

Waste Reduction Methods for Production Painting Operations



Ecology Fact Sheet

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Painting is an important part of many different industries in Washington State. Because paints are expensive, reducing their waste can bring significant savings. Most waste reduction methods for painting operations pay for themselves quickly. In some cases, they can also reduce compliance costs and worker health risks, lower insurance and labor costs, improve community relations and reduce air emissions.

This fact sheet summarizes waste reduction measures already being used in industrial painting operations. The Department of Ecology also has waste reduction staff in your area who are familiar with your industry and are available to provide free technical assistance. They can provide more detailed information on the methods discussed here including vendor information, selected literature references, compliance information, case studies and financial analyses. Refer to the phone numbers in this publication to locate trade associations, technical trainers and Internet connections that can provide additional help.



Inventory Management

- ❖ Purchase paint in bulk to reduce the number of paint cans that require disposal. One large container has less surface area for coatings to cling to than smaller containers of equal volume. This wastes less paint. Large bulk containers may also have an added advantage of being returnable.
- ❖ Monitor your inventory whenever possible. Use Just-In-Time inventory management to reduce the amount of coatings that exceed their recommended shelf life. This type of product management also reduces unneeded inventory.
- ❖ Do not accept vendor samples unless the vendor is willing to take back unused product and waste.
- ❖ Reduce the number of different coating types and colors you use.
- ❖ Reuse out-of-date paint as primer, where possible.
- ❖ Return unused paint to the manufacturer if it is not past the expiration date. It may also be possible to donate it to a community group or sell it through an industrial materials exchange service.
- ❖ Dispense the least amount of product that will do the job.
- ❖ Buy paint that will not produce dangerous waste when used.

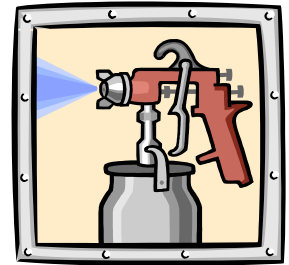
Using Just-In-Time inventory management means you replenish your inventory as you have use for the products.

Job Scheduling

- ❖ Schedule jobs in batches to reduce your number of cleanups.
- ❖ When different colors will be applied on the same day, shoot the lightest colors first then move to the darker colors. Going light to dark uses less solvent for cleanup.

Spray Booths

- ❖ Reduce booth clean up waste and labor by using a spray-on, peel-off booth compound.
- ❖ If operating a water curtain booth, sludge dewatering may reduce waste handling costs.
- ❖ Verify that the booth is properly designed and operated for your needs. Make sure the filters are properly seated.
- ❖ Where appropriate, using 2-stage, high-capacity filters can reduce the volume of filter waste you send for disposal.
- ❖ Maintain paint booths on a regular schedule. Dust or dirt on the floor can ruin a paint job, resulting in additional waste.
- ❖ Equip spray booths with a manometer or magnahelic gauge to measure pressure drop through the filter. Taking this step will help you get the fullest use from each filter.
- ❖ Use the most efficient racking system for your needs. Optimize the hanging density of the parts and their orientation. Adjustable hooks can make this easier.
- ❖ Filters may designate as hazardous waste due to contamination of heavy metals from paints. Eliminating paints with toxic metals such as chromium can make filter wastes less hazardous. Monitoring and frequently replacing filters can also drop them below the designation level.



Solvents

- ❖ Clean equipment immediately, before waste builds up and hardens.
- ❖ Consolidate solvent cleaning operations to reduce losses through centralized cleaning and standardized solvent usage.
- ❖ Let solvent settle and reuse it as a first rinse or flush. Only use virgin solvent for final rinse.
- ❖ Reuse flushing and rinsing solvents for thinning (viscosity adjustment), where appropriate.
- ❖ Dispose of solvent when it loses its cleaning effectiveness, not just because it looks dirty.
- ❖ Consider using a still to recover spent solvents (see Ecology publication #94-31, *On-Site Distillation* for more information).

Air emission standards vary between communities. Check with your local air authority to find out the requirements for your area.

- ❖ Prevent evaporation. Keep solvents in tightly-closed, labeled containers.
- ❖ Paint containers and equipment should be manually scraped (with a spatula) before rinsing with solvent.
- ❖ Automatic gun washers can save money by retaining 90 percent of the solvent and solvent vapors. They also reduce operator labor and exposure to solvent. If you don't have a gun washer, clean spray equipment so that solvent is collected in closed containers.
- ❖ Use equipment that provides pressurized pulses of solvent and compressed air to reduce the amount of solvent needed to clean lines.
- ❖ Segregate solvents to aid recycling (mixed solvents are more difficult to distill). Segregate non-hazardous wastes from those that are hazardous.
- ❖ Use solvent-less mask washers.
- ❖ Control solvent use. Lock up the solvent dispenser, have one person in charge of "handing out" solvent, and set a limit on how much solvent each painter is allowed to have per day.
- ❖ Dedicate a gun and line for frequently-used coatings (e.g., primers, clearcoats) to reduce cleanings frequency and amount of solvent used. Wash solvent then could be re-used for viscosity adjustment.

Separating hazardous and non-hazardous solvents makes them easier to recycle, which saves on disposal costs.

Paint Application Methods

A convenient measure of coating usage is transfer efficiency. Transfer efficiency is the measurement of what percentage of paint actually ends up on the target, as opposed to how much is lost in overspray. The higher the efficiency, the less coating that is wasted.

Factors affecting transfer efficiency include spray equipment type, size and shape of the target, coating type, skill level of the spray operator, air velocity, atomization air pressure, fluid flow rate and fan size. Increasing the transfer efficiency from 30 percent to 65 percent would reduce the amount of paint you use by about 50 percent. Many industries are seeing breakthroughs in the development of high-efficiency paint application techniques for their operations.

- ❖ Consider using electrostatic guns, powdered coatings, and vacuum coating systems for higher transfer efficiency.
- ❖ Use optimum gun settings and spray tips for each job.
- ❖ Use disposable liners for paint containers and spray gun cups to reduce rinsing material waste.

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Operator technique has the greatest impact on transfer efficiency and can cause transfer efficiency to vary by up to 50 percent. In fact, painter skill level can make more difference than the type of equipment used. Training and experience are crucial factors for developing painter skill. Some spray equipment manufacturers provide training videos that you can keep on hand to train new employees or refresh experienced ones. One Washington company periodically videotapes painters in action so they can review their own performance and technique.

- ❖ Use proper overlap of the spray pattern. This depends on the type of coating used.
- ❖ Use the gun speed specified by the manufacturer.
- ❖ Use uniform gun distance from the part to reduce overspray: generally, 6-8 inches for non-electrostatic guns.
- ❖ Hold the gun perpendicular to the surface of the part.
- ❖ Trigger the gun at the beginning and end of each stroke.

Automatic gun washers can save money as well as reduce operator labor and exposure to solvents.

Coatings

- ❖ Stay informed about new coatings developed for your industry. Each year, coating manufacturers devote considerable research to developing formulations that reduce waste, toxicity, and pollution.
- ❖ Mix and use the least amount of coating possible.
- ❖ High-solids and water-based paints can reduce toxic air emissions. Low-solvent paint may cost more, but you may need less to do the job.
- ❖ Consider converting to powder coatings or coatings that are CO2-based, plural component, UV or EB cured.
- ❖ Eliminate the need to paint. When your can, use corrosion inhibitor sprays, conversion coatings, or galvanized metal rather than zinc-rich primers. Use materials that don't require painting.
- ❖ Reuse leftover paint as primer. Give leftover paint to customers for touch-ups.
- ❖ Where possible, thin coatings by using heat rather than solvents.
- ❖ Inspect parts before painting them to prevent painting obvious rejects.
- ❖ Reduce shop towel waste by using stains that don't require hand rubbing.

One Washington wood-coater found that switching from solvent-based lacquer to UV-cured powder coating offered a 2-year payback on the investment.

Paint Rags

Paint and solvent-laden shop towels are often generated by painting operations after hand-rubbing finishes, equipment clean-up, and spills. Many times, disposable wipes must be managed as dangerous waste when contaminated with hazardous substances. Keep hazardous and non-hazardous disposable towels in separate containers. The Department of Ecology encourages the use of shop towels that can be laundered and reused. These towels, when soiled, do not have to be managed as dangerous waste if operators follow certain "best management practices," such as:

- ❖ Wringing extra liquid from soiled shop towels before tossing them into containers. Collect and reuse the liquid, send it to a recycler, or manage it as dangerous waste.

- ❖ Using non-hazardous solvents when possible.
- ❖ Collecting, storing and transporting shop towels contaminated with hazardous substances in closed, properly-labeled containers.
- ❖ Managing containers holding flammable materials according to all local fire department standards.
- ❖ Obtaining reasonable assurance that the recycling facility or laundry you use is meeting local sewer discharge limits and other applicable environmental regulations. This is your responsibility.
- ❖ Accumulating used towels for no more than 180 days before sending them to be recycled.
- ❖ Ecology publication #F-SHW-92-116, *Used Shop Towels* describes additional standards for safe shop towel management.

It is up to the generator to make sure that a recycling facility or laundry meets local sewer limits and other environmental regulations.

Paint Stripping

Consider switching to non-chemical stripping methods such as those that use abrasives or heat. Ecology publication #96-408, *Waste Minimization: A Guide to Solvent Substitutes*, gives an overview and comparison of stripping and cleaning methods. In addition, the Internet resource, *EnviroSense*, provides a wealth of information, case studies and cost analyses for stripping alternatives and solvent substitution (see the resource list).

Paint Waste Disposal

Liquid paint and paint/solvent mixtures may be dangerous wastes because of ignitability, heavy metals content or the presence of toxic solvents. Cured paint found in paint booth filters and sanding dust typically does not designate as a dangerous waste, but it can be tested to make sure.

- ❖ Never evaporate paint or solvent wastes.
- ❖ Never pour them onto the ground or put them into a septic system.
- ❖ Do not send paint, solvents, or paint washwater to the sewer without authorization from your local sewer authority.
- ❖ Never spray waste paint or solvent into the filter banks of spray booths as a means of disposal.
- ❖ Send paints and thinners that are no longer reuseable to a solvent recycler or fuel blender.
- ❖ Always clean up spills promptly. Use absorbent materials, rather than washing down spills or allowing them to evaporate.



Information Resources

Department of Ecology

The Hazardous Waste and Toxics Reduction Program's toxics reduction specialists can provide more information and technical assistance. Call your nearest regional office to obtain information on:

- ✓ Waste reduction methods,
- ✓ Parts cleaning and surface preparation,
- ✓ Paint stripping alternatives,
- ✓ Solvent substitutes, and
- ✓ Vendors and suppliers.

Ask for a hazardous waste specialist if you have questions about staying in compliance with the *Dangerous Waste Regulations*, Chapter 173-303 WAC.

Ecology Regional Office Phone Numbers

*Central Regional Office
(509) 575-2490*

*Eastern Regional Office
(509) 329-3400*

*Northwest Regional Office
(425) 649-7000*

*Southwest Regional Office
(360) 407-6300*

Trade Associations

The following trade associations also provide information:

Puget Sound Paint and Coatings Association c/o Daly's Incorporated, Seattle Contact: Herb Paulson	(206) 633-4200
National Paint and Coatings Association	(202) 462-6272
Chemical Coaters Association Intl	(800) 926-2848
Powder Coating Institute	(800) 988-2628

Training

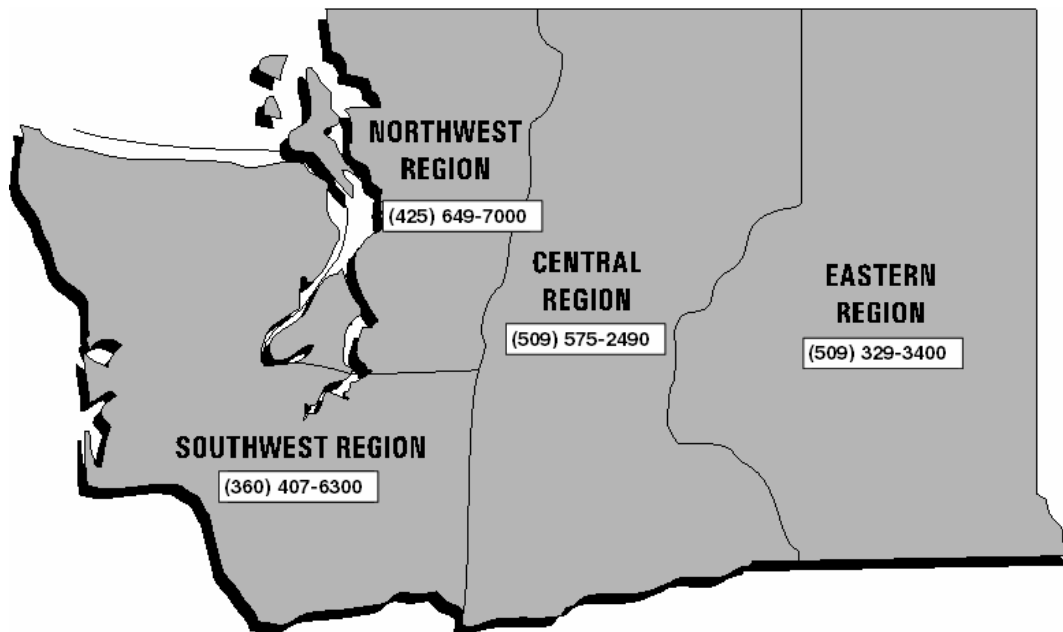
Technician training is available from many resources. The list below is not complete and should not be considered an endorsement. Check the Yellow Pages or trade association newsletters for names of other trainers in your area.

PPG Training Center, Kent	(253) 872-0309
BASF Regional Training	(800) 255-3212 Ext 7275
GRACO Training Videotapes	(800) 690-2894
Iowa Waste Reduction Center Spray Technique Analysis & Research (STAR Program)	(800) 422-3109

Internet/World Wide Web

Excellent technical assistance and waste reduction information is available on the Internet. This information includes technical information, case studies, vendors, solvent substitutes, cleaning and stripping alternatives, trade associations, and much more. If you cannot log on to the Internet, your local library may provide free public access. Helpful Internet addresses include:

EnviroSense	es.epa.gov/
Finishing Industry Home Page	www.finishing.com/
Department of Ecology Home Page	www.ecy.wa.gov
Business Assistance: Paint and Coatings Manufacturing Industry Resources	www.pprc.org/pprc/sbap/painting.html
Thomas Registry of Manufacturers	www.thomasregister.com/



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