Some strength and abrasion resistance can be sacrificed in a satin weave. Therefore, when cleaning satin weaves, the cleaner *should* first determine the direction of yarn float; and then work the fabric, particularly with regard to brush agitation, in that direction only. The direction of yarn float can be determined simply by rubbing the hand over the surface of the fabric very lightly in an inconspicuous area. When the surface is rubbed perpendicular to or across the float yarns, some resistance can be felt. Conversely, when rubbing the fabric parallel to or along the float yarns, it feels smooth and silky.

1.3.4 Pile Weaves

Pile weaves consist of three sets of yarns:

- warp yarns running lengthwise within the fabric;
- filling yarns running width wise; and
- pile yarns that form either the pile or a textured surface effect on the face of the fabric.

One system of weaving involves wires that are part of the weaving process. When pile yarns are woven into the fabric, they pass over these wires, which determine pile height. Upon completion of weaving, the sharpened ends of the wires are withdrawn, passing across the pile yarns, cutting them in the process. This process produces a cut-pile fabric.

The three most common pile weaves professional cleaners encounter are velvet, corduroy, and sculptured pile weaves:

1. Velvets: can be made using almost any fiber type discussed in the section on upholstery fiber cleaning characteristics. Refer to *Section 1.1 Natural Fibers and 1.2 Synthetic Fibers* for more information. Velvet fabrics are those with a uniform pile covering the entire surface of the fabric. If pile yarns are inserted in the warp direction (i.e., lengthwise) it is termed a velvet weave. Velveteen or velour refers to pile fabrics in which the pile yarns are inserted in a filling direction (i.e., width wise).

2. Corduroy: is a filling-pile fabric since alternating rows of filling-pile loops are cut to form the textured surface. Between the pile portions of the corduroy fabric, the filling-pile yarns are not raised or cut. This serves simply as additional reinforcement for the fabric itself. Corduroy is more durable than true velvet pile fabrics.

3. Sculptured: pile weaves are different from velvet and corduroy weaves because they are usually woven on a Jacquard loom that allows for the raising of the pile yarns only when called for in the pattern. When cut and brushed, this produces a sculptured effect on the face of the fabric, often in the form of a floral design.

Due to the tension placed on yarns during weaving, the pile tends to lie in a specific direction. This tendency is called nap or pile lay. The professional cleaner *should* be aware of nap or pile direction, because if the pile is agitated or otherwise manipulated in a direction other than with the nap lay during the cleaning process, there is a possibility for the pile to distort, or to dry in a distorted configuration. This is particularly true if natural or regenerated cellulose fibers are used in the pile yarn.

It is recommended that the cleaner take precautions not to over-wet pile fabrics, especially on cellulosic or regenerated cellulosic pile fibers.

The professional cleaner *should* pay special attention when grooming these fabrics to ensure leaving them in a uniform, lofted appearance. In order to achieve this, it is recommended that most cleaning and finishing be accomplished in the direction of the pile lay.

The direction of the pile lay can be determined by stroking the surface of the fabric lightly with one's hand. Resistance will be felt when rubbing against the lay of the pile, while less is felt when rubbing with the pile lay.

1.3.5 Jacquard Weaves

Jacquard weave refers to fabric formed by a complex weaving process accomplished on a loom invented by Joseph-Marie Jacquard. This loom has a punch card or computer system that controls the lifting of individual warp yarns to form the pattern, without any consideration of, or reference to, adjacent filling yarns. Therefore, a certain colored warp yarn may run undetected beneath the fabric's surface for a relatively long distance before being raised to complete the pattern the manufacturer desires.

A Jacquard weave is easily recognized since the back of the fabric is often similar to a photographic negative of the front. In other words, the majority color on the front side will be the minority color on the back of the fabric, and vice versa. Brocades, brocatelle's, damasks, matelassé, and tapestries normally are woven on Jacquard looms. Frequently, colors used in floral patterns appear in bands or stripes on the back of a Jacquard weave fabric. Due to the complex nature of some Jacquard weaves, they may be considered non-durable fabrics.

To achieve bright, clear patterns on the face of Jacquard fabrics, manufacturers often use rayon yarns woven in combination with cotton yarns. Rayon accepts a wide range of clear, bright colors, and the fact that it is a lustrous fiber further enhances its beauty when used in a fabric. The professional cleaner *should* be aware that some manufacturers use dyes that transfer easily from the rayon yarn to other areas of the fabric. The professional cleaner *should* pre-test ALL colors in the fabric for colorfastness before cleaning. When possible, testing for colorfastness on the underside of the fabric is recommended.

1.4 Other Manufacturing Techniques

Three other manufacturing techniques are common enough to warrant consideration in this section. They include flocking, tufting, and knitting.

1.4.1 Flocking

The construction of flocked materials begins with a plain-woven cotton or cotton/polyester base fabric. This fabric is coated with an adhesive upon which short, staple fibers are implanted in a uniform upright position. The fabric then goes through heat-curing and vacuuming to remove loose fibers, and other processes, which may include heat-transfer printing, since nylon face fiber is easily print-dyed.

Flocked fabric is easy to recognize visually since there is no weave present on the face of the fabric. The short fibers (frequently nylon) on the face of a flocked fabric are typically lustrous. The professional cleaner *should* not use dry solvents on flocked fabric as this may affect the adhesive and release the face fibers. Wet cleaning is recommended for most flocked fabrics.

The professional cleaner *should* be aware of the following potential problems with flocked fabrics which include, but are not limited to:

- abrasive wear or heavy use may result in bald spots in the fabric. This usually occurs first along the front edge of cushion piping and on arm faces or tops where regular hand contact is made;

- aggressive agitation, especially with brushes, can remove face fibers and *should* be avoided; and
- the build-up of body oils on body contact areas, which over time can dissolve the adhesive holding the pile fiber to the base fabric. In this case, the face fiber may be removed along with the soil.

1.4.2 Tufting

Tufting is a manufacturing process involving sewing or stitching yarns into a plain-woven backing material, much like carpet. The tufts, which form the pile, may be left in a loop-pile design or they may be sheared to produce a velvet-like appearance. A coating of adhesive is applied to the backside of the fabric following tufting to lock the tufts in place. Unlike carpet, no secondary backing is used.

1.4.3 Knitting

In the knitting process, the manufacturer uses a knitting machine to make the interlocking loops of yarn that form the fabric. Some warp-knit and face-to-face pile-knitted fabrics are used in upholstery.

1.5 Additional Considerations

1.5.1 Cleaning Codes

Furniture manufacturers use a labeling system for cleaning codes to assist consumers in determining spotting or cleaning agents. Regardless of the cleaning code on a fabric, the professional cleaner *should* test the fabric's suitability for the cleaning method and agents to be used.

CODE	MEANING
"W"	Fabric may be cleaned with water-based spotters/cleaners
"W-S"	Fabric may be cleaned with either water or dry solvent-based spotters/cleaners
"S"	Fabric may be cleaned with dry solvent-based spotters/cleaners
"X"	Only brushing or dry vacuuming is recommended

Chart 1: Cleaning Codes

1.6 Non-Durable Constructions

Delicate, non-durable constructions, such as satin weaves, pile weaves, knitted fabrics, flocked fabrics, or fabrics with bulky yarns may present potential problems in the cleaning process. The professional cleaner *should* identify these fabrics and use appropriate cleaning agents, limit agitation, or take other steps necessary to preserve fabric integrity.

1.6.1 Chintz

Chintz fabric is usually printed and made with plain-woven cotton, polyester, rayon, or blended fabric treated with durable or non-durable resins. It is glazed or set with hot rollers or heat curing. Also known as "glazed" or "polished" cotton, chintz has a high-gloss appearance that is designed to resist soiling and staining. The So non-durable glaze usually is made of wax and starch compounds set with hot rollers. Durable glaze consists of urea or melamine resins that are applied, and heat cured. The glazed finish may be dulled with abrasive use, body oils, or aggressive cleaning. It is recommended that the professional cleaner notify the client of cleaning limitations and complexities. Once lost, the finish cannot be restored through cleaning.

1.6.2 Quilted Fabrics

The quilted fabric consists of three layers of fabric: face fabric, batting or cushion, and base fabric. The layers are sewn or stitched together in a pattern. The professional cleaner *should* be aware, the most common issue associated with quilted fabrics involves shrinkage and puckering associated with base fabrics or the stitching around patterns on the face fabric. Typically, dry solvent or low moisture cleaning avoids most shrinkage problems associated with quilted fabrics. These methods also help avoid issues with fugitive dyes from the underlying layers.

1.6.3 Stitch-Bonded Fabrics

Stitch-bonded fabrics consist of two layers of fabric. The layers are sewn or stitched together in a pattern. The professional cleaner *should* be aware, the most common issue associated with stitch-bonded fabrics involves shrinkage and puckering associated with base fabrics or the stitching around patterns on the face fabric. Typically, dry solvent or low moisture cleaning avoids most shrinkage problems associated with quilted fabrics. These methods also help avoid issues with fugitive dyes from the underlying layers.

1.6.4 Moiré

Moiré is upholstery or drapery fabric made by embossing a wood grain or watermarked design on a ribbed weave. Historically, such designs have been created using engraved rollers, pressure, and heat. Newer techniques may produce more stable patterns. Fibers used in moiré fabrics usually include silk, rayon, acetate, polyester, and nylon. The professional cleaner *should* be aware that legacy moiré fabrics can present problems, including distortion of the embossed design by aggressive agitation, ring marks (i.e., watermarking), and potential shrinkage, depending on fiber content.

1.6.5 Crushed or Embossed Velvets

Crushed velvet is produced by changing the velvet pile characteristics. The fabric is placed between rollers, then heat, moisture, and pressure are applied. The pile is pressed in various directions depending on the desired effect. As a result, the light reflection from the pile varies from dark to light.

Embossed velvet is also produced by modifying the pile. The velvet can be embossed using engraved rollers or block printing. Another method first flattens areas that will remain higher, the surrounding pile is sheared to a lower height, then the fabric is steamed to raise the flattened pile, which then stands higher than the sheared part.

Most crushed and embossed velvets can be dry-cleaned, but special precautions *should* be taken to ensure that the pile design is not distorted or removed. Designs that are created with heat, moisture, and pressure can be removed by any one of these factors during wet or dry cleaning. Most finishes applied to modify velvets are not permanent. Dry cleaning is recommended if the crushed or embossed velvet consists of regenerated cellulosic fibers. If the "crush" or embossed design is heat-set, synthetic fiber velvets can typically be wet cleaned without difficulty. The professional cleaner *should* notify the client of limitations and complexities, as neither the crushed nor the embossed effect if altered, can be restored through cleaning.

1.6.6 Natural Fiber Fillings

Although most furniture manufacturers and upholsterers use synthetic filling and padding, some natural fiber padding is still used directly under the face fabric. Any amount of moisture reaching cotton padding, jute, or burlap webbing creates the potential for cellulosic browning. Feather or down padding can mold and develop a malodor in the presence of moisture. Moisture control *should* be used when these materials are present.

1.6.7 Skirts

Skirts may be simple or complex, flat, ruffled, or pleated**.** Interfacing used in skirts may contain cellulose material (i.e., cardboard, buckram). Since the lower portions of skirts are not secured, they are more prone to shrinkage and could curl as a result. Skirts *should* be handled with care as they may be poorly secured.

It is recommended that dry sponges are used to remove hard lines on the skirt along the bottom of the furniture frame (commonly from pets and boots), rather than repeated wet cleanings.

1.6.8 Seams, Piping, Cording, Welting, and Stitching

Seams, piping, cording, welting, and stitching of upholstery can be sewn by machine or hand, and these areas may consist of multiple layers of fabric. The professional cleaner *should* treat these areas carefully to avoid damage to the stitching and to avoid excessive moisture buildup, which could result in shrinkage, browning, or dye migration.

1.6.9 Buttons

Buttons can be made of plastic, or metal shell and base. They are typically attached by synthetic yarn or twine**.** The professional cleaner *should* use caution when working around buttons to avoid pulling them off. Cleaners *should* avoid leaving excessive moisture near buttons as oxidation (e.g., rusting, corrosion) of the metal shells and shanks may occur, staining the fabric, if drying is prolonged.

1.6.10 Metal fasteners

Most outside upholstery panels are attached with a metal tack strip or a flexible metal band. They are typically placed directly under the fabric without a protective covering. The Professional Cleaner *should* use caution when working near metal fasteners. Cleaning over these metal fasteners with a metal cleaning tool (i.e., without a glide) can result in abrasive damage. As with metal buttons, prolonged drying may result in rust stains.

2 Principles of Professional Upholstery Cleaning

Cleaning is the process of removing unwanted substances from a built environment without damaging surfaces or substrates.

Although most fabric-covered upholstery is cleaned on location in a customer's home or business, it is recommended that some fabrics benefit from cleaning processes that are best performed under controlled conditions off-site. Examples include, but are not limited to:

- extensive dry solvent cleaning or solvent-based protector application;
- use of cleaning agents requiring copious ventilation;
- articles that require multiple cleanings for acceptable results;
- contaminated environments, (e.g.,) smoke damaged sites;
- unstable work surfaces; and
- corrections like color bleed, cellulosic browning, and shrinkage.

2.1 Principle 1: Dry Particulate Soil Removal

Dry soil, such as hair, lint, particle soil, dust, and debris *should* be removed from the fabric to the fullest extent practical before the application of any cleaning agents, pre-treatments, or moisture. Depending on fabric type and vulnerability, dry soil removal tools may include a quality vacuum cleaner, a lint roller, a suitable brush agitator, or a dry latex sponge. If the equipment used for dry vacuuming does not have a high-efficiency filter, it is recommended that the vacuum exhaust be directed outside the structure to avoid contaminating indoor air.

The Professional cleaner *should* inspect the vacuum, before use to determine that the collection chamber or bag is not full (i.e., typically, less than one-half to two-thirds full); there are no obstructions blocking the air path, and any tool heads are undamaged to ensure that fibers and yarns are not snagged or pulled.

2.2 Principle 2: Soil Suspension (Separating Adhered Soil)

Soil suspension is intended to separate the adhered soils from fibers not removed during dry soil removal procedures (Principle 1) from fibers.

Maximum soil suspension incorporates four elements:

1. Chemical activity;
2. Heat or temperature to accelerate chemical activity;
3. Agitation for proper chemical distribution; and
4. Time for chemicals to function properly.

When one or more of these four fundamentals is decreased, it is recommended that one or more of the others be increased to accomplish complete soil suspension. Each method or system of cleaning addresses the fundamentals of soil suspension with different emphasis. The professional cleaner *should* understand the objective of the cleaning system is to suspend and separate soil from fibers, as much as practical, without damaging fibers, dyestuffs or textures, in preparation for subsequent soil removal.

Cleaning agents *should* be applied evenly to the fabric's surfaces after dry soil removal is accomplished and the selected cleaning agent has been tested to confirm that it will not adversely affect the fabric or dye system. Heavily soiled areas such as arm tops, seat cushions, or pillows may require further attention such as different cleaning agents, boosters, or additional agitation.

2.2.1 Chemical Activity

Where appropriate, biodegradable detergents, builders, or dry solvents *should* be used to suspend, emulsify, peptize, or saponify the various soluble or insoluble soils. The professional cleaner performing the work *should* select the appropriate cleaning agents. A cleaning solution *should* be chemistry suited to the vulnerabilities of the fibers in the fabric. pH and alkalinity (buffering) *should* be understood and considered, particularly for protein and natural fibers. The cleaner *should* understand that pH does not directly correlate to acidity or alkalinity.

Cleaning products *shall* be used according to label instructions.

2.2.2 Heat or Temperature

Increased cleaning solution or rinse-water temperature may be used to accelerate chemical reactions that lead to soil suspension, which may result in increased cleaning efficiency. Increasing temperature can also reduce the quantity of cleaning agent required, which can result in less detergent residue following cleaning. The professional cleaner *should* use caution when cleaning natural fibers such as wool, silk, or linen, or delicate fabric constructions, such as satin or velvet weaves, because they may suffer from the additional heat.

2.2.3 Agitation (Mechanical Action)

The professional cleaner *should* use agitation in a manner that evenly distributes cleaning solutions throughout soiled fabrics without causing damage. Agitation also aids in physically loosening soils from the surface of the fiber. Depending on the vulnerability of a fabric, agitation may be accomplished using a brush, towel, water pressure or other suitable methods. Excessive agitation *should* be avoided on delicate fibers (e.g., wool, silk, linen, and some cotton), fabrics (e.g., satin, velvet, flocked), or fabric finishes (e.g., chintz, moiré).

2.2.4 Time

Soil suspension is not instantaneous. Following application, cleaning products (e.g., preconditioners), the professional cleaner *should* allow sufficient contact or dwell time for adequate soil suspension to occur.

Dwell times can vary based on, but not limited to, the following:

- chemical formulation;
- the cleaning method;
- level of agitation,
- application temperature;
- the type of fiber;
- dye stability; and
- amount of soil.

Cleaning product manufacturer labels can provide guidance in this area. With a few exceptions (e.g., encapsulation) preconditioners *should* not be allowed to dry before soil extraction takes place.

2.3 Principle 3: Suspended Soil Removal (Extraction)

Once soil suspension has been achieved, soil extraction may take place. Soil removal or extraction processes *should* be performed thoroughly and evenly to ensure uniform cleaning.

The methods to remove suspended soils include, but are not limited to:

- absorption;
- adsorption;

- rinsing;
- wet vacuuming; or
- vacuuming the fabric when dry.

Professional cleaners *should* employ the method(s) that they determine would best clean a given piece of upholstery safely and effectively.

2.4 Principle 4: Pile Setting or Grooming

Pile fabrics *should* be cleaned with extra care. Permanent marks may be left in pile fabrics if cleaning tools are used incorrectly. The cleaning process *should* not adversely affect fibers or fabrics.

During or after cleaning, pile fabrics *should* be groomed or set to enhance their appearance. Grooming *should* continue until no visible lines or marks are left that may be attributed to the cleaning process. Some fabrics (e.g., cotton, rayon) may require partial drying before final grooming can be accomplished.

2.5 Principle 5: Drying

The amount of time required for the upholstery to dry varies, depending on the amount of moisture used in cleaning, the type of fiber and fabric, and prevailing temperature and humidity conditions. Fabrics *should* be dried as quickly as possible. Natural fibers or non-colorfast fabrics *should* be dried quickly, since they may be prone to problems associated with prolonged drying.

To reduce the risk of cellulosic browning and/or dye migration, the professional cleaner *should* ensure adequate ventilation and air movement to expedite drying. Loose seat cushions, pillows, and arm covers *should* be dried on a colorfast surface (e.g., drop cloth, tarp, folding table), maintaining separation and turning them as required to ensure rapid and uniform drying.

Following cleaning, details regarding post-cleaning inspection can be found in *Section 7 Pre-Cleaning and Post-Cleaning Inspections (including Administrative Procedures).*

3 Equipment and Tools

Various types of equipment and tools are available for the maintenance and care of upholstery and textiles. Selection is based on factors such as equipment performance and reliability, textile and furniture manufacturers' guidelines, budget, fabric type and construction, and degree of soiling.

Many types of equipment that were developed for use with one specific method of cleaning may now be used by professional cleaners to perform a variety of cleaning methods. The professional cleaner *should* assess upholstery and textiles and select appropriate equipment that meets or exceeds cleaning goals.

3.1 General Equipment and Tools

3.1.1 Extraction and Power Tools

The following is a list of equipment and tools that may be used in professional upholstery cleaning:

- dry particulate extraction unit (vacuum with appropriate attachments);
- portable extraction unit with hoses (e.g., Hot Water Extraction (HWE), water rinse extraction, spotting, dry foam units);
- truck mount system with hoses;
- foam or shampoo-generating equipment/machine;
- hand orbiter (e.g., bonnet tool);
- variable speed rotary tool (drill);
- vapor steamer;
- air mover;
- lights-inspection, black, chemical activation; and
- steam iron.

3.1.2 Testing supplies

The professional cleaner *should* have the knowledge and supplies to carry out the necessary tests to identify vulnerable fibers and fabrics. Some common pre-cleaning tests include, but are not limited to:

- burn test
- colorfastness test;
- ferrous metal test;
- pH test; and
- shrink test.

3.1.3 Hand Tools and Accessories

Accessory options that may be used include, but are not limited to:

- handheld upholstery extraction tool (e.g., single jet (internal & external), jet-less);
- spotting kit;
- scrapers;
- spotting spatula;
- buckets for solution mixing;
- towels;
- sponges;
- brushes;
- sprayers and foam applicators;
- measuring cups;
- injection syringe;
- absorbent drop cloth, (e.g., moving blankets or painters' drop cloth);
- portable work surface (e.g., folding table, ironing board); and

- polyester extraction screen.

Refer to Sections 3.2.1 Sprayers, 3.3.1 Brushes, and 3.3.2 Accessories for more information.

3.2 Spray Application Equipment

The sprayer *shall* be labeled for content identification and safety reasons. The professional cleaner *shall* keep each bottle properly labeled. The cleaner *shall* not reuse or fill spray bottles or sprayers with a different product than what is listed on the label. If using a sprayer for a different product, it *should* be thoroughly rinsed before the addition of another product. The professional cleaner *shall* comply with applicable local, state, provincial, and federal regulations.

3.2.1 Sprayers

When using sprayers, the professional cleaner *should* be careful not to over-wet the fabric by controlling the pressure and flow rate and not to discharge spray over customer property beyond that which is being cleaned. A variety of sprayers are available, which include, but are not limited to:

- trigger sprayers;
- hand pump foamers;
- pump sprayers;
- air pressure sprayers;
- in-line sprayers; and
- power sprayers.

3.3 Agitation and Finishing Tools

It is recommended that care be taken in selecting the correct tools to prevent damage to the upholstery or textile. Some tools may be too stiff and aggressive for use on certain upholstery or textile styles. Fine-denier fibers *should* be agitated and finished with a softer, less aggressive tool.

Aggressive use of agitation and finishing tools can result in damage to upholstery fibers and weaves. (e.g., felting of wool, distortion, abrasion, tip flaring/blooming, damage to effect yarns, novelty yarns, floating yarns, slubs, and non-durable weaves).

3.3.1 Brushes

Brush types used in upholstery cleaning include, but are not limited to:

- tampico brush;
- spotting brush;
- horse-hair brush;
- velvet carding brush;
- tamping brush;
- brass brush, and
- rubber brush.

3.3.2 Accessories

Work with brushes may be preceded, enhanced, or followed by the use of:

- towels (e.g., microfiber, or terry);
- sponges (natural or synthetic);
- hand bonnets; and
- lint removers.

3.3.3 Specialty Tools

It is recommended that the professional cleaner invests in additional tools or instruments to improve their ability to identify unusual features in fabrics and correct minor issues. Examples include:

- 30 X pocket or electronic microscope;
- pill remover; and
- duckbill napping shears.

4 Pre-Cleaning and Post-Cleaning Inspections (Administrative Procedures)

The professional cleaner *should* conduct a written pre-cleaning inspection.

The purpose of the pre-cleaning inspection is to gather information and provide a written report on the condition of the textile or upholstery. The professional cleaner *should* identify variables that could affect the outcome of the cleaning. It is recommended that the cleaner achieves this using survey forms or photographs to protect the cleaner and ensure customer satisfaction.

Pre-cleaning inspections allow professional textile and upholstery cleaners to know what areas are to be cleaned, the fiber and construction of the textile or upholstery on which they are working, the type and degree of soiling, and the procedural approach to the job.

The professional cleaner *should* also perform a post-cleaning inspection with the client wherever possible. The objective of the post-cleaning inspection is to evaluate the result of cleaning and to ensure that cleaning objectives have been met to the satisfaction of both the cleaner and the client.

The post-cleaning inspection *should* be conducted and include, but not be limited to:

- advising clients about drying considerations and when they can expect to resume normal use;
- provide the opportunity for recommendations about maintenance, cleaning frequencies, and the use of appropriate methods and systems; and
- use of fabric protectors.

4.1 Customer Interview and Pre-Cleaning Inspection

The professional cleaner *should* complete the customer interview and pre-cleaning inspection before beginning the cleaning process. The customer interview allows the professional cleaner to gather pertinent information and help decide which cleaning agents and processes to use.

The professional cleaner *should* discuss with the client the requirements and concerns observed during the pre-cleaning inspection. The cleaner *should* also set client expectations based on their findings.

It is recommended that the following information be collected during the initial interview, including, but not limited to:

- fiber type;
- approximate age of the textile or upholstery;
- maintenance history (e.g., both professional and do-it-yourself);
- treatments or spotting agents used;
- protectors applied;
- deodorizers used;
- indoor pets present;
- occupant-use history;
- textile or upholstery defects;
- history of previous losses/damage;
- vacuuming frequency; and
- client expectations.

Upon completion of the client interview, the professional cleaner *should* conduct an inspection of pre-existing textile or upholstery conditions. Pre-existing damages *should* be notated, and the client informed. It is recommended that the damage be photo documented.

The professional cleaner *should* look for pre-existing conditions that can include but are not limited:

- sun, fume, or ozone fading;
- bleeding or crocking;
- particulate soil buildup;
- wear patterns and heavy-use areas;
- filtration soiling;
- animal stains, discoloration, or malodors;
- obvious damage;
- weakness due to age, environmental exposure, or use;
- matting or crushing based on fiber type;
- shading, pooling, watermarking, or fiber reversal;
- spots, stains, or discolorations;
- presence of metal components;
- shrinkage of cushions and skirts; and
- interior markings, fillers, or stuffing that might bleed through to the fabric's surface during cleaning, application of fabric protector, or drying.

Following pre-cleaning inspection for existing conditions, the professional cleaner *should* review any posted fabric composition (e.g., fiber type or blends) and construction (e.g., framing and/or filling) of textile or upholstery to ensure that listed cleaning processes can be used. The professional cleaner *should* conduct a colorfastness and fiber test regardless of manufacturer's labels to help determine the cleaning solution pH (i.e., alkaline, acid, or neutral) and process. The cleaner *should* conduct these tests in an inconspicuous area of the textile or upholstery (e.g., the back of a skirt).

The professional cleaner *should* determine a suitable area in which the textile or upholstery is to be cleaned and take precautions to protect adjacent vulnerable surfaces (e.g., engineered wood floor, viscose rug). Additional tests that may need to be performed include:

- shrink test;
- distortion test;
- crocking test; and
- ferrous metal button test.

4.1.1 Ferrous Metal Button Test

Buttons have the potential to trap moisture for prolonged periods following the cleaning process. These buttons will most often be covered by either a matching or contrasting fabric. A button hidden under the fabric can be plastic or metal. Buttons that appear to have a plastic cap can have a ferrous back-plate. If moisture is trapped for a prologed period by buttons with ferrous back-plates, oxidation may occur and rust may transfer from the button to the fabric around it causing a stain. Therefore, the professional cleaner *should* determine if buttons have a ferrous back-plate. This *should* be performed with a magnet strong enough to detect the back-plate through the thickness of any plastic cap.

At the end of the cleaning process, the professional cleaner *should* attempt to remove as much moisture as possible from the fabric under the button to avoid rust marks. It is recommended that the professional cleaner use furniture tabs to eliminate direct contact between the back of the button and the fabric behind it, and advises the customer of an appropriate timescale for their removal and disposal.

Photo 1: Chair with Ferrous Metal Buttons

Upholstered reclining chair with ferrous buttons, with furniture tabs in place to reduce the risk of rust marks to the fabric behind them.

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Photo 2: Shrink Test in Progress

Photo 3: Dye Bleed Test in Progress

4.2 Post-Cleaning Inspection

It is recommended that the professional cleaner conduct a preliminary post-cleaning evaluation before fabric protector application or involving the client.

Professional cleaners *should* ensure that proper conditions have been established to promote drying.

Once the initial post-cleaning evaluation is completed, the professional cleaner *should* conduct a post-cleaning inspection with the client to ensure satisfaction and that expectations have been met. Any concerns identified after the cleaning process *should* be discussed with the client at this time. Concerns can include, but are not limited to:

- initial findings that could not be corrected;
- client's expectations;
- permanent staining;
- traffic distortion of fibers;
- shading;
- fading;
- excessive soil wicking due to lack of maintenance;
- physical damages; and
- drying conditions and time frame to return to use.

It is recommended that any remaining spots, stains, or damage be documented.

The professional cleaner *should* discuss and communicate proper maintenance (i.e., vacuuming, spotting), and professional cleaning schedules to preserve the textile or upholstery.

Once an agreement has been reached that the work has been satisfactorily completed, any additional applications requested may be applied (e.g., protectors or deodorizers).

5 Methods and Systems of Cleaning

It is recommended that upholstered fabrics be cleaned and maintained monthly for routine cleaning. Upholstered fabrics *should* be professionally cleaned (e.g., interim/periodic cleaning) at least every 12-24 months, depending on the fabric's use, degree of soiling, and location. When upholstered fabrics have not experienced routine and interim/periodic cleaning, and have been subjected to abnormal, excessive soiling or staining, they may require "restorative" cleaning techniques. Restorative cleaning techniques are more aggressive and may involve a combination of methods, procedures, and cleaning agents that go beyond interim/periodic cleaning procedures outlined in this standard. The professional cleaner *should* use their judgment and experience in attempting to restore these fabrics. Cleaners *should* identify any potential limitations of cleaning results before restorative cleaning attempts.

5.1 Levels of Cleaning

According to fabric manufacturers, upholstery needs to be routinely maintained and cleaned to prevent soil build-up. Fabric maintenance can be achieved by a combination of consumer vacuuming, spill management, and professional cleaning.

The fabric's condition, if poorly maintained, may limit the level of appearance that can be achieved by the professional cleaner. The following important factors *should* be considered in order to properly set expectations for cleaning results:

- age of the fabric;
- condition of the fabric;
- maintenance history of the fabric;
- type of soil present;
- amount of soil present; and
- how each of these variables affect composition of the fabric.

Restorative cleaning may be necessary if the fabric has not been maintained properly or is not on a periodic cleaning program. The three industry recognized levels of cleaning are:

- routine (maintenance);
- interim/periodic; and
- restorative.

A variety of cleaning methods, or combinations thereof, may be necessary to effectively clean upholstery. The best method of cleaning *should* be determined by a professional cleaner with specialized knowledge and experience, trained and validated through testing and certification.

5.1.1 Routine Cleaning (Maintenance)

Furniture and fabric manufacturers recommend that upholstered furniture be maintained on a routine basis. Routine cleaning includes procedures such as vacuuming, attending to spots, and wiping surfaces as required based on fiber type, fabric construction, usage, and environmental conditions. Routine cleaning helps to keep furnishings in a more attractive and healthy state, while preventing premature wear. It is recommended that routine cleaning be performed at least monthly. Increased maintenance frequency is recommended for delicate fabrics. If the frequency of routine cleaning is adequate, interim/periodic cleaning will be more successful, and the need for restorative cleaning will be reduced.

5.1.2. Interim/Periodic Cleaning

Interim/periodic cleaning is the process of thorough cleaning using one or more of the cleaning methods described in this standard. It *should* be performed periodically, based on fiber type, fabric construction, usage, and environmental conditions. Interim/periodic cleaning *should* be performed approximately every 12 to 24 months with light to moderate use. Interim/period cleaning *should* be performed by a professional

cleaner using the procedures outlined in this standard. Interim/periodic cleaning can help to delay or prevent permanent damage to fibers, dyes, or fabric texture.

5.1.3 Restorative Cleaning

When a lack of maintenance results in severe soiling, the professional cleaner *should* employ restorative cleaning methods in an attempt to return the upholstery to an acceptable condition. Restorative cleaning goes beyond interim/periodic cleaning processes and is typically performed by a professional cleaner specially trained or skilled in restorative cleaning procedures using more aggressive techniques and cleaning agents. Any limitations or complexities associated with such procedures *should* be adequately documented.

5.1.3.1 Salvage Cleaning

In cases when restorative cleaning is unable to obtain the desired results, salvage cleaning may be a last option. Salvage cleaning is the use of extraordinary efforts to clean a textile that is soiled (and possibly stained) beyond technician's ability to restore it using safe, industry accepted techniques.

In situations where restorative cleaning fails to achieve the desired results, further attempts to restore the item may result in deviation from the standard of care as outlined in this document and *should* be regarded as salvage cleaning. Before commencing such work, the client *should* receive an appropriate explanation with adequate documentation. Work *should* only begin with an appropriate authorization from the client.

Salvage cleaning can include but is not limited to:

- outdoor furniture with biological growth;
- smoke or water damaged furniture;
- items with excessive wear;
- items with sentimental value;
- heavily soiled items that don't respond to restorative cleaning; and
- stain removal of spots and stains that do not respond to regular spot cleaning methods.

Refer to *Section 11 Limitations, Complexities, Complications and Conflicts*.

5.2 Factors Limiting Cleaning Effectiveness

No matter how careful a professional cleaner is, there may be unforeseeable conditions that exist, which could produce undesirable results. Unforeseeable conditions may include but are not limited to:

- fabrics that have not been pre-shrunk;
- presence of overdyed fabrics or potential fugitive dyes;
- instructional marking on fabrics, fillings, or other internal materials; and
- fabric is not as durable as anticipated.

The results of unforeseen conditions may include but are not limited to:

- watermarks;
- browning;
- shrinkage;
- dye migration;
- appearance change;
- texture change; and
- loss of fiber (e.g., flocking).

If the professional cleaner follows the standard of care, unanticipated results may still arise. The cleaner *should* notify the customer of these possibilities. When the cleaner follows standard procedures, and the customer understands the risks involved, the cleaner *should* not be held responsible for undesirable results.

5.2.1 Risk Assumption

Ultimately, the professional cleaner can guarantee only to give customers qualified expertise and workmanship, combined with effective results consistent with the cleaning situation they encounter. Although the cleaner *should* make a reasonable effort to avoid any unforeseeable problems, there are often risks involved that are beyond their control.

The professional cleaner *should* evaluate the soiling and furniture condition before beginning the cleaning process. It is recommended that the cleaner's findings be listed in writing on a Furniture Condition Report Form and explained to the customer before obtaining a signature. Customers who have problematic upholstery fabric cleaned are doing so strictly at their own risk. It is recommended that cleaners have an assumption of risk or release of liability form available for such situations.

5.3 Dry Solvent Cleaning Method

The dry solvent cleaning method is reserved primarily for water-sensitive or non-colorfast fabrics that can be damaged when using water-based (wet) cleaning processes. The term "dry solvent" refers to non-water, hydrocarbon-based compounds, commonly referred to as "dry cleaning solvents." Dry solvent cleaning is generally considered safe for most natural and synthetic fibers, and dyes.

Dry solvents may damage adhesives or latex back coatings. When using dry solvents on latex back coatings, or on flocked or glazed fabrics, the professional cleaner *should* exercise extreme caution to prevent damage to them.

5.3.1 Safety Concerns

Dry cleaning solvents are hazardous chemicals that *shall* be handled with the required level of care. Dry solvent cleaning *shall* be performed in accordance with the Authorities Having Jurisdiction (AHJ). These regulations may restrict the use of dry solvents in certain locations and present significant disposal challenges.

Manufacturers of portable dry-cleaning equipment and chemicals prescribe the use of PPE when working with their products on their Safety Data Sheets (SDS) and label directions.

The prescribed PPE can include but is not limited to:

- dry solvent-resistant gloves;
- splash goggles; and
- organic vapor respirators.

Adequate ventilation *shall* be used at all times. Unprotected individuals *should* leave the area during cleaning and the evaporation period of the solvents used to clean the fabrics.

Additional safety precautions for dry solvent cleaning may include but are not limited to the items described in *Sections 5.3.2 Product Labels and Instructions and 5.3.7 Disposal and Storage*.

5.3.2 Product Labels and Instructions

Manufacturer equipment instructions and product label directions *should* be followed.

5.3.3 Vapor Emissions Control

Exhaust ventilation *should* be increased using fans placed in available windows and doors within rooms where dry solvent cleaning is taking place.

Professional cleaners *shall* ensure that vapors generated indoors during the injection/extraction cleaning are exhausted outdoors. Cleaners *should* know that dry solvent vapors are flammable and hazardous to health. Engineering controls such as the introduction of warm, dry, and clean make up air combined with adequate ventilation of the solvent vapors is paramount and *should* be monitored throughout a dry solvent cleaning project. The cleaner *should* understand that the vapor levels may still exceed those deemed safe for vapor exposure levels by the authorities having jurisdiction (AHJ).

A dry solvent extraction machine's exhaust hose *should* be connected. The cleaner *shall* ensure that vapors are exhausted outside the structure at a distance that is specified by the AHJ. The professional cleaner *shall* exercise caution to prevent vapors from migrating to areas where unprotected persons can breathe them, or where they may be blown back into the structure by prevailing winds.

Engineering controls *shall* be installed to prevent solvent vapors from circulating into other rooms of the structure where occupants may be present. If it is not practical to perform dry solvent cleaning away from cold air returns of HVAC systems, they *should* be closed off and sealed with plastic, or the structure's air handling system may be deactivated to avoid potential distribution of solvent vapors to other areas.

The concentration of dry solvent vapors *shall* not exceed flammability levels specified on product labels or SDSs, nor *shall* they exceed the AHJ or American Conference of Governmental Industrial Hygienists (ACGIH) Permissible Exposure Limits (PELs), without the appropriate engineering controls and PPE.

5.3.4 Occupant Protection

Unprotected persons and pets *should* not be allowed to enter a room where cleaning is being performed. Small children, the elderly, small animals with high respiratory rates (e.g., birds, fish, reptiles, and small mammals such as hamsters), and especially infants and persons with respiratory problems are particularly sensitive and *should* not be exposed to dry solvents or solvent vapors.

5.3.5 Dry Solvent Use Safety

Heating solvents are extremely hazardous and are not recommended.

The openings on equipment solution tanks or sprayers *should* remain tightly closed to prevent vapor escape or inadvertent spills.

Smoking *should* not be permitted while using dry cleaning solvents. In addition, to obvious flammability problems, solvent vapors, when inhaled through a cigarette, may become extremely toxic.

Dry cleaning solvents *should* not be used in rooms where pilot lights or open flames (e.g., gas or fuel oil-fired water or space heaters) are present, or where radiant electric heaters are in operation.

A cleaning unit *should* be plugged in to an electrical outlet as far as reasonably practical from the fabric being cleaned. While the unit is being unplugged, arcing of electricity may present a potential flammability hazard. Due to this hazard equipment *should* be powered off before unplugging. Electrical equipment *should* be properly grounded.

Drop cloths *should* be used to protect floor coverings from contamination. If dry solvent is sprayed onto finished wood, it *should* be wiped off immediately. Cloths used to clean up solvent residue may be flammable or combustible and *should* be discarded in an approved fireproof container.

5.3.6 PPE

When cleaning with dry solvents, professional cleaners *shall* wear National Institute for Occupational Safety and Health (NIOSH) approved, fit-tested respirators with the appropriate fresh sorbent cartridge attached, approved by formulators for specific dry solvent vapors. If the professional cleaner detects a solvent odor, respirator filter cartridges *shall* be replaced immediately.

Splash goggles *shall* be worn for eye protection. Dry solvent resistant gloves *shall* be worn to prevent absorption of dry solvents through the skin. A solvent resistant apron *should* be worn to prevent the transfer of solvent to skin or clothing.

5.3.7 Disposal and Storage

Dry solvents *shall* not be disposed of through drains or sewer systems. Recovered solvents *should* be collected and returned to the company facility and *shall* be disposed of in accordance with the AHJ.
Dry solvents *shall* be stored in properly labeled, flame-resistant, manufacturer-approved containers.

5.3.8 Dry Soil Removal

Dry soil removal *should* take place before the application of dry solvents. Refer to *Section 2.1 Principle 1: Dry Particulate Soil Removal* for more information.

5.3.9 Soil Suspension

Soil suspension fundamentals *should* be applied. Refer to *Section 2.2 Principle 2: Soil Suspension (Separating Adhered Soil)* for more information. Upholstery fabrics and lining materials *should* be tested for color fastness before applying cleaning agents. Refer to *Section 4.1: Customer Interview and Pre-Cleaning Inspection* for more information.

5.3.9.1 Chemical Action

A suitable dry solvent, or dry-solvent pre-conditioner, may be applied to heavily soiled areas of the fabric using a colorfast (preferably white) towel or dry solvent-compatible sprayer.

5.3.9.2 Heat or Temperature

Although warming dry solvents may increase cleaning efficiency, heating solvents is extremely hazardous and is not recommended.

5.3.9.3 Agitation

It is recommended that a dry solvent-compatible upholstery brush, sponge, white microfiber towel, or hand bonnet be used as needed, to work dry solvents into heavily soiled fabrics. Excessive agitation *should* be avoided on delicate fibers (e.g., wool, silk, linen, and some cotton), fabrics (e.g., satin, velvet,), or fabric finishes (e.g., chintz, moiré).

5.3.9.4 Dwell Time

Product labels *should* be referenced in regard to dwell time. Extraction *should* begin before dry solvents or solvent preconditioners evaporate completely.

The professional cleaner *should* make every attempt to minimize solvent vapors being released into the atmosphere. Using solvents with adequate ventilation and shorter dwell times *should* be the primary work practices employed.

5.3.10 Soil Removal (Extraction)

When the use of spray mist devices is justified, they *should* be dry solvent approved. Other application methods include absorbent materials such as natural sponges or towels. Recovery (e.g., absorb, extract) of suspended soil and excess solvent *should* immediately follow application. Colorfast (i.e., preferably white), adsorbent or absorbent towels, pads, or the vacuum recovery system of a dry solvent-approved extraction unit may be used. Multiple passes with an extraction tool may be necessary for optimum cleaning subject to the fabric's ability to withstand the cleaning action. Following the use of an extraction tool, blotting, or wiping fabrics with adsorbent or absorbent materials, such as colorfast microfiber, terry cloth towels or hand bonnets is recommended.

5.3.11 Pile Setting or Grooming

It is recommended that pile fabrics (e.g., velvet or velour) or any fabric construction that displays a fuzzy or matted nap appearance be groomed immediately after cleaning to prevent texture change. Brushes (e.g., velvet carding, velvet, nylon, horsehair) or colorfast towels can be used to eliminate tool marks and matting to leave the finished fabric in the best possible appearance. It is recommended that each section of fabric be groomed as it is completed, and if practical, again after drying. The professional cleaner *should* test their grooming technique on an inconspicuous area before grooming the entire piece.

5.3.12 Evaporation and Ventilation of Solvents

Dry solvents leave aerosolized vapors in the work area. After dry cleaning, the evaporation of solvents *should* be expedited by using air flow, ventilation, and exhaust. Special attention *should* be given to rinsing non-volatile solvent spotters with volatile solvents (multiple applications may be needed).

The professional cleaner *should* try to leave minimal dry solvents in fabrics before leaving the job site.

The professional cleaner *should* continue to ensure proper ventilation from the work area and minimize cross-contamination of adjacent areas. Failure to exhaust dry solvent vapors may result in exceeding flammability and exposure limits.

5.4 Dry Compound Cleaning Method

The dry compound method is a minimum moisture system used to clean moisture-sensitive or non-colorfast fabrics. Following dry soil removal (e.g., vacuuming), a dry compound consisting of a granular carrier (e.g., cellulose or polymer-based) that has been saturated with cleaning agents *should* be uniformly distributed (i.e., sprinkled) onto the soiled fabric. The cleaning compound attracts soil, during which time the carrier absorbs or adsorbs suspended soil. Dry vacuuming *should* be performed to remove the carrier and the soil absorbed by or attached to it.

5.4.1 Dry Soil Removal

Dry soil removal *should* take place before the application of cleaning agents. Refer to *Section 2.1 Principle 1: Dry Particulate Soil Removal* for more information.

5.4.2 Soil Suspension

Soil suspension fundamentals *should* be applied. Refer to *Section 2.2 Principle 2: Soil Suspension (Separating Adhered Soil)* for more information. In heavily soiled areas, it may be helpful to apply a suitable preconditioner. However, since the dry compound method focuses on minimum moisture application for fabric safety, on non-colorfast fabrics, in particular, preconditioning may not be advisable.

5.4.2.1 Chemical Action

Chemical action may be accomplished in one or two phases:

Preconditioning

Use of a preconditioner containing dry solvents for emulsifying oily soils is recommended on heavily soiled fabrics. Preconditioners and spotting agents *should* be applied to heavily soiled or stained areas before the application of the dry compound. If overspray of preconditioner comes in contact with finished wood, it *should* be wiped off immediately.

Dry Compound Application

In normal soiling situations, chemical action is accomplished using a dry compound consisting of a carrier that is cellulose or porous synthetic polymer based. The compound is impregnated with cleaning agents. The manufacturer's directions relating to the application and quantity of dry compound *should* be followed.

5.4.2.2 Heat or Temperature

Heat is generally not a factor. The temperature of a dry compound will approximate that of ambient air in the work area where cleaning is accomplished.

5.4.2.3 Agitation

Uniform distribution of the cleaning agent is accomplished using hand brush agitation. Manufacturer's directions regarding brush selection *should* be followed. Aggressive agitation on delicate fibers (e.g., wool, silk, linen, and some cotton), fabrics (e.g., satin, velvet, flocked), or finishes (e.g., chintz, moiré) *should* be avoided.

5.4.2.4 Time

The dry compound *should* remain in or on the fabric until substantially dry in order for adsorption/absorption and uniform soil suspension to occur.

5.4.3 Soil Removal (Extraction)

Once the dry compound has dissolved suspended and absorbed soils, it *should* be removed or extracted with thorough dry vacuuming. High-efficiency filtering systems (e.g., HEPA and multi-stage filtration systems) *should* be used to prevent the redistribution of extracted carriers and soils into indoor air.

5.4.4 Pile Setting

Pile setting or grooming *should* be accomplished to remove distortion and to produce a uniform fabric appearance on certain pile constructions (e.g., velvets, flocked, and tufted) and some flat-weave fabrics (e.g., brushed cotton). Additional vacuuming may be required.

5.4.5 Drying

The dry compound *should* be vacuumed after it is completely dry. It is anticipated that the dry compound will be dry within 10 to 30 minutes.

5.5 Dry Foam Cleaning Method

Dry foam cleaning is a minimum-moisture cleaning method in which, following dry soil removal (e.g., vacuuming), a dense foam is produced either through agitation by hand, or by a dry foam machine through mechanical aeration of a liquid detergent solution. The foam is distributed by hand or mechanical brush action as the machine moves over the fabric. The foam is then agitated for soil suspension, and the excess foam, along with suspended soil, is extracted by means of a wet vacuum, which is often incorporated into the same machine.

5.5.1 Dry Soil Removal

Dry soil removal *should* take place before the application of the dry foam. Refer to *Section 2.1 Principle 1: Dry Particulate Soil Removal.*

5.5.2 Soil Suspension

Soil suspension fundamentals *should* be applied. Refer to *Section 2.2 Principle 2: Soil Suspension (Separating Adhered Soil)* for more information.

5.5.2.1 Chemical Action

The professional cleaner *should* follow manufacturer label directions to create a properly diluted foam cleaning agent. The solution *should* be whipped or aerated with mechanical or hand agitation into a dense, sudsy foam. Low-moisture foam is designed to avoid dampening the fabric any more than necessary.

5.5.2.2 Heat or Temperature

The temperature of the dry foam is usually the same as that of the ambient air in the cleaning area. Warmer water facilitates the creation of denser foam which may produce more desirable results.

5.5.2.3 Agitation

A natural sponge, hand bonnet, horsehair brush, or rotary power brush designed for fabrics is used to work foam cleaning agents into the fabric for uniform soil suspension. Regardless of the tool chosen, care *should* be taken to avoid over-wetting and uneven moisture application. Excessive agitation *should* be avoided, especially on delicate fibers, weaves (e.g., wool, rayon, satin, velvet, flocked), or fabric finishes (e.g., chintz, moiré).

5.5.2.4 Time

Dry foam shampoo cleaning is a low moisture method; therefore, time is not a significant component and is meant to be kept at a minimum. Extraction *should* take place immediately. Preconditioners *should* not be allowed to dry before soil extraction takes place.

5.5.3 Soil Removal (Extraction)

Suspended soil may be removed through one or more methods.

A wet pick-up vacuum may be used to recover suspended soil and excess foam. A colorfast towel, hand bonnet, or sponge that is absorbent or adsorbent may be used to remove suspended soil and excess foam.

The fabric *should* be left residue-free and pH-neutral as practical. This may be accomplished by lightly misting the neutralizer onto the fabric surface, followed by final wet vacuuming or hand toweling.

After the fabric has dried completely, a dry vacuum may be used to extract crystallized detergent residue and attached soils. When performed by a professional cleaner, high-efficiency filtering systems or systems that exhaust outdoors *should* be used to prevent redistribution of extracted detergent and soils indoors.

5.5.4 Pile Setting or Grooming

Pile setting or grooming *should* be accomplished to remove undesirable distortion and to produce a uniform fabric appearance on certain pile constructions (e.g., velvets, flocked, and tufted) and some flat-weave fabrics (e.g., brushed cotton). It is recommended that each section of fabric be groomed immediately following extraction.

5.5.5 Drying

Due to the risk of shrinkage, cellulosic browning, or dye migration, providing proper ventilation and air movement is recommended to expedite drying. Drying time varies depending on the amount of moisture used in dry foam cleaning, prevailing temperature, and humidity conditions. All fabrics *should* be dried as quickly as practical. Natural fibers or non-colorfast fabrics *should* be dried rapidly, as they may be more prone to problems associated with prolonged drying.

5.6 Encapsulation Cleaning Method

Encapsulation cleaning is a low-moisture cleaning method in which, following dry soil removal (e.g., vacuuming), an encapsulation cleaning agent is applied, gently agitated, and then extracted with an absorbent towel or wet vacuum. Following complete drying, a thorough dry vacuuming is performed to remove encapsulated dry particulates.

5.6.1 Dry Soil Removal

Dry soil removal *should* take place before application of the encapsulation cleaning agent. Refer to *Section 2.1 Principle 1: Dry Particulate Soil Removal.*

5.6.2 Soil Suspension

Soil suspension fundamentals *should* be applied. Refer to *Section 2.2 Principle 2: Soil Suspension (Separating Adhered Soil)* for more information.

5.6.2.1 Chemical Action

The professional cleaner *should* follow manufacturer label directions to create a properly diluted cleaning agent. Encapsulation cleaning is designed to avoid dampening the fabric any more than necessary.

5.6.2.2 Heat or Temperature

The temperature of the encapsulation cleaning agent is usually the same as that of the ambient air in the cleaning area.

5.6.2.3 Agitation

A natural sponge, hand bonnet, horsehair brush, or rotary power brush designed for fabrics may be used to work cleaning agents into the fabric for uniform soil suspension. Regardless of the tool chosen, care *should* be taken to avoid over-wetting and uneven moisture application. Excessive agitation *should* be avoided, especially on delicate fibers, weaves (e.g., wool, rayon, satin, velvet, flocked), or fabric finishes (e.g., chintz, moiré).

5.6.2.4 Time

Encapsulation cleaning is a low-moisture method in which soil suspension and encapsulation may continue as the product dries.

5.6.3 Soil Removal (Extraction)

Suspended soil may be removed through one or more methods.

A wet pick-up vacuum may be used to recover suspended soil and excess encapsulation cleaning agent. A colorfast towel, hand bonnet, or sponge that is absorbent or adsorbent may be used to remove suspended soil and excess encapsulation cleaning agent.

The fabric *should* be left residue-free and pH-neutral as practical. This may be accomplished by lightly misting the neutralizer onto the fabric surface, followed by final wet vacuuming or hand toweling.

After the fabric has dried completely, a dry vacuum is used to extract crystallized detergent residue and attached soils. When performed by a professional cleaner, high-efficiency filtering systems or systems that exhaust outdoors *should* be used to prevent redistribution of extracted detergent and soils indoors.

5.6.4 Pile Setting or Grooming

Pile setting or grooming *should* be accomplished to remove undesirable distortion and to produce a uniform fabric appearance on certain pile constructions (e.g., velvets, flocked, and tufted) and some flat-weave fabrics (e.g., brushed cotton). It is recommended that each section of fabric be groomed immediately following extraction.

5.6.5 Drying

Due to the risk of shrinkage, cellulosic browning, or dye migration, providing proper ventilation and air movement is recommended to expedite drying. Drying time varies depending on the amount of moisture used in encapsulation cleaning, prevailing temperature, and humidity conditions. All fabrics *should* be dried as quickly as practical. Natural fibers or non-colorfast fabrics *should* be dried rapidly, as they may be more prone to problems associated with prolonged drying.

5.7 Shampoo Cleaning Method

Shampoo cleaning is a method of cleaning in which, following dry soil removal (e.g., vacuuming), a foaming detergent is applied to fabric using sprayers, sponges, hand toweling or mechanical brush action. This method is similar to the Dry Foam Cleaning Method, but typically employs the use of higher levels of moisture. This method may be used on fibers, fabrics, and dye systems that can be wet cleaned safely. In heavily soiled areas following shampoo application, suspended soil and excess moisture are commonly recovered by means of a wet vacuum (i.e., extraction).

5.7.1 Dry Soil Removal

Dry soil removal *should* take place before the application of shampoo agents. Refer to *Section 2.1 Principle 1: Dry Particulate Soil Removal.*

5.7.2 Soil Suspension

Soil suspension fundamentals *should* be applied. Refer to *Section 2.2 Principle 2: Soil Suspension (Separating Adhered Soil)* for more information.

5.7.2.1 Chemical Action

Shampoo *should* be mixed with water in an appropriately sized container, by following product label directions. The fabric *should* be dampened uniformly, without over-wetting filling or padding materials.

5.7.2.2 Heat or Temperature

If fabric and the product label directions allow, shampoo may be mixed with hot water to increase detergent activity.

5.7.2.3 Agitation

To maximize effectiveness and evenly distribute cleaning agents, shampoo *should* be worked into the fabric's surface using a sponge, hand brush, towel, or powered rotary brush agitation. A soft-bristled brush

may be used to avoid excessive agitation on delicate fibers (e.g., wool, silk, linen, and some cotton), fabrics (e.g., satin, velvet, flocked), or fabric finishes (e.g., chintz, moiré).

5.7.2.4 Time

The cleaning agent *should* be given the manufacturer's suggested dwell time before it is removed with wet vacuuming. Heavily soiled colorfast fabrics may benefit from longer dwell time, which gives cleaning agents an opportunity to fully emulsify or suspend soils in heavy-use areas. Preconditioners *should* not be allowed to dry before soil extraction takes place.

The wet shampoo method is likely to leave the fabric in a condition that is usually avoided (i.e., too wet). The professional cleaner *should* always monitor how wet a fabric gets and be prepared to double extract or speed dry.

5.7.3 Soil Removal (Extraction)

Suspended soil and detergent residue *should* be removed with wet-vacuum equipment. To expedite drying, toweling with an adsorbent or absorbent colorfast cloth is recommended. Fabrics *should* be left as residue-free as possible, and pH-neutral or slightly acidic.

5.7.4 Pile Setting or Grooming

Pile setting or grooming *should* be accomplished to remove undesirable distortion and to produce a uniform fabric appearance on certain pile constructions (e.g., velvets, flocked, and tufted) and some flat-weave fabrics (e.g., brushed cotton). If excess moisture is present, toweling of the fabric is recommended before pile setting. It is recommended that each section of fabric be groomed immediately following extraction, and again, if practical, after drying.

5.7.5 Drying

Due to the risk of shrinkage, cellulosic browning, or dye migration, the professional cleaner *should* provide proper air movement and ventilation to expedite drying. Drying time varies depending on the amount of moisture used in shampoo cleaning, and prevailing temperature and humidity conditions. All fabrics *should* be dried as quickly as practical. The professional cleaner *should* dry natural fibers or non-colorfast fabrics rapidly, as they may be more prone to problems associated with prolonged drying.

5.8 Hot Water Extraction (Water Rinse Extraction) Cleaning Method

Water rinse extraction is a cleaning method that begins with dry soil removal (e.g., vacuuming) followed by preconditioning, rinsing, and extraction. The pressurized rinse solution is injected into or flows across the fabric. Suspended soil is removed by combining the flushing action of injected solutions with wet extraction. Excess solution and suspended soil are collected within a wastewater recovery tank or disposal system. This method can be used on a fabric whose fibers, dyes, and construction are not adversely affected by water-based professional cleaners, as long as over-wetting is avoided and thorough wet extraction to remove excess moisture is accomplished.

This method is erroneously referred to as 'steam cleaning,' however, no live steam is employed in the cleaning method, only pressurized rinse water.

5.8.1 Dry Soil Removal

Dry soil removal *should* take place before the application of cleaning agents. Refer to *Section 2.1 Principle 1: Dry Particulate Soil Removal* for more information.

5.8.2 Soil Suspension

Soil suspension fundamentals *should* be applied. Refer to *Section 2.2 Principle 2: Soil Suspension (Separating Adhered Soil)* for more information.

5.8.2.1 Chemical Action

A preconditioning agent *should* be prepared in an appropriate container, following product label directions. A sufficient amount of preconditioner *should* be applied to dampen fabric evenly over the section without over-wetting filling or padding materials.

5.8.2.2 Heat or Temperature

Chemical activity and cleaning efficiency are increased, and surface tension is reduced as cleaning solution temperatures rise.

5.8.2.3 Agitation

To evenly distribute cleaning agents and maximize their effectiveness, preconditioners *should* be worked into heavily soiled or heavy-use areas. Excessive agitation *should* be avoided on delicate fibers (e.g., wool, silk, linen, and some cotton), fabrics (e.g., satin, velvet, flocked), or fabric finishes (e.g., chintz, moiré). The items commonly used for agitation, include but are not limited to:

- soft bristled synthetic brush;
- horsehair brush;
- sponge (natural or synthetic);
- adsorbent (microfiber) or absorbent (cotton terry) towel; and
- hand bonnet, or a gloved hand.

5.8.2.4 Time

Preconditioners *should* be allowed sufficient dwell time to suspend soils before extraction. Preconditioners *should* not be allowed to dry before soil rinsing and extraction takes place.

Caution *should* be exercised on non-colorfast fibers or delicate fabrics where rapid drying is required. In those cases, extraction *should* occur immediately after preconditioner application and distribution.

5.8.3 Soil Removal (Extraction)

Following preconditioning and sufficient dwell time, suspended soil *should* be removed using an injection or extraction machine and an appropriate upholstery cleaning tool. Using this tool, a rinse solution *should* be injected into or flow across the fabric to suspend and flush soils. Soils and excess rinse solution *should* be recovered immediately with a wet vacuum incorporated in the injection or extraction machine. Multiple extraction passes may be required for optimal cleaning, particularly in heavily soiled areas. Variations in water temperature and rinse detergents (if any) may be needed depending on the material being cleaned. This is based on an evaluation of the fabric's colorfastness, fiber content, and construction.

Fabrics *should* be left as residue-free as practical, and pH-neutral or pH appropriate for the fiber and dye type.

5.8.4 Pile Setting or Grooming

Pile setting or grooming *should* be accomplished to remove undesirable distortion and to produce a uniform fabric appearance on certain pile constructions (e.g., velvets, flocked, and tufted) and some flat-weave fabrics (e.g., brushed cotton or chenille). If excess moisture is present, toweling of the fabric is recommended before pile setting. It is recommended that each section of fabric be groomed immediately

following extraction, and again, if practical, after drying. Grooming is important for natural (e.g., cotton, linen, wool) and modified cellulose (e.g., rayon, viscose) fibers, and is part of the cleaning process.

5.8.5 Drying

Drying times vary depending on the amount of moisture remaining in the fabric after cleaning and environmental conditions (e.g., temperature, humidity, and air movement). Fabrics *should* be dried as quickly as practical. The professional cleaner *should* dry natural fibers or non-colorfast fabrics rapidly, as they may be more prone to problems associated with prolonged drying (e.g., cellulosic browning, dye migration, shrinkage, and wicking). Due to these risks, implementing proper environmental controls (e.g., temperature, air movement, and ventilation) is recommended to expedite drying.

5.9 Combination Methods

In many cases, the best results may be achieved with a combination of methods. After testing and evaluating the fabric thoroughly, the decision about which methods are appropriate in combination with one another is left to the judgment of the professional cleaner. Customers *should* be advised of the need for such procedures. It is recommended that a furniture condition report be provided before cleaning commences. Examples of combination methods include but are not limited to:

5.9.1 Dry Solvent/Wet Cleaning

The buildup of oily soiling may be easily and safely emulsified with dry-cleaning solvents. It may be beneficial to dry clean fabric, or portions of a fabric, before wet cleaning. Often the dry-cleaning procedure is limited to body contact areas, such as armrests, seat cushions, inside back, or pillows. Initial dry cleaning may be followed by one of the wet cleaning methods outlined in this standard. Refer to *Sections 5.3 Dry Solvent Cleaning Method and 5.8 Hot Water Extraction (Water Rinse Extraction) Cleaning Method* for more information.

5.9.2 Shampoo and Extraction

In extreme soiling situations, the principles of cleaning may be optimized by first shampooing the materials, and then allowing adequate dwell time for maximum soil suspension. This procedure may be followed by thorough hot water extraction to rinse suspended soils from the fabric. This combination technique maximizes the benefits of agitation, dwell time, and temperature, while ensuring thorough rinsing or extracting of suspended soils and cleaning agents. Refer to *Sections 5.7 Shampoo Cleaning Methods and 5.8 Hot Water Extraction (Water Rinse Extraction) Cleaning Method* for more information.

5.9.3 Vapor Steam (Dry Steam)

Some fabrics cannot be exposed to water without shrinking (e.g., rayon, raw cotton). When cleaning fabrics made of these yarns the cleaner *should* minimize the amount of liquid the fabrics are subject to. This poses a problem for the professional cleaner when the fabric being cleaned is heavily soiled. Typically, vapor steam is used in combination with the shampoo method, even though it may be used as a stand-alone method. The vapor steam is delivered by a steam generator through a wand head and can provide great soil suspension. The wand head of the steam generator is typically covered by an absorbent cloth and as the head crosses the fabric, the soil is transferred to the cloth and leaves the fabric dry.

Cleaners *should* avoid touching the wand head and exercise extreme caution when touching the attached cloth, as they can be extremely hot and cause severe burns.

6 Leather Cleaning

Leather is produced by treating animal hide or skin with tanning agents. The resulting product possesses qualities that are different from those of the original hide or skin. After tanning, the leather may be dyed to the desired color. After the leather is dyed, it may have a finish applied for enhancement and protection. The leather used in upholstery usually comes from cowhides, but other animal skins may be used.

6.1 Leather Identification

The professional cleaner *should* be sufficiently trained to be able to correctly identify the different types of leather and finishes to ensure the leather is treated with the appropriate methods and products.

6.2 Types of Leather

There are many grades of leather used in upholstery. The most common are listed below with a brief description of each.

- Full Grain Leather - utilizes the full thickness of the hide (Common uses include saddlebacks);
- Top Grain Leather - utilizes the uppermost portion of the hide and is called genuine leather (Common uses include high-end handbags, furniture, and jackets);
- Corrected Grain Leather (bottom cut/split) - utilizes leather that has had repair to the hide (Common uses include jackets, handbags, footwear, and furniture);
- Bonded Leather - utilizes leather scraps that are bonded together with a substrate (Common uses include bookbinding, various fashion accessories, and furniture).

6.3 Dyes and Finishes

There are many styles and grades of leather, that are produced with a variety of finishes. The most common styles of leather used in upholstery are listed below with a brief description of each:

- Protected Leathers (e.g., finished, pigmented, pigment coated): these leathers have combined the best aspects of a natural product and technology to create a product that is more uniform in appearance and color. Another form of protected leather is semi-aniline (e.g., micro-pigment augmented with finish). Semi- aniline *should* be treated the same way as protected leathers.

- Aniline Leathers (e.g., unprotected, distressed, naked, unfinished): these leathers have been colored with transparent dyes, which means the actual surface grain markings are still visible. Minimal or no protective treatments are applied. However, the application of wax and oil are topical treatments that are common for these leathers and *should* be identified before cleaning, as special treatments may be required. Wax and oil pull-up are also referred to as distressed leather or semi-alanine leathers.

- Leathers (e.g., chaps, distressed, bomber, shearling, suede): these are leathers that have had the surface buffed to create a soft velvet feel. Nubuck leather is sensitive to wet cleaning and water spotting. Professional cleaners *should* have specialized training in cleaning and texturing nubucks.

- Faux Leather: fabrics that look like leather but are not real leather include but are not limited to:

    - naugahyde – vinyl;
    - pleather – polyurethane film sealed to the fabric substrate;
    - vegan - polyurethane film sealed to various substrates;
        - bi-cast - back side is original back split leather with a polyurethane finish sealed to the surface and encased with a patent leather topcoat;

- bonded leather – small particles of leather adhered to a substrate with a polyurethane film on top; and
- microsuede – also known as microfiber, usually a fabric made from polyester that mimics the appearance of suede or nubuck.

6.4 Pre-Cleaning Inspection and Testing

The professional cleaner *should* always perform a series of tests to determine the leather type, dye system, finish, and level of wear to establish the correct cleaning products and procedures. Testing *should* be performed in areas of non-wear and compared to testing in areas of wear.

The pre-cleaning inspection process for leather *should* include all five of these elements of observation:

1. Visual;
2. Touch;
3. Scratch;
4. Moisture; and
5. Magnification.

Professional cleaners *should* identify aniline and nubuck leathers as they require more care while cleaning. Both aniline and nubuck leather can be scratched with a fingernail, with the affected area changing to a lighter color. These styles of leather are porous with water and oils absorbing easily if protection is not present. Proper leather protection inhibits but does not stop this type of absorption. Anilines and nubucks can start to fade from sunlight with only 300 to 400 hours of UV exposure. Nubuck leather is the hardest to maintain as the nap that is created significantly increases the surface of the leather and its absorption capacity.

6.5 Cleaning Leather Types

When cleaning leather, the professional cleaner's primary concern *should* be removing soil while controlling both pH and cleaning agent application so that the leather and finish are not damaged.

Many manufacturers recommend general leather cleaning solutions that are pH neutral for basic cleaning.

6.5.1 Leather Cleaning Methodology

The leather cleaning methodology *should* follow these steps:

1. pre-inspection and testing;
2. dry soil removal (for suede and nubucks);
3. wet cleaning via soil suspension (CHAT);
4. soil extraction;
5. conditioning;
6. application of protector; and
7. drying.

6.5.2 Regular Maintenance of Protected Leather

Regular maintenance *should* include scheduled cleaning and conditioning of the leather. This *should* be performed at a frequency that is determined by the degree of soiling and the leather's condition. Failure to properly maintain leather may result in staining, loss of color, permanent soiling, and cracking of dyes and finishes.

Professional cleaners *should* enquire about and follow all manufacturer maintenance instructions for the care of their leather product.

In the absence of any specific care instructions, the cleaner *should* recognize the environment in which the leather upholstery item is located (e.g., where it may be exposed to high temperatures or adverse humidities), and recommend a cleaning, conditioning, and protection frequency which takes those conditions into consideration.

Cleaning and conditioning of leather upholstery is recommended as often as quarterly in extremely dry conditions or coastal areas with sea water.

6.5.3 Regular Maintenance of Unprotected Leather

Professional cleaners *should* follow the pre-cleaning inspection process to determine the proper cleaning methodology for leather styles like aniline, nubuck, suede, and distressed leather. Cleaners *should* exercise caution when using specialty cleaning products during the cleaning process to avoid color and texture loss. Cleaners *should* always test all cleaning chemicals in a small inconspicuous spot in both worn and rarely touched areas with a cotton swab or similar before using the product overall. It is recommended that the professional cleaner start testing on a rarely touched area first, then test the worn areas. This procedure provides the information required to determine the state of the leather when it was new compared to the current state and provides the information needed to restore the worn areas to its original condition.

Cleaning agents can be applied to a towel (or sponge) and then wiped across the leather transferring the soil to the towel. When appropriate, the professional cleaner may apply agitation techniques to increase soil suspension followed by soil extraction using a towel.

6.5.4 Deep or Restorative Cleaning

When regular maintenance has not been performed, it is likely that deep or restorative cleaning will be required.

Deep or restorative cleaning of leather requires the use of cleaning solutions and processes that may cause color loss and require immediate repairs. Regularly maintained protected leather rarely requires restorative cleaning. Professional cleaners performing deep cleaning *should* also be prepared to perform restoration repairs. Deep or restorative cleaning will result in more aggressive agitation to distribute the cleaning solutions and suspend the soils. Professional cleaners *should* test worn areas before using aggressive agitation.

The professional cleaner *should* understand that different generations of protected leather have varying degrees of hard coat protection. More recently produced leathers may be less durable due to a lack of hardener in the finish.

6.6 Types of Cleaning Agents

The cleaner *should* begin the cleaning task by using solutions that are pH neutral to avoid damage to the leather finishes, as well as the leather itself. However, in heavy soiling situations, an alkaline cleaner may be the most effective agent to use. The professional cleaner *should* consult with their customers regarding decisions about the aggressiveness of the cleaning process to avoid undesirable results.

6.6.1 Mild Cleaner

A mild cleaner is used as an overall cleaner and will remove most soils on well-maintained leather upholstery. When cleaning aniline and protected leather, (use of) a mild cleaner *should* be attempted prior to progressing to more aggressive cleaning agents.

6.6.2 Strong Cleaner

A strong cleaner has a higher detergency than a mild cleaner and is used for built-up soils on upholstery that has lacked proper maintenance. Strong cleaners *should* be used when mild cleaners have proven ineffective.

It is recommended that strong cleaners be rinsed following application as these cleaning agents can cause color and texture changes.

6.6.3 Degreaser and Poultices

Some oils and perspiration are absorbed into the hide and cannot be surface cleaned. If a mild cleaner or strong cleaner cannot remove these soils, a degreasing process may be required.

Following the use of degreasers, cleaners *should* be prepared to perform restorative repairs. This process is rarely done on-location and can require multiple treatments.

When performing restorative cleaning, poultices can be used as the last step for drawing out oily soils from within the leather hide.

6.6.4 Fat Liquor

Fat liquor restores natural animal fats removed during deep cleaning, degreasing, and restorative cleaning. It is recommended to apply fat liquor after the cleaning processes have been completed.

6.6.5 All-Purpose Stain Remover

General stain removers or all-purpose cleaners are similar to strong cleaners. The formulation of the product varies depending on the manufacturer. This product is used on spots rather than cleaning the entire item with a strong cleaner.

Following the use of stain removers, cleaners *should* be prepared to perform restorative repairs.

6.6.6 Protein Stain Remover

Protein stain removers are specially formulated to deal with protein-based stains originating from animals or humans. These products are formulated to be effective on stains such as milk, eggs, and blood. These stain removers *should* only be used after attempts to clean with mild or strong cleaners have failed.

6.6.7 Ink Stain Remover

Ink stain removers are usually a small stick applicator of dry solvent. Professional cleaners using ink stain removers *should* be prepared to perform restorative repairs as these products may damage the hard coat finish and cause color loss. The cleaner *should* exercise caution when using solvents on alanine leathers.

6.6.8 Mold Stain Remover

Leather is particularly vulnerable to mold growth in high humidity and water damage situations. The professional cleaner *should* try to establish whether they are observing surface mold growth or mold staining on leather upholstery. The cleaner *should* attempt to discern whether the mold growth extends into the backing and frame of the furniture. In such situations, or when in doubt, the professional cleaner *should* refer to the latest edition of *ANSI/IICRC S520 Standard for Professional Mold Remediation* or an Indoor Environmental Professional (IEP).

Regular cleaning methods may not prove effective in removing mold stains from leather. A mold stain remover for leather is a specifically formulated product, used for removing visible fungal staining and may discourage further growth on the surface of leather.

High-value or irreplaceable items of sentimental value may justify cleaning and restoration or preservation using specialized techniques. The professional cleaner *should* advise the client that post-remediation verification be performed by an IEP.

6.6.9 Spew Remover

The cleaner *should* be able to recognize spew verses mold. Spew can be determined by field testing using a hair dryer or lighter. Spew remover resolubilizes the excess fat liquor (spew) allowing it to be absorbed back into the leather.

6.7 Post-Cleaning Procedures

Professional cleaners *should* always condition the leather with an appropriate product and follow the manufacturer's instructions when applicable for the correct product and schedule.

Leather protectors and aniline topcoats are recommended to be applied.

7 Spot and Stain Removal

The professional cleaner *should* make a reasonable attempt to ascertain the origin of spots or stains, how long they have been present, and what removal attempts have been made. Depending on the composition of spots or stains, quick response time and proper cleaning procedures may assist in minimizing the probability of it becoming stubborn or permanent. Professional cleaning of spots and stains will not correct the color loss.

Spots and stains *should* be treated by a professional cleaner who is trained in the process.

The professional cleaner *should* exercise patience when attempting spot and stain removal. Aggressive agitation can damage fabrics. Excessive use of certain spotting agents can result in color loss, color bleeding, browning, watermarks, texture distortion, or loss of fabric integrity. Failure to thoroughly extract some agents may leave soil-attracting residues. These issues can be avoided with patience and knowledge of proper cleaning methods.

7.1 Identifying Spots and Stains

A quick examination of a spot or stain may provide enough information to identify its characteristics.

The professional cleaner *should*:

- ask about the source of the stain. People who live or work in the house or building are most likely to know what caused the stain. A direct and truthful answer is not always available, but the cleaner may obtain useful information;
- ask about previous cleaning attempts;
- examine the texture of the spot on the fabric to help with identification. If there is a substance on the upholstery fabric, it may be felt even through a nitrile glove;
- observe the location and color or lack thereof as an aid in indicating the source of the spot or stain; and
- observe the shape (e.g., round, irregular, splatter).

Appropriate cleaning methods and systems will reduce spilled substances from wicking back after cleaning.

7.2 pH

When a professional cleaner is treating spots or stains, it is recommended that a cleaning agent of the opposite pH be used to enable neutralization of the spot or stain; further rinsing may still be necessary. The pH can be checked with pH testing strips or with an electronic pH meter. pH testing strips *should* not come into direct contact with fabrics.

7.3 Unknown Spots or Stains

If a spot or stain cannot be specifically identified, the professional cleaner *should* attempt to categorize it as either oil-based or water-based, and then treat it accordingly. If the cleaner cannot determine if the spot or stain is oil or water-based, it *should* be treated as if it was oil-based first with a dry solvent before treating it as water-based.

7.4 Basic Spot Removal Procedures

The professional cleaner *should* follow these spot-removal procedures (sequencing may vary):

1. Identify fabric (e.g., natural, synthetic, or blend) and check the label;
2. A thorough dry vacuuming is recommended prior to proceeding with the following steps;

3. Identify the spot or stain. When an exact identification is not possible, the spot or stain *should* be categorized (e.g., water-based, oil-based, organic) to help direct the removal process;
4. Identify if the staining material has penetrated deeper than the upper surface of the fabric. If the spot is on a zippered cushion, this can be observed by opening the zipper and inspecting the cushion and the back of the fabric;
5. Confirm previous cleaning and spotting attempts;
6. Perform a colorfastness test on an inconspicuous area to ensure that fabric is colorfast for spotting agents being used. (e.g., fabric that has been exposed to fabric protector, soiling, or previous spotting attempts may skew test results). Following testing in an inconspicuous area, testing *should* be performed in a body contact area;
7. Use appropriate tools to loosen and physically remove excess soil (e.g., spotting spatula, or blunt knife blade). The professional cleaner *should* use caution to prevent damage to the textile. This may be accomplished by the following, as appropriate:
    - scooping semi-solids (e.g., ketchup, mustard);
    - blotting;
    - vacuuming dry particle materials (e.g., copier toner, graphite); or brushing and vacuuming (e.g., starchy foods, common spills).
8. If the above findings indicate a spot is still wet from a liquid spill (e.g., beverages), apply dry compound, crystalizing shampoo, or rinse extract using an appropriate spotting solution;
9. If the above findings indicate ink, the cleaner *should* use a specially formulated product or solvent designed for this purpose; and
10. To reduce the possibility of wicking, utilize the following techniques, as appropriate:
    - thorough removal of the spot or staining material;
    - avoiding over-wetting and excessive use of spotting solutions;
    - accelerating drying times (e.g., using an air mover);
    - introducing a barrier behind the fabric; and
    - finishing with an absorbent compound or encapsulation agent.

7.5 Testing for Color or Texture Change

Professional cleaners *should* test any spot removal agent as described in *Section 7.4 Basic Spot Removal Procedures (number 5).* The cleaner *should* take the time to be sure that cleaning agents and techniques are effective and safe for the upholstery fabric being cleaned. Damage may occur to the texture of some fabrics or set stains from excess heat during the cleaning and spot removal process.

7.6 Detailed Spotting Techniques

Due to the nature of upholstery fabric construction, performing a “spotting only” process exclusively in the affected area(s) is highly likely to cause watermarks, texture damage, or color loss. It is better to clean the entire article of furniture, however, if this is not possible the cleaner *should* clean the entire affected cushion or panel. If the customer does not wish to have the entire piece cleaned, the cleaner *should* warn them of the potential difference in appearance and document the limitation that has been placed on the procedure.

The professional cleaner *should* follow these steps for spot removal on upholstery:

1. Remove excess and spotting material, (e.g., vacuuming, dry chemical sponge, spotting spatula, or brushes);
2. Apply liquid spotter or dry compound. When using liquid spotters first apply the solution to a clean absorbent towel, then transfer the spotting agent from the towel to the spot. This helps avoid over-application of the spotting agent, which in the case of dry solvents can lead to damage of adhesives or back coatings used to keep the fabric stable;
3. Always work the product into the spot by tamping, rather than scrubbing. Scrubbing can distort delicate upholstery textures, especially with natural fiber fabrics and blends;
4. Use a tapping or tamping motion to gently agitate spotting agents into spots or stains, working gently from the outside toward the center of the spot. In addition, a spatula may be used;

5. Allow dwell time for the chemical agent to work. Blot liquids with a clean, white, absorbent towel or remove the dry compound with a vacuum;
6. The above sequence may be repeated, as long as there is evidence of continual improvement. Exercise caution when using oxidizers and alkaline spotters on cellulosic fibers due to the likelihood of damage or latent damage; and
7. Extract spotting agents and any remaining soil. Rinse non-volatile solvent spotting agents using a volatile dry solvent spotting agent or as directed by manufacturer label instructions.

When appropriate, the professional cleaner may apply an absorbent compound or encapsulation agent to the cleaned area to prevent any potential wicking or re-soiling.

7.7 Spotting Kits

Items recommended for a spotting kit include but not limited to:

- carrier with the following specifications:
  - large enough to hold all cleaning agents and accessories;
  - insulated if transported in a vehicle, and
  - with a closable, secure top to reduce the risk of access by children or pets.
- flip-top spotting bottles;
- undyed absorbent towels and microfiber towels;
- spatulas (e.g., bone, plastic, or metal spatulas, or similar tools);
- tamping brush;
- pH indicator strips or digital pH pen;
- ultraviolet (UV) lamp; and
- penetrating moisture meter.

Products *shall* have legible labels which comply with the authority having jurisdiction (AHJ) in the area of operation. If any part of a product label becomes illegible, then a secondary or workplace label *shall* be affixed. Any spotting agents with child resistant safety caps *shall* have those caps reaffixed after use.

After use, products *should* be returned to their carrier in their original container with their original caps affixed securely for storage and transportation. A spotting kit *should* be kept clean and stocked with fresh cleaning agents.

7.8 Spotting Chemicals

Working with fresh spotters assures the best possible results. Spotting agents *should* be used before the expiration of their shelf life (e.g., oxidizers have a limited shelf life after opening and being exposed to heat or light).

To maximize product stability and longevity, spotting agents *should* be stored in conditions specified by the manufacturer (e.g., cool, and dry storage). Cleaning vans are not optimal for long-term storage due to extreme shifts in temperature and humidity. Containers kept in the cleaning vehicle *should* be regularly refilled with fresh supplies stored according to manufacturer instructions.

7.9 Basic Spotting Agents

The following agents *should* be regular components of a professional spotting kit.

7.9.1 Volatile Dry Solvents (VDSs)

VDSs *should* be used in a well-ventilated area. Volatile means that the solvent evaporates rapidly and completely. VDSs *should* be used to remove residues from NVDSs and some citrus solvents. VDSs are petroleum distillates.

7.9.2 Non-Volatile Dry Solvents (NVDSs)

NVDSs may also be known as paint, oil, and grease remover (POG): NVDSs *should* be removed from the fabric by the application of a VDS or with a dry compound. Due to the thinness of most upholstery fabrics, extreme caution *should* be exercised before making multiple applications of VDS and NVDS solvents. Solvents will rapidly penetrate beneath the fabric and may create lingering odors or deterioration of upholstery back coat, padding, or stuffing. If NVDS is not removed thoroughly, the residue may appear like a "wet spot." NVDSs are petroleum distillates.

7.9.3 Citrus Solvent Gel

This unique type of NVDS is derived from essential oils and solvents found in citrus fruits. This spotter type *should* be used in situations where longer dwell time is required on hardened oil-based spots. Citrus solvents *should* be rinsed after use or removed with a dry compound, as they are not volatile and may attract soil.

7.9.4 Encapsulation Spotter

This type of spotter encapsulates soil so they may be dry vacuumed away. Encapsulation spotters can be used for almost all water-based spotting and is recommended to be used to reduce the risk of wicking.

7.9.5 Dry Compound

This type of material can be used as both a poultice and to loosen and absorb both water and solvent-soluble spills and spots. It may also help to reduce the risk of browning and bleeding.

7.9.6 Alkaline Detergent Spotter (ADS)

This type of product is used to remove spots caused by many food spills and other common household soils. They can be effective for removing protein-based spots and stains, such as blood, chocolate, grass, milk, and egg. The professional cleaner *should* understand that neutralizing ADS with an acid rinse may be necessary to prevent dye issues.

7.9.7 Tannin Spotter

An acid spotter with surfactants, recommended for use in removing tannins which are natural dyes from plants. Tannins are commonly found in fruit juice, wine, coffee, and tea. Tannin spotters may also be useful for treating urine, faeces, watermarks, and as a dye stabilizer.

7.10 Specialty Spot and Stain Removal Products

The following agents often work by producing a chemical reaction, rather than a physical change. Using these products may require additional safety precautions to protect both the professional cleaner and the upholstery. Refer to the latest edition of the *IICRC Safety and Health Field Guide for Professional Cleaners* for more information.

Rust removers are products that chemically change rust stains to make them less visible to the naked eye. The professional cleaner *should* be cautious when applying rust removers to upholstery fabrics. The acidic nature of these products may cause color loss or color changes in the fabric. Rust removers containing extremely hazardous ingredients such as hydrofluoric acid *should* be handled with extreme caution. In addition to the dangers to the cleaner, they may also etch glass or porcelain. The techniques of rinsing and neutralizing *should* be used because of the amount of skin contact that occurs with upholstery fabrics.

Oxidizing agents are products that work by chemically changing the staining agent to a colorless compound.

Oxidizing agents are often referred to as bleaches. They *should* be used only by trained individuals and even then, only after testing for colorfastness. Oxidizers can remove color from some upholstery fabrics. Heat may sometimes be employed to accelerate the action of a mild oxidizer. Oxidizers can corrode metals and degrade natural fibers with concentrated or repeated exposure.

Cleaners *should* not use strong oxidizers on natural fibers or blends with natural cellulosic fibers. Examples of oxidizers used for spot or stain removal include:

- hydrogen peroxide: a clear, self-neutralizing bleach that *should* be kept in tightly capped dark bottles and stored in a cool place, as exposure to heat and air will decrease its effectiveness (3% concentration or lower recommended for natural fibers); and
- sodium perborate and sodium percarbonate: are powdered oxidizers that convert to hydrogen peroxide when mixed with water. This oxidizer *should* be kept dry until ready for use. Hot water activates these agents and releases oxygen which is directed to the staining material. Some formulations may leave a white, powdery residue. It is recommended to use a buffering agent when using powdered oxidizers.

Reducing agents (also known as reducers or strippers) are products that remove oxygen by adding electrons to a dye stain to render it colorless.

Reducing agents can be accelerated by heat or acids. Reducing agents may produce harmful gases often associated with a rotten egg smell, especially when accelerated. For this reason, the cleaner *should* ensure adequate ventilation is provided and proper Personal Protection Equipment (PPE) is donned, especially when accelerating reducing agents. When mixing reducing agents extreme caution *should* be exercised to avoid inhalation of the powder dust. The professional cleaner *should* not mix oxidizers with reducers as they counteract each other and can sometimes create toxic vapors.

Examples of reducing agents include liquid browning treatments, powdered reducing agents, and red stain removers. Active ingredients may include sodium metabisulphite and sodium hydrosulfite (also known as sodium dithionite).

Enzyme digesters are chemicals that break down protein or other organic matter that is insoluble in some detergent solutions. Enzyme digesters are often formulated to target a specific type of organic matter. Cleaners *should* avoid inhaling powdered enzymes. Caution *should* be exercised due to the high pH of some of these products. An acid rinse may be needed following use of the digester.

7.11 Reappearing Spots and Stains (Wicking)

Certain residues that are not visible after cleaning or spotting procedures can cause a spot or soiled area, which exhibits darkening of upholstery face yarns. This can occur almost immediately, within hours, or even days later. The professional cleaner *should* investigate and take measures to deal with potential reappearing spots. Visible water-soluble soils may be removed or rendered invisible, but clear oils are often missed if the spotting agent or process used has no oil removal properties. These oils will attract soil, resulting in rapid re-soiling.

7.11.1 Wicking

Wicking is a residue that results from a substance (e.g., dry, water, or oil-based soils) that has penetrated and remains in the base of the fabric or the material below. Substances which are not completely removed can migrate to the surface in the presence of moisture.

Professional cleaners *should* employ measures to prevent or reduce wicking. These measures may include but are not limited to:

- thorough dry soil removal;
- application of absorbent material (i.e., dry compound, weighted terry towel);

- use of an encapsulating agent;
- thorough moisture extraction;
- use of rinse agents; and
- speed drying.

8 Fabric Protectors

Fabric protectors are materials that enhance the performance of fibers or fabrics by changing their surface energy and making them more soil-retardant and stain-repellant. Fabric protectors are generally fluorochemical-based products suspended in water or a dry solvent solution or silicone-based products in a dry solvent solution. They may be applied to finished fabrics by the textile manufacturer, the furniture dealer, or by a professional cleaner.

Depending on the type, fabric protector's bond with, or coat fibers to form an invisible barrier against water-based and oil-based stains. Some fabric protectors may also provide resistance to soil particulates. Fabric protectors work by lowering the surface tension of fibers so that the surface tension of the stain is greater than that of the fibers or fabric. This difference in surface tension minimizes stain penetration and soil adhesion and allows most soil and stains to be removed easily. The professional cleaner *should* exercise caution when choosing fabric protectors to ensure they do not attract soil.

8.1 Characteristics of Fabric Protectors

Fabric protectors help preserve and protect the appearance of fabric by allowing easier, faster, and more efficient removal of soil, stains, and liquid spills. Fabric protectors generally do not change the appearance or hand of the fabric.

8.1.1 Oil Resistance

In most applications, it is recommended that fabric protectors used on upholstery offer resistance to oily soils. The principle is that when soil is deposited on fabrics, it adheres to fabric protection rather than to individual fibers. Silicone-based protectors protect against water-based stains and provide no oil resistance.

8.1.2 Stain Release

Fabric protectors can provide good stain-release performance. When solid or liquid spills occur, the protection keeps the stain on the surface of the fibers. Quick attention to spills and stains results in a much higher likelihood of complete removal.

8.1.3 Water and Liquid Repellency

The invisible barrier created by the fabric protectors provides good water and liquid repellency whether the protection is silicone or fluorochemical-based. When proper routine maintenance is performed, most protectors, and especially the fluorochemical-based products, are highly effective in preventing both water and oil-based liquid spills and prevent dry soil buildup, as well.

8.2 Fabric Protector Application

Professional cleaners *should apply fabric protectors* according to product label directions. Over-application of fabric protectors may adversely affect fabric appearance, "hand," or texture, and can attract soils. Before applying fabric protectors, the professional cleaner *should* understand the label instructions for correct use and review the Safety Data Sheet (SDS) as required.

Before applying a fabric protector, all pre-inspection procedures covered in *Section 4 Pre-Cleaning and Post-Cleaning Inspections (Administrative Procedures) should* be completed.

8.2.2 Colorfastness

Before any fabric protector applications, the fabric colorfastness *should* be tested in an inconspicuous area with the product intended for use. If color transfers to a clean white cloth or from one portion of the fabric

to another during testing, that protector has the potential to damage the fabric's color, and the professional cleaner *should* reconsider use of the product on the fabric.

8.3 Cleaning and Care of Upholstery Treated with Fabric Protector

Fabric protectors are designed with cleaning and repellency in mind. If the protector is correctly applied, consumers can remove most spot and stain materials easily if discovered early and treated properly. Even with proper protector application, upholstery *should* be vacuumed regularly to ensure that dust and soil do not accumulate and hinder the performance of the fabric protector.

When a spot or staining material is set in, professional cleaning services are usually necessary to restore fabric performance. Fabric protector reapplication is recommended following cleaning.

This standard, details a number of cleaning methods, depending upon fiber and fabric type. All the cleaning methods outlined in this standard are compatible with fabric protection, if IICRC maintenance and cleaning guidelines are followed. Refer to *Section 5 Methods and Systems of Cleaning* for more information.

9 Residential vs. Commercial Maintenance and Cleaning

Regardless of what kind of fabric is being cleaned, the professional cleaner *should* follow the standard of care in both residential and commercial settings. This section outlines characteristics inherent to either cleaning scenario that the cleaner *should* be able to anticipate and be prepared for.

9.1 Commercial Upholstery Cleaning Processes

Cleaning upholstery in commercial and office environments presents its own unique challenges. The professional cleaner *should* pay special attention to the following:

- workstation set up and impact on staff in surrounding work areas;
- pre-existing flame-retardant treatments, and relevant AHJ requirements regarding re-application;
- returning office chairs to their original place;
- security and access concerns;
- water access and disposal; and
- proximity of computer, telecommunication, and electric cords.

Subject	Residential	Commercial
Fiber type	Cotton, linen, polyester, olefin, acrylic, nylon, wool, silk, rayon. Frequently blends of the above fibers. Natural fibers *should* be identified.	Nylon and Polyester are prominent. Wool is used in larger spaces. Blends possible. Cellulose fibers are rare.
Weaves	Plain, twill, satin, dobby, jacquard. Durability varies greatly. Care *should* be taken with flocked and knitted products.	Plain weaves are the norm. Flocks do exist. Durability is typically high.
Effects	Novelty yarns found regularly. Air-entangled yarns also used for the effect. Blends of fiber types often account for different styling effects.	Blends of fiber types often account for different styling effects.
Finishes and protectors	Sizing, chintz, or glazes are sometimes applied. Proprietary factor finishes are common. Fabric protection after-sprays for soil and stain retardance are commonly applied. Flame retardants often present.	Proprietary factory finishes are common. Fabric protection after-sprays for soil and stain retardance are commonly applied. Flame retardants often present.
Typical soil types (in addition to dry soils)	Body oils and hand marks, sunscreen and lotions, perspiration, airborne cooking oils, food spills.	Hand marks, food spills, ground in dirt.
Spots and stains	Household foods and beverages, pen and marker inks, pet stains.	Food and beverages, ink. (medical may include body fluids)
Upholstered items requiring cleaning	Sofas, chairs, ottomans, dining room chairs, headboards, draperies, wall coverings, pillows.	Office chairs, office and desk partitions, wall coverings.
Cleaning methods	Hot water extraction (HWE), Shampoo, dry powder, dry solvent.	Hot water extraction (HWE), encapsulation, dry powder, vapor steam
Idiosyncrasies	More susceptible to color loss or migration, and shrinkage. Can suffer from cellulosic browning. Buttons used more frequently (rust potential).	Partitions installed over metal can rust; recommend low moisture cleaning or speed drying. Wear and tearing more prevalent, especially on arms, folds, and seat cushions. Cushions frequently lack zippers. Since a test swatch may not be available, it is recommended to obtain fiber content, when possible.

Table 1: Considerations for Residential vs. Commercial Upholstery Cleaning

10 Safety and Health

This Standard has not been written to address work-related safety and health practices associated with performing upholstery and fabric cleaning. Professional cleaners and cleaning companies *shall* understand and adhere to all applicable health and safety regulations related to the country or locale in which they work. Examples of subjects addressed by regulatory requirements in upholstery cleaning can include, but are not limited to:

- hazard/risk assessments;
- fire prevention plans;
- personal protective equipment;
- respiratory protection programs;
- bloodborne pathogen exposure control plans;
- written hazard communication programs;
- hearing conservation plans; and
- working surfaces (e.g., floors, ladders, scaffolds).

Federal safety and health regulations in the United States that can impact the employees of a cleaning business include, but are not limited to the Occupational Safety and Health Administration (OSHA) Standards found in Title 29 of the Code of Federal Regulations (CFR) parts 1910 and 1926:

- 29 CFR 1910 – General Industry Standards
- 29 CFR 1926 – Construction Industry Standards

Cleaning companies in the United States *shall* comply with applicable sections of both the OSHA General Industry Standards and the Construction Industry Standards. Furthermore, the AHJ can have additional safety and health requirements that are more restrictive than the Federal Occupational Safety and Health Act. Each state in the United States is required to use Federal OSHA as a minimum statutory requirement, but many states impose even more protections. Employers *shall* comply with these safety and health regulatory requirements.

For more information on how to develop safety plans on the bullet list above please refer to the latest edition of the *IICRC Field Guide for Safety and Health for Professional Cleaners* for more information.

11 Limitations, Complexities, Complications, and Conflicts

Professional cleaners may face many conditions that present numerous challenges produced by limitations, complexities, complications, or conflicts. Professional cleaners *should* have a thorough understanding of these issues and communicate them to all appropriate parties. A definition for each of these challenges follows:

11.1 Limitations

For purposes of this Standard, a "limitation" is a restriction placed by others upon a professional cleaner that results in a limit on the scope of work, documentation, or data collection that can affect the conclusiveness or clarity of the of the project at hand.

Limitations are restrictions that are placed upon cleaners by another party that result in a limit on the scope of work that can affect the outcome of the cleaning process or post cleaning, which may include but are not necessarily limited to:

- taking pictures of certain areas or items that are not allowed due to restrictions from an involved party;
- Inspection, sample collection, or pre-cleaning testing are prevented from being performed;
- removing a step or portion of the cleaning process; and
- insufficient cleaning or drying capability.

Only the hiring party or their representative can impose limitations on the cleaning project. If an attempt to impose a limitation is initiated by any other materially interested party, the commissioning party *should* be advised. Limitations *should* be defined in writing. Limitations placed on any project that are inconsistent with this Standard can result in a conflict.

11.2 Complexities

For the purposes of this Standard, "complexity" is any condition that causes the project to become more difficult or detailed but does not prevent the cleaning from being adequately performed. Complexities can include but are not limited to:

- inconvenient or limited parking and or cleaning areas;
- limited access to furniture or history of the items to be cleaned;
- pre or post normal business hours;
- the inspection site becomes an issue due to building-specific uses, (e.g., school, bank, hospital, or public building, construction site); and
- weather or environmental conditions that might affect accessibility.

11.3 Complications

For the purpose of this Standard, a "complication" is generally any condition that arises after the start of the cleaning and causes or necessitates a change in the scope of the cleaning. Complications can include but are not limited to:

- issues pointed out by the manufacturer;
- cleaning or attempts thereof have already been performed; and
- repairs have already been performed or evidence of the issue is no longer apparent.

11.4 Conflicts

For purpose of this Standard, a “conflict” is a limitation, complexity, or complication that results in a disagreement between parties involved about how the cleaning, documentation, and data collection is to be performed or if the presence of legal counsel is required.

Before beginning the inspection and cleaning, known limitations and complexities, and their consequences *should* be understood, discussed, and approved in writing by the cleaner and materially interested parties. A discussion of each of these challenges follows.

When conflicts develop or limitations are placed on the cleaner by materially interested parties, which prevent compliance with this Standard, the cleaners are expected to stop work until conflicts are resolved. No matter what the outcome, conflicts *should* be documented in writing as to the cause and how they were resolved. Conflicts include but are not limited to:

- customer declining to pay for the services performed because the desired results were not obtained;
- opposing legal counsel prevent tests required to determine cause; and
- involved parties disagree on who is responsible for paying for the inspection and cleaning.

References

The IICRC S300 Consensus Body provides the following list of documents, publications, and other source materials that were considered in the preparation of this Standard. By reference herein, the S300 Consensus Body does not warrant the accuracy or applicability of these documents. Each document is listed because one or more elements of each were influential in the development of this Standard. All cited references are subject to revision, and those using this Standard *should* reference the most recent editions.

Ajoy K. Sarkar (Author); Ingrid Johnson (Author); Phyllis G. Tortora (Author) *Fairchild's Dictionary of Textiles*, 9th Edition (November 4, 2021)

American Association of Textile Chemists and Colorists (AATCC), Erika Simmons, AATCC Technical Director, *Technical Manual of the American Association of Textile Chemists and Colorists*, Research Triangle Park, NC, USA, 2020.

ANSI/IICRC S100 Standard for Professional Cleaning of Textile Floor Coverings, Seventh Edition, Institute of Inspection, Cleaning and Restoration Certification, Inc. (2021).

Bishop, L J., and Linden, C. *Upholstery and Fabric Cleaning*. Clean Care Restoration Academy, Inc., Panama City, FL (2017).

Bishop, Lanier J., *Specialized Fabric Spotting*. Clean Care Seminars, Inc., Dothan, AL, 1984 (revised 2017)

Bishop, Lanier J., *The Cleaning, Restoration, Inspection, and Safety (CRIS) Glossary*. Clean Care Academy (Revised 2016)

Casarett & Doull's Toxicology: The Basic Science of Poisons, 9th Edition by Curtis D. Klaassen, PhD, DABT, ATS, FAASLD, McGraw-Hill Education, New York, 2019.

Dictionary of Leather Terminology, Leather Industries of America, 1991.

Dictionary of Textile Terms (8th Edition) by Phyllis G. Tortora, Ingrid Johnson, Dan River, Inc., New York, NY. (September 17,2013)

Groseclose, Aaron, *Leather and Suede Upholstery Cleaning, Part I,* The Rug Cleaning Specialist, September 18, 1998.

Kumar, V., Abbas, A. K., & Aster, J. C. (Eds.). (April 11, 2017). *Robbins Basic Pathology* (10th Edition.). Elsevier.

McDonnell, Gerald E., and Joyce Hansen, *Disinfection, Sterilization, and Preservation*, Sixth Edition, LWW (August 12, 2020).

Seymour S. Block (1983) *Disinfection, Sterilization, and Preservation,* (3rd Edition), Lea & Febiger

OSHA 29 CFR 1910.119, *Process Safety Management of Highly Hazardous Chemicals -- Compliance Guidelines and Enforcement Procedures,* OSHA Instruction CPL 2-2.45A CH-1 (September 13, 1994)

WoolSafe Fibre Care Specialist Course Training Manual – 2014, The WoolSafe Organisation, West Yorkshire, UK.

IICRC S300 Standard and Reference Guide for Professional Upholstery Cleaning, First Edition (2000) Institute of Inspection, Cleaning and Restoration Certification, Inc.