

Disaster Restoration Study Guide

The purpose of this study guide is to familiarize you with the basic technical and procedural terms used in IICRC approved Disaster Restoration Course. Don't put it aside! Study these terms carefully and you'll greatly increase the knowledge you'll gain from the course, while making the optional IICRC Exam offered following the course much faster and easier to take.

Restoration Alternatives:

1. **Clean** - Remove soil that's foreign to the construction of the surface or material - least expensive option.
2. **Resurface** - Provide a new surface to replace the old one (refinish, repaint, reupholster, etc.).
3. **Replace** - provide a new item or an item of comparable value; may be subject to depreciation.

Value Determination:

1. **Real value** - present market value; may be subject to depreciation.
2. **Sentimental value** - subjective or personal value; generally not insurable.
3. **Appreciated value** - antique or artistic value.

Restorer Responsibilities: (Test carefully before stating restoration capabilities.)

1. Preserve the fabric or surface being restored.
2. Clean within the limits of the situation presented; not perfection.
3. Provide reasonable work for realistic prices.

Fire and Smoke Soiling:

1. **Definition** - Soot is the product of incomplete combustion (PIC).
2. **Components** - Soot residue consists of *carbon particles*, and *oxides of nitrogen* (burning organic compounds) which, when combined with moisture, produce nitric acid.
3. **Degree of residue** is determined by:
 - a. **materials** burned (wood, plastics, etc.; use respirator, ventilation to prevent breathing particles)
 - b. **time** of combustion (more time, more soot generated)
 - c. **temperature** (increases combustion, expands surface pores)
 - d. **temp differential** (smoke attracted to cool surfaces)
4. **Damage increases when:**
 - a. hot oily residues dry rapidly forming a **lacquer-like film**
 - b. acids attack finish or surfaces causing **yellowing** (particularly painted or plastic surfaces)
 - c. moisture combines with finishes turning them **white**

Disaster Restoration Chemicals:

1. **General Purpose Detergent** - general cleaning of furnishings, walls and other structural surfaces.
2. **Heavy-duty Detergent** - durable surfaces; presoak for dishes; salvage cleaning.
3. **Dry Cleaning Sponge** - removes particulate soot from lampshades, latex paint, delicate surfaces.
4. **Glass Cleaner** - windows, light fixtures and chrome appliances.
5. **Wood Polishes** - rejuvenates finished wood.
6. **Metal Cleaner/polish** - tarnished metal surfaces, such as brass, silver, chrome, etc.
7. **Dishwashing Detergent** - mild, free rinsing detergent for dishes and immersible items.
8. **Powdered Abrasive Cleanser** - bathrooms and some salvage cleaning situations (dishes, glassware).
9. **Acid "Cleaner"** - last resort for stone, mortar and grout (use *skin protection*, fresh air *ventilation*)
10. **Wood Cream Restorer** - cleaning/deodorizing/polishing *finished* wood furniture.
11. **Carpet and Upholstery Cleaners** - preconditioners, rinse detergents for synthetic, natural fibers.
12. **Dry Solvent Cleaning Compounds** - precons, rinse agents, detergents, deodorants for drapery cleaning, or lightly soiled upholstery fabrics. Eliminates *distortion*, *dye migration*, *browning*, *shrinkage*.
13. **Pressure Washing Compounds** - general pressure cleaner and tar, asphalt and graffiti remover.
14. **Ceiling cleaners** - eliminates yellowing that remains after soot removal.
15. **Bleach** - chlorine or peroxide to remove "smoke graying" on durable, colorfast fabrics.

*Deodorants Available:

1. **Deodorant Blocks, Gels** - used to "reodorize" an area during and following "real" odor removal.
2. **Deodorant Granules** - absorbs malodor or fluids.
3. **General Purpose Deodorant** - additive to cleaning compounds.
4. **Heavy-duty Deodorant** - direct spray application to odor sources and for fogging airspace.
5. **Dry Solvent Based Deodorant** - thermal fogging, direct application, polish additive.
6. **EPA-registered disinfectant** - quaternary ammonium chloride based. Caution: cationic (+ charge) bactericide/fungicide* that voids stain-resist carpet warranty
7. **Carpet Sanitizer** - anionic (- charge) bacteriostat/fungistat**; won't void stain-resist carpet warranty.
8. **Enzyme Deodorant** - digests severe protein odor.
9. ****Ozone Gas (O₃)** - oxidizes (chemically burns) organic odor.

**Most restoration deodorants contain both masking and pairing agents. **Suffix "-cide" = kill; "-stat" = control.*

***Caution: chemical-sensitive clients may require special cleaning/deodorizing techniques.*

Safety: Always use a proper respirator when spraying or fogging any chemical or gas into the air!

1. **Major Items** - Fire extinguisher; first aid kit
2. **Personal Protective Equipment (PPE)** - gloves, splash goggles, respirator, protective clothing, hard hat, high-efficiency particle arrestance (HEPA) air scrubbers (99% of particles down to 0.3 microns)
3. **Printed Materials** - MSDS on each chemical used; hazardous spill reporting number; ozone deodorization warning signs

Hazardous Materials (HAZMAT): Before removing materials, consider the presence of HAZMAT.

1. **Asbestos** - common in construction materials before '77. Test suspect materials in a qualified lab.
2. **Lead paint** - common before 1986. Use PPE and HEPA air scrubbers when sanding or scraping.
3. **PCBs** - may be found in older fluorescent light fixtures.
4. **Mold** - grows on organic materials with sufficient moisture and time.

Types of Wall Surfaces:

1. **Painted** - latex or oil-based; dry sponge, then wet clean with circular, overlapping techniques
2. **Paneled** - unfinished, finished, photo-finished; dry sponge, wet clean, polish (work with wood grain)
3. **Covered** - paper (dry clean only), vinyl, cloth, flocked; dry sponge, vacuum or wet clean as possible
4. **Acoustical** - dry clean only; ceiling cleaning compounds as last resort
5. **Plastic** - watch abrasives
6. **Glass** - glass cleaner, lint-free towels
7. **Brick or Stone** - dry clean; wet clean (alkaline); acid "clean" (etch); sand blast as last resort
8. **Masonry** - highly irregular; use mechanical wall cleaning (light pressure washing) techniques

Structural Fixtures:

1. **Doors, frames and hardware** - durable enamel paint or varnish - wet clean
2. **Windows, frames and hardware** - frames first, then glass
3. **Vent outlet covers** - disassemble, clean and reassemble
4. **Light fixtures** - disconnect power (safety), disassemble, clean, reassemble
5. **Bath fixtures and hardware** - porcelain coated metal; fiberglass (neutralize soot before yellowing)
6. **Kitchen cabinets** - exterior (*check finish!*) and interior (unfinished: dry sponge, damp wipe, sand lightly)
7. **Bath vanities** - outside finished, inside unfinished or particle board
8. **Built-in appliances** - exterior, subsurfaces, sides and mounting cavity
9. **Drapery fixtures** - the forgotten fixture!
10. **Decorative trim** - complicates cleaning large flat surfaces (walls, ceilings, etc.)
11. **Ceiling fans**
12. **Bookcases** - unload and clean contents; clean, polish shelving; reload contents
13. **Closets and hardware** - shelving, hanging rods, mounting brackets, etc.
14. **Fireplaces** - vacuum or dry sponge; wet clean alkaline; "clean" (etch) acid; sand blast

Flooring - consider cleaning carpet or vinyl twice (mitigation, completion) to prevent permanent yellowing

Unfinished Areas - Evaluate components (stored items; unfinished wood, insulation, sheet metal); deodorize only (light soot); air wash, deodorize (moderate soot); air wash, deodorize, seal (heavy staining)

Exterior - clean alkaline (bleach as required); acid “clean” (etch surface); sand blast as last resort

HVAC - (puffback, malfunction, smoke infiltration) begin near the outset of the job (respiratory protection), with moderate-to-heavy soot. Clean (or replace) filters, branch runs, trunk lines, mechanical components (subcontract), diffusers.

Soft Furnishings - (upholstery, lamp shades, mattresses, pillows, tapestries); remove dry soil (blow off, vacuum, dry sponge); dry clean (prevents browning, bleeding, texture change, shrinkage), or wet clean (more aggressive) as required; polish trim. Use caution when handling any fabric when removing or cleaning.

Window Treatments - (draperies, sheers, blinds): inspect carefully; dry or wet clean either on-location or in-plant. Wash polyester sheers and rehang before dry to prevent wrinkles. Hand or sonic clean blinds.

Wood Furniture - Inspect carefully (size, components, value, use damage, relation to heat line, interior damage); decide whether to clean (light damage), resurface (destroyed finish, permanent discoloration) or replace. Deodorize with dry solvent deodorants and ozone. When transporting, pad and strap well (secure doors and drawers), don't allow surface-to-surface contact; never stack during storage.

Appliances - Restore power to refrigerators/freezers to prevent spoilage. Inspect carefully (finish: painted or porcelain), relation to heat line. Clean as required; obtain electrical safety check from qualified technician.

Electronics - Don't operate until cleaned, both exterior and interior. Subcontract interior servicing to a qualified technician. Use specialty services subcontractors for expensive or large quantities of electronics.

Dry Cleaning/laundry - Divide clothing into 4 categories: disposables (worn out), immediate needs for each member of family, high-value items (furs, leather, formal wear), routine cleaning (clean ASAP). Use specialty services contractors for unusual items. Deodorize *after* cleaning with ozone, dry solvent deodorant.

Personal Items - Includes closet/drawer/bath vanity contents; personal papers. Evaluate, clean as indicated, convey to insureds for evaluation and/or disposal.

High-value Items - Inspect carefully; determine value before beginning. Options: clean yourself, subcontract locally (museum, art teacher, artist), crate and ship to specialized institution. Always list carefully (insured's description, trade name, serial number); protect (corrosion control, exterior cleaning, packing).

Kitchenware - (dishes, utensils, pots) Inspect carefully for preexisting damage, heat damage, hairline cracks, discoloration. Clean carefully: pad work surfaces, presoak, hand clean, final wash/rinse, wrap and pack with clean newsprint.

Books - Evaluate and inspect (construction, warped pages, soot staining); clean with dry sponging, wet clean covers, abrade page edges (eraser, light sanding). Deodorize with ozone and thermal fogging.

General Principles Relating to Odor:

1. **Human Nose** - the only odor detection device.
2. **Types of Odor** - **real** and **heightened awareness** (psychological)
3. **Humidity** - Odor is amplified by temperature and humidity (moisture)
4. **Smoke Particle Size** - **mass median diameter** (MMD) of smoke odor particle is **0.1-4 microns**.
5. **"Overkill"** - the key to successful, permanent deodorizing

Basic Procedures for Total Odor Removal:

1. **Source Removal** - Remove primary source (debris, contamination, char, items or surfaces).
2. **Clean** - Clean all surfaces exposed to significant contaminant
3. **Recreate the Conditions of Penetration** with appropriate odor counteractant.
4. **Seal** - Coat or seal salvageable surfaces with stain sealer as required.

Deodorizing Concepts - Agents Available:

1. **Masking** - Perfumes or fragrances that cover a bad odor with a stronger, more pleasant odor.
2. **Absorbing** - Using highly absorbent compounds to attract moisture or malodor residue.
3. **Pairing** - Combining chemical deodorant with airborne malodor to form a new, non-odorous compound.
4. **Disinfecting (Sanitizing)** - Use of chemicals that kill (disinfect) or control (sanitize) bacteria and fungi that create odor on surfaces or materials.
5. **Digesting** - Using enzymes to digest protein based odor (milk, blood, egg, fish, feces).
6. **Oxidizing** - Using chemical or gas to cause oxidation reaction (chemical burning); destroys organic malodor.
7. **Sealing** - Encapsulating a malodor by coating a surface.

Deodorizing Equipment:

1. **Syringe and Needle** - For injecting deodorant into fabrics.
2. **Pump (hand or electric) Sprayer** - direct application of liquid deodorants onto surfaces.
3. **Smoke Ejector** - clearing toxic gases or contaminants from structures.
4. **Power Blower** - blowing off contamination, and pressurizing and injecting deodorant into wall spaces.
5. **Standard Wet Fogger** - cold fogging of water based deodorants into airspace using droplets in the 15 micron MMD range.
6. **ULV Fogger** - cold fogging water-based deodorants into airspace using 8-15 MMD droplets
7. **Thermal Fogger** - hot fogging dry solvent based deodorants into airspace using ½ micron droplets
8. **Ozone Generator** - electrically powered unit that produces oxidizing gas, ozone (O₃).

Study emphasis pages: 11, 13, 14, 16, 19, 20, 26, 28, 35, 39, 40, 42, 44, 46, 52, 53, 54, 55

Questions: Call the sponsoring school or instructor with whom you registered.