

# Dental Facilities

## Best Management Practices For Hazardous Materials/Waste Handling

(Updated July 2016)

Best Management Practices (BMPs) should be thought of as “good housekeeping” procedures. In dental facilities, you may have waste streams regulated as hazardous waste by federal and state laws. Many of these waste streams could be considered nonhazardous if properly recycled instead of disposed of in the trash or down the drain. Listed below are typical waste streams, along with procedures to help you comply with these regulations and help reduce the liabilities associated with noncompliance.

### **Silver Recovery:**

Depending on the locations of facilities and the pre-treatment requirements, you may be allowed to dispose of the photo processing liquid waste stream into the sanitary sewer. Silver is the regulated element in this waste stream and can be removed and sold. Below are some guidance suggestions for your use in determining BMPs for the facility. Each facility's needs will depend on location and amounts processed each day.

### **Generation Sources:**

- Silver is the element used as the light-sensitizing agent in most photographic materials and is present in photographic fixer solutions as silver thiosulfate complex.
- During the developing process, silver is released in the fixer and the bleach/fix. In addition, silver is also present in the wash water as a result of “drag off” from the different processing tanks.
- The concentration and distribution of silver in the photo processing solutions depends on the type of photo processing system used, method of collection, type of wash and the amount of film processed per day.

### **Disposal Options:**

Eventually, the solutions must be replaced and used solutions must be disposed of.

- One method of disposal for the used solution is to store the used solutions in Department of Transportation (DOT) approved containers and then have them hauled away by a licensed commercial hazardous waste hauler.
- Another possible disposal method is to discharge the solutions to a POTW (Publicly Owned Treatment Works) also known as the sanitary sewer system. If the film processor elects to discharge the “waste” chemicals to a POTW, they must be treated to reduce the silver content prior to discharge.

**It is required that you receive written permission from your POTW's “pretreatment officer” to discharge this type of waste stream.** The pretreatment officer will approve or disapprove your request based on silver content of the waste, their operational permit requirements and the plant's capacity for this type of waste stream.

- Discharges to a septic system will require approval from the Lee County Health Department and may **not** be attainable. This type of disposal is not recommended because of the potential to contaminate onsite property and because these chemicals may destroy the biological process necessary for septic tanks to continue effective operation.
- All records for disposal or recycling must be kept on site for three years.

## Processing Chemicals and Washes

Waste fixers, system cleaners, low flow washes, and washless stabilizers may be hazardous due to heavy metals or organic chemicals they contain. For example, waste fixers and stabilizers may contain hazardous levels of silver. Prior to disposal, determine whether waste fluids are hazardous. Please read the Safety Data Sheets (SDS) [formerly Material Safety Data Sheets (MSDS)] to help in this determination.

## Solvents

Common solvents used for cleaning film, work surfaces, and equipment may contain hazardous substances. For example, film cleaners may contain trichloroethylene, a listed hazardous waste, or they may be hazardous due to flammability, having a flash point of less than 140 degrees Fahrenheit.

## Photographic Film

Undeveloped photographic film contains high concentrations of silver. Before disposing of undeveloped film waste, take the proper steps to remove the silver from the film. Film ends and tabs can be soaked in waste fixer to remove the silver from the film before disposal.

Black and white film and x-rays do contain residual levels of silver after developing. Before disposing of these negatives, contact a film recycling contractor for reclamation of the residual silver and the film.

## Silver Recovery Units

Two popular methods of silver recovery produce wastes and effluents that are hazardous. Wastes sent to a contractor for reclamation or recycling are exempt from hazardous waste regulations. It is important to properly maintain silver recovery units.

**Electrolytic recovery units** cause silver to collect in electrolytic cathodes. The silver can be recycled and the desilvered fixer can generally be discharged to a sewer or reused. Obtain written notification from your sewer authority before discharging desilvered fixer. Care must be taken to prevent the formation of sulfides. Silver concentrations in the effluent may be high.

**Metallic replacement or chemical replacement cartridges** form a silver sludge that may be reclaimed. Silver concentrations in the effluent are high unless two units are in series.

## Wastewater

Waste processing chemicals and washes or wastewaters from metal recovery units should never be discharged to the ground or to a septic tank system. Waste processing chemicals, wastewater, etc. should be discharged only to a sanitary sewer system with written permission from your local sewer authority.

Substances commonly used in photo processing and subject to wastewater regulations include:

- Ammonia
- Silver
- Iron
- Sulfites/Sulfates
- Formaldehyde
- Heavy metals: cadmium, chromium and zinc

Fixers, washless stabilizers, and other silver-rich wastewater should undergo silver recovery before being discharged to a sanitary sewer system. It may be necessary to contract with a licensed photographic waste disposal company to properly dispose of your silver-rich solutions.

### **Lead Foil Packaging:**

The lead foil backing on x-ray film needs to be recycled, not thrown into the trash. If the foil backings are not recycled, they are considered a hazardous waste. Some of the film suppliers will provide a recycling service; you should contact your supplier to explore your options. All records for disposal or recycling must be kept on site for three years.

### **Amalgam:**

Dental amalgams are the silver-colored fillings used to fill cavities. This substance is regulated because it contains the elements Mercury, Silver and Tin. Amalgam comes in different forms: excess amalgam from new fillings, pulled teeth with amalgam fillings, and amalgam traps. All of the types listed above may **NOT** go into the trash and **MUST** be recycled. If you choose not to recycle your scrap dental amalgam, you must comply with all hazardous waste regulations. **All records for disposal or recycling must be kept on site for three years.**

### **Disinfectant waste:**

Most of the solvent waste generated at dental facilities comes from disinfecting or cleaning instruments or working areas. Depending on the concentration of the solution you are using, the waste may be hazardous. Reading the Safety Data Sheet for your disinfectant will determine your disposal method. If the waste is hazardous, it must be captured in a container that is sealed so no evaporation occurs and treated as hazardous waste. All records for disposal or recycling must be kept on site for three years.

### **Fluorescent Bulbs:**

Fluorescent bulbs/devices are considered hazardous waste because they contain the heavy metal **mercury**. However, if you recycle under the Universal Waste Regulations, fluorescent bulbs/devices do not qualify as hazardous waste. Please call the Pollution Prevention (P<sup>2</sup>) Program for a list of fluorescent bulb recyclers and handling instructions. Caution: if a supplier tells you that their bulbs are environmentally safe, remember that they are trying to sell you a product, and that they may not be familiar with the State and Local regulations that pertain to the proper recycling or disposal of these mercury-containing bulbs. **Lamps or devices with any mercury must be recycled following the Universal Waste Regulations or disposed of following hazardous waste regulations.** Please refer to the Management of Spent Mercury-Containing Lamps and Devices handout for further details.

**\*Safety Data Sheets** are a good start to determine if your waste stream will be hazardous waste. They do have their limitations if they are too vague. The SDS does not take into account what process or system the product may be used in or what your management practices are for preventing cross contamination. Before purchasing any product, request the SDS to see what is in it and to help avoid costs associated with the purchase, use and disposal of the product.

### **Do Not's**

**Do not** store any materials/waste near storm drains, ditches, creeks, rivers, canals, or any bodies of water that would be contaminated if a spill occurs.

**Do not** throw away, or send to a bookkeeper, receipts that show proper disposal of waste materials. They are required to remain on site for a minimum of three years. This includes contracts with hazardous waste haulers.

**Do not** take the word of any sales person who will not supply the SDS for the product he/she is selling. Some will say that the material is biodegradable or environmentally friendly, but the process that you use the material in may contaminate the product and cause it all to be regulated (i.e., equipment degreasing and rinsing).

**Do not** dispose of any material into your septic system, sanitary sewer, or storm sewer. If you want to do this you must have written permission from the regulatory agency that permits that particular system. For Septic Systems this is the Department of Health; for Sanitary Sewers it is the local utility district in which your facility is located.

**Do not** store hazardous waste out of containment areas. Make sure all containers are properly labeled (include dates where necessary).

**Do not** hesitate to ask questions when it comes to managing your hazardous waste streams.

If you have any questions, please call the Division of Natural Resources Management, Pollution Prevention (P<sup>2</sup>) Program at (239) 533-8821.

STATE OF FLORIDA

# Best Management Practices for Scrap Dental Amalgam Guidelines for Dental Offices

**amalgam** (ah-mal'gam) an alloy of two or more metals, one of which is mercury. **dental**, an amalgam of silver, tin, and mercury ( $\text{Ag}_3\text{Sn} + \text{Hg}$ ) with low concentrations of copper and sometimes zinc; used for filling cavities in teeth.

**mercury** (mer'ku-re) a metallic element, liquid at ordinary temperatures; quicksilver. Its symbol is Hg; atomic number, 80; atomic weight, 200.59; specific gravity, 13.546. It is insoluble in ordinary solvents.\*

*\* Dorland's Illustrated Medical Dictionary*

## Best Management Practices for Scrap Dental Amalgam

In June 2001, the Florida Department of Environmental Protection (DEP) and Department of Health (DOH), in cooperation with the Florida Dental Association (FDA), together completed the development of guidelines for the recycling of scrap amalgam in dental offices. These voluntary guidelines were developed to help dental offices handle and recycle the mercury in amalgams used for dental restorations in compliance with applicable environmental, biomedical, occupational health and transportation regulations. **The DEP has determined that, as of August 2001, compliance with these voluntary management practices will also constitute compliance with DEP, DOH, FL DOT and US OSHA regulations that apply to scrap dental amalgam. If you choose not to manage scrap dental amalgam in accordance with these voluntary management practices, it is your responsibility to assure that your facility operates in compliance with all regulations.**

For detailed hazardous and biomedical waste disposal requirements, refer to appropriate DEP, DOH and Occupational Safety and Health Administration (OSHA) publications. Refer to Department of Transportation (USDOT) regulations for detailed shipping requirements.

According to DEP studies, sources of mercury in dental offices include scrap amalgam, fluorescent lamps, and mercury thermostats. Monitoring/analytical lamps, water-bath thermometers and sphygmomanometers also may contain mercury. Because most dental offices don't produce more than 220 pounds of scrap amalgam, x-ray fixer solution and lead foil from x-ray film (combined) per month, they are regulated as conditionally exempt small quantity generators (CESQG) by DEP.

It is important to develop scrap amalgam guidelines to ensure that mercury is not released into the environment. So, its reclamation is extremely important for environmental and health-safety reasons. By keeping scrap amalgam separate from other waste, it can be reclaimed and recycled. Recycling is done by qualified reclamation companies through a distillation process. The mercury is then reused in new products, including dental amalgam.

For detailed supporting regulatory documentation and more information about the best management practices for scrap dental amalgam, call DEP at (850) 488-0300 or visit the DEP Web site ([www.dep.state.fl.us](http://www.dep.state.fl.us)).



# Best Management Practices for Scrap Dental Amalgam

## Sources of Scrap Dental Amalgam from Operations

There are three sources of scrap amalgam from dental operations:

- **Excess** amalgam which is mixed, but not used; **damaged** capsules.
- Amalgam **from the operatory**. This can be unused mixed amalgam or amalgam retrieved from operatory **drain traps**. Amalgam from operatory drain traps can be handled as scrap amalgam as long as the traps contain little or no tissue.
- Amalgam contained in **extracted teeth**. Extracted teeth that have no amalgam would be regulated as medical waste and cannot be placed in the same container as extracted teeth with amalgam.

## Handling of Scrap Amalgam

1. **Marked Container:** Place scrap amalgam from all three sources into a “sharps type” container (as defined by OSHA) that is initially marked “Biohazardous.” To differentiate from biomedical waste which is placed in a red bag or container, the scrap amalgam container should be a different color (silver). A “sharps type” container may be supplied by the recycler or reclamation facility.
2. **Decontaminate:** When the container is full or ready for shipment, add enough 1:10 bleach:water solution to cover the scrap amalgam in the container. This ensures that the scrap amalgam has been decontaminated per OSHA. To ensure that the decontamination solution strength does not dissipate over time, do not add the solution until the container is full or ready for shipment.
3. **Label:** Cover the “Biohazardous” marking on the container with a label reading “Scrap amalgam decontaminated with 1:10 bleach: water solution on (month/day/year).” This ensures that the full residence time of the scrap amalgam (including extracted teeth with amalgam) is documented on the container label.

## Shipping Scrap Amalgam

Follow these requirements when shipping scrap amalgam to a mercury reclamation facility:

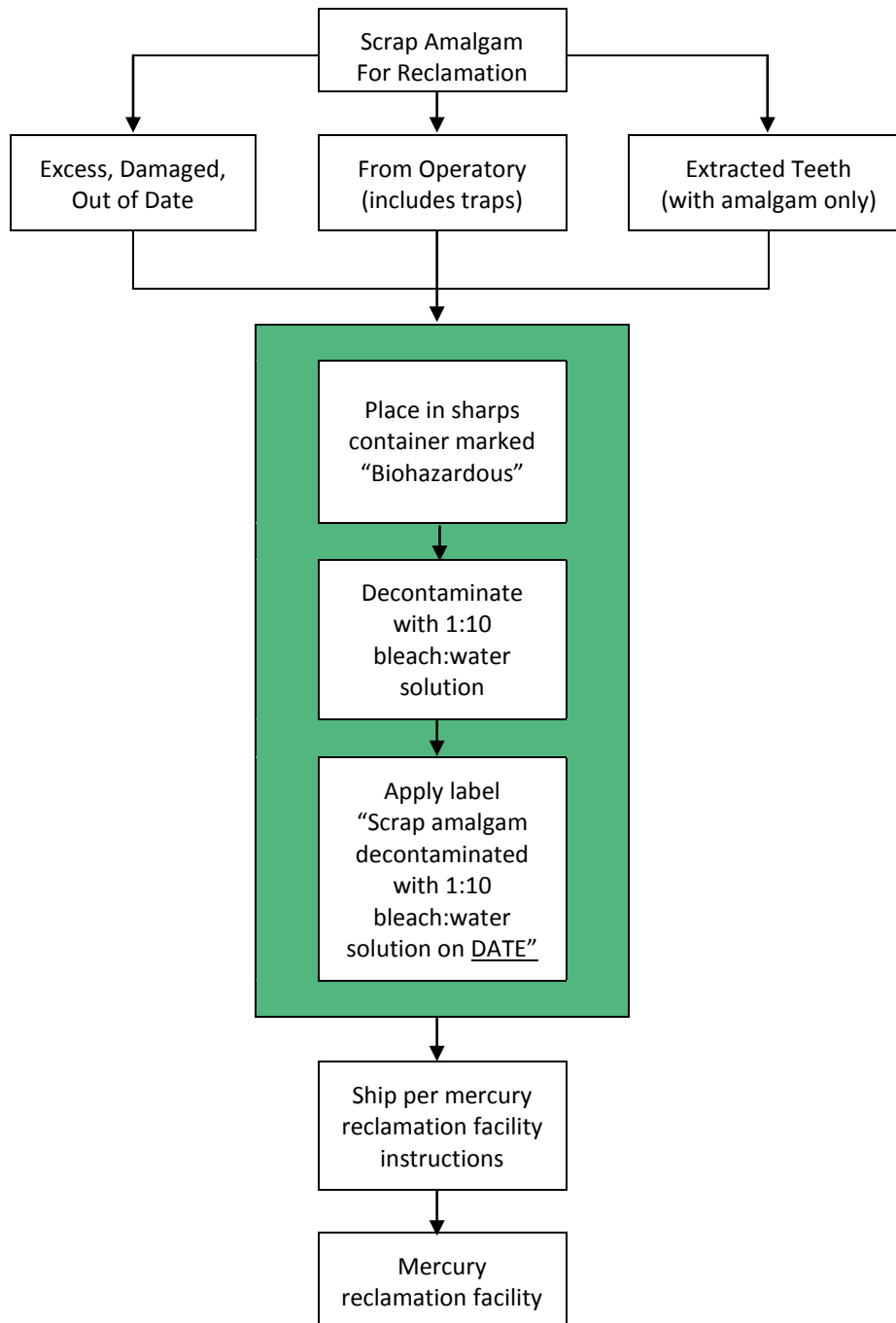
1. Dental offices that ship **less than two pounds** of scrap amalgam (one pound of mercury) per container are not required to meet any DOT regulations.
2. **Written records**, including the name and address of the dental office shipping the scrap amalgam, the amount shipped, the date of the shipment and the name and address of the reclamation facility receiving the shipment, must be retained for three years.
3. If the shipping container contains **two pounds or more** of scrap amalgam (one pound of mercury), it is regulated as a DOT Class 9 hazardous substance. In this case, a mercury reclamation facility should provide the needed documentation to meet all necessary DOT shipping requirements.

## Reclamation Facilities

The Florida Department of Environmental Protection maintains a list of in-state and out-of-state mercury reclamation facilities that currently receive scrap amalgam and that have been investigated by the DEP to verify proper management of scrap amalgam, including proper management of the mercury. Call the DEP at (850) 488-0300 or visit the DEP Web site for the list.

## The Dos and Don'ts of Scrap Amalgam Management

- Do keep amalgam usage for each restoration to the smallest amount necessary for the procedure.
- Do use precapsulated dental amalgam only.
- Do use disposable amalgam traps if practical.
- Do sterilize reusable amalgam traps if disposable are not appropriate for your practice facility.
- Do install at least two filters on the vacuum pumps.
- Do change the vacuum pump filters at least **once** a month.
- Do keep written records of your generation and disposal of scrap amalgam.
- Do recycle all elemental mercury and amalgam.
- Do store amalgam in a container with an air tight fitting lid.
- Do label scrap amalgam containers with your name, address and phone number and the date.
- Do disassemble and clean the amalgamator on a regular basis.
- Do properly seal all amalgam capsules before amalgamation.
- Do reassemble capsules immediately after dispensing the amalgam.
- Do determine if your dental office is a conditionally exempt small-quantity generator.
- Do select a recycler that meets all federal and state regulations for the reclamation of amalgam waste.
- Do place mercury spill kits in convenient locations for easy access in your dental office.
- Do hold training sessions and develop written procedures to ensure that all dental-office personnel know the proper techniques for handling and using mercury; how to immediately cleanup a mercury spill; and how to manage scrap amalgam. Don't rinse amalgam traps over drains or sinks.
- Don't discard amalgam, extracted teeth containing amalgam or amalgam traps into the garbage, red bags or sharps containers.
- Don't handle mercury or mix amalgam in a carpeted area.
- Don't use a regular vacuum cleaner to clean up a mercury spill.



## Contact information

Florida Department of Environmental Protection  
 (850) 488-0300  
[www.dep.state.fl.us/waste/categories/mercury](http://www.dep.state.fl.us/waste/categories/mercury)

Florida Department of Health  
 (850) 245-4277 • [www.doh.state.fl.us](http://www.doh.state.fl.us)

Florida Dental Association  
 (800) 877-9922 / (850) 681-3629  
[www.floridadental.org](http://www.floridadental.org)

Occupational Safety and Health Administration  
 Region 4 Office – Atlanta  
 (404) 562-2300 • [www.osha.gov](http://www.osha.gov)

U. S. Department of Transportation  
 (800) 467-4922 • [www.hazmat.dot.gov](http://www.hazmat.dot.gov)

## DENTAL AMALGAM RECYCLERS LIST

Solely as service to the public and businesses, the Florida Department of Environmental Protection (DEP) maintains the following list of companies that have been reviewed by the DEP. These dental amalgam recycling facilities separate the metal-containing components from the organic material so the mercury and silver can be reclaimed. Metals reclamation facilities reclaim commercial grade mercury and silver from dental amalgam. The information was obtained from the DEP's permitting files, other states' environmental agencies, or voluntarily supplied by the companies and is not necessarily a complete list of available services. A company's absence from the list does not imply prejudice or impropriety. The DEP does not endorse specific equipment or companies. The DEP, by providing this list, does not imply that the companies are in compliance with applicable laws. Users of this list are responsible for ensuring that the products, equipment, or services comply with the requirements of local, state, and federal law. The DEP cautions users to personally evaluate the services and compliance status of any company they use. The list is updated periodically and subject to change without notice. The DEP welcomes information from other companies who wish to have their services or stewardship programs listed.

**Bethlehem Apparatus Co.**  
**Jerry Odenwelder, Tech Sales Manager**  
**(610)838-7034**  
**FAX (610) 838-6333**  
**[www.bethlehemapparatus.com](http://www.bethlehemapparatus.com)**

**Mercury Waste Solutions**  
**Customer Service**  
**Toll Free: (800) 741-3343**  
**(414) 878-2599**  
**FAX (414) 878-2699**  
**[www.mwsi.com](http://www.mwsi.com)**

**\*AERC.com, Inc (MTI)**  
**Laurie Chase, Account Representative**  
**Toll Free: (800) 808-4684**  
**(407) 952-1516**  
**FAX (407) 952-1060**  
**[www.aercmti.com](http://www.aercmti.com)**

**\*ONYX (Superior Social Services)**  
**Mike Berens, FL Regional Sales**  
**Toll Free: (800) 556-5267**  
**(850) 878-2259**  
**FAX (850) 878-3349**  
**[www.superiorserv.com/aboutframe.htm](http://www.superiorserv.com/aboutframe.htm)**

\*Florida Permitted Mercury Recovery and Reclamation Facility

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