

## Study Guide – Fire/Smoke Restoration Technician (FSRT)

This study guide is provided to you to complement the lecture and hands-on learning environment of the FSRT courses. Please use this guide to become familiar prior to class with terms and basic information. When combining this pre-course study guide with classroom instruction and homework assignments, your exam should be easier with higher retention.

### Deodorization principles:

- **Remove** the source, as possible
- **Clean** contamination from surfaces
- **Recreate** the **conditions** of **penetration** with appropriate counteractants
- **Seal (encapsulate)**, if required

### General Deodorization:

- **Detection device** – nose (“sniffometer”)
- **Types of odors:** - real and heightened awareness (“psychological”)
- **Amplification of odors:** - temperature and humidity
- **Particle size** – smoke - .01 – 4 micron; nicotine – 0.01 – 1 micron
- **Combination methods** – usually, the best process to remove odors

### Restoration Alternative options:

- Clean – least expensive; remove soot (soil) foreign to structural material or personal property
- Resurface – less expensive than replacement; painting, refinishing, reupholstering
- Replace – generally, most expensive; replaces unsalvageable items with new or refurbished item

### Determined values:

- Real – value if purchased or replace
- Appreciated (antique) – value set by market place; requires specific insurance coverage
- Sentimental – value cannot be replaced by restorer; value from feeling, rather than reason

### Restoration chemicals:

- dry cleaning sponge – walls, ceilings; delicate materials; loose soot; not oil-based paint or soot
- absorbent compound cleaner – books, wallpaper, artwork
- general purpose cleaner – mild alkaline cleaner, usually less than 10 pH; moderate soot levels – wood furniture and structural materials
- heavy duty cleaner (degreaser) – higher pH cleaner, usually 10-12 pH; baked-on soot; durable contents and surfaces; presoak for dishes
- glass cleaners; metal cleaners, polishes; dish detergents; powdered-abrasive cleaners\
- acid ‘cleaners’ – tile grout; aluminum surfaces; requires air flow, proper PPE
- textile/upholstery cleaners – preconditioners; rinse agents; acidic agents; low-moisture; solvent
- chlorine bleach – removes color from nylon; dissolves protein fibers; corrodes metals

## Deodorization agents:

- Masking – pleasant fragrance; “odorizer”; time-release agents; oils, gels, solids, blocks
- Sorbing – **abs**orbent – draws odors “into”; **ads**orbent – draws odors “onto”
- Pairing – combines with malodor to produce non-odorous substance; combined with masking agents
- Disinfectant – (bactericides, biocides, germicides) – destroys odors caused by microorganisms
  - “-cide” – suffix meaning to “kill”
  - “-stat” – suffix meaning to “limit or control” growth
- Digester (enzyme) – digests protein odors (blood, milk, egg, urine, meat, bodily fluid)
- Oxidizers – (hydrogen peroxide, sodium hypochlorite) – destroys odors
- Oxidizing gas – (ozone) – destroys odors through ozone O<sub>3</sub> – permanent odor removal
- Odor diffusion – (e.g., Vaportek) – safe, natural, essential oils

## Deodorization equipment:

- Wet foggers – water-based agents (tri-jet 20-50 microns) and (ULV – 8-15 microns)
- Dry solvent fogger (hot fogger; hand-held or gasoline-powered) – solvent-based (.5-2 microns)
- Vapor diffusers – safe, natural and essential oils (molecular size)
- Ozone generator – electric-powered creating ozone (molecular size)

**Loss mitigation** – safety hazards; board-up; winterization; corrosion control; soot neutralization; document

**Safety considerations** – structural; gases; electrical; microbial; BBP;

**Chemical sensitive** – agreed-upon, customer-approved agents; customers remain out of work area

**HAZMAT** - safety hazards; lead paint; asbestos (friable, asbestos-containing material; stop work – liability)

**Methods of wall and ceiling cleaning** (Clean for aesthetics; Clean to Prepare for Paint)

- Dry soot removal only (dry sponge; light washing)
- Dry soot removal; damp clean in small areas (dry sponge; duster; light cleaning)
- Dry soot removal; damp clean overall (dry sponge; wash materials; inspect to proceed, if needed)
- Dry soot removal; aggressive damp clean; prepare to seal and paint (salvage cleaning)

**Material surfaces** (cleaning concerns):

- Painted – flat – dry sponge, light wet cleaning; glossy, oil – more aggressive wet cleaning available
- Texture (stipple) – matching concerns; penetration of soot – highly porous
- Acoustical texture (blown, popcorn) – dissolve in water-based cleaners; age – asbestos?;
- Acoustical tiles – porous; dry methods only
- Suspended (track system) – porous stains, odors; track staining; previous staining; bleaching agents?

**Wall (ceiling) types:**

- **Painted** - flat – dry sponge, light wet cleaning; glossy, oil – more aggressive wet cleaning available
- **Paneling** – unfinished – staining probable, dry methods; finished – more aggressive wet cleaning; mobile homes – printed pattern surface may remove with cleaning
- **Wallpaper** – non-coated (cellulose) – dry methods only; vinyl – water-based cleaning available; flocked velvet – no solvents; grasscloth – staining from soot and heat, no water-based cleaning agents,
- **Wall partitions** – wet cleanable; yellowing probable
- **Plastic (‘fake’ tile, backsplash)** – no solvents or powdered-abrasive cleaners used; yellows quickly

- **Masonry** – porous; grout staining; pre-existing concerns (Mechanical wall washing techniques):
  - Clean with dry method (sponge, vacuum)
  - Clean with alkaline detergent (low pressure spray; agitate; wait until completely dry-inspect)
  - Clean with acid cleaner (phosphoric; muriatic) – ETCH surface – inspect
  - Media blast (sand; soda; dry-ice; sponge) – Last resort; consider subcontract
- **Fixtures** – (doors, windows, trim) – usually, easily cleanable; check relation to heat line
- **Lighting** – turn off power – safety; delicacy; spotting; acid pitting of brass/metals; height/access; ceiling fan concerns – light colored (white), cane (wicker), may require disassembling due to odors
- **Bath fixtures** – porcelain (easily cleanable); fiberglass (stains, scratches) – use non-abrasive cleaner
- **Cabinetry** – (kitchen, vanity, bookcase) – concerns – pre-existing finish damage, blistering, damage; interior – consider light sanding, sealing with stain sealer; rejuvenate with oil-based polish/deodorant
- **Hard flooring** – vinyl – stains; finish loss; wood – light damage – mild water-based cleaning, moderate damage – screen and coat; heavy heat/soot damage – sand, stain, finish, partial or full replacement; laminate – light cleaning or replacement; masonry (stone, marble, concrete)
- **Unfinished areas** – (attic; crawlspace) contents; unfinished wood; temperature extremes; insulation - staining; potential microbial growth; usually, limited heat damage if insulated by drywall/plaster
- **Exterior** – masonry – pressure wash, alkaline detergents; etch with acid cleaner – muriatic acid; media blast; pre-existing damages – rot, mold, stains
- **HVAC** – (puff-back – malfunction of a fuel-oil heating system) – concerns – soot contamination, even if system on or not due to temperature differential and magnetization; available power; type soot residues; clean as close to outset of job as possible; cleaning of ductwork per NADCA guidelines
- **Upholstery/fabrics** – responsibility to preserve the surface while removing soot residue and odors; perform proper pre-inspection, dry soil removal, determine cleaning method (dry solvent, low-moisture, hot water extraction, dry-wet-dry, salvage) based upon inspection; customer communications
- **Soft furnishings** – (lamp shades, mattress/box springs, tapestries, area rugs) – proper inspection, delicate fabric construction, consider relation to heat line; if non-colorfast - dry cleaned; residual odors
- **Window fabrics** – (drapery, sheers, cornice boards, swags, custom, stock size) consider relation to heat line; pre-existing conditions – uneven hanging, weak fabric, heavy soils, sagging; dry clean or washable; in-plant or on-location
- **Blinds** – (vinyl, aluminum, wooden, fabrics, wood, faux wood, shades) determine cleaning cost vs. replacement cost; methods – dry soil removal only; hand-wash bath; ultrasonic bath
- **Wood furniture** – Inspect...Document – (size, complexity, construction, value, use damage, smoke and heat damage, interior damage); Restoration options (clean and polish; light refinish – wood restoring cream; refinishing); Deodorization options (water-based agents; dry solvent-based; ozone; combination)
- **Appliances** – finishes (molded plastic; porcelain; enamel paint); concerns – relation to heat line, yellowing enamel, warped gaskets from heat, melted plastics; was it running at time of fire
- **Electronics** – cleaned by qualified trained technicians; salvable computers, after inspection, cleaned with de-ionized solutions; computer concerns – immediate needs, sensitive data, data retrieval
- **Clothing** – (dry cleaning or laundering) – pressurized soot/odors into closets and drawers; separate into categories (disposables, immediate needs, high-value items, routine cleaning); dispose of coat hangers; deodorization treatment after cleaning; subcontract as needed
- **Toys** – if cost effective, clean with hand wash or ultrasonic bath; dry quickly; sanitize toys
- **High-value items** – thorough inspection and documentation; (jewelry; firearms; artwork; figurines; collectibles); if possible, obtain value in writing; detailed analysis and detailed pictures

- **Kitchen items** – (fine china, crystal ware, dishware, silver, pots/pans) – inspect carefully for hairline cracks (stress cracks, caused by rapid cooling after heating – heavy soot covering cracks); hand cleaning in padded sink – fine china, crystal, painting or metal trim is present; ultrasonic cleaning – expedites job, may require pretreatment with oil-break prior to cleaning in ultrasonic bath; food – dispose of open boxes, exposed food with soot residues, dispose of heat damaged cans – inspect; inventory
- **Books** – options (clean; rebind; replace) – requires heavy deodorization treatment; sublimation (freeze-drying) if sanitary water source – subcontract, start freezing within 48 hours

**Pack out services** – “types” (**complete**; **limited** – partial damage to structure, high liability items moved out; **selective** pack out – only selective items moved out due to specialized expert, or needing immediate attention, security concerns, primarily on-location cleaning project)

- **Loading and transport** – do not allow surface-to-surface contact; use adequate amount of moving pads/blankets; “strap” (tie down) items to help eliminate shifting during transport; take out and stack drawers/doors, secure against wall of truck or other furnishings
- **Storage** – adequate insurance; climate-controlled facility; proper security; easy access to furnishings; protection from resoiling; boxes, crates, bins; pest control services

**Special emphasis pages in manual:**

**11, 12, 14-15, 16-17, 19-20, 25, 41, 46-47, 49, 53-55, 61, 69, 70-71, 72-73**