



Minimizing Paint Waste



Department of
Toxic Substances Control

Mixing and painting operations are major sources of environmental concerns in the shop and can present some of the greatest pollution prevention opportunities. Taking advantage of opportunities to minimize paint wastes makes sense for your business and for the environment.

Pollution Prevention in Auto Body and Paint Shops, September, 2006

Why Minimize Paint Waste?

Automotive paints are expensive, and so is the cost of managing paint waste. Most paint waste must be managed as hazardous waste.

Efficient paint mixing and application will reduce:

- The amount of paint needed for each job
- Smog forming volatile organic compound (VOC) emissions
- The volume of waste paint that must be managed as hazardous waste
- Paint overspray on the spray booth walls and filters
- Labor, materials, and disposal costs

There are a number of steps where paint waste may occur. By evaluating the painting process from start to finish, you may identify improvement opportunities that will save paint, labor, and money.



Dumping paint in here is the same as throwing money into a drum and paying someone to haul it away.

In the Mixing Room

Manage your inventory

Reduce the need to throw away off-spec materials by planning, knowing your inventory and not overstocking.

- Use next-day or weekly ordering.
- Keep containers closed to reduce evaporation losses.
- Consider installing a mixing bank to keep paints from separating while on the shelf.

Color matching

Perfecting color matches will reduce the need to respray, saving labor and materials.

- Mix in small amounts and spray out on test panels or cards.
- Compare the spray out to the vehicle in natural daylight and inspect the color match from all angles.

- Consider using a hand-held colorimeter or spectrophotometer that can read colors and select a color match from the paint manufacturer's list of formulas.
- Get advice from other painters on difficult color matches.
- Maintain a color library using spray-out test cards to record color variants and tints.

Improve paint measurement and mix only what you need

- Mix on a scale;
- Consider using a computerized mixing system to:
 - track product and VOC usage; and
 - easily generate reports required by the local air district;
- Consider using automated paint dispensers to minimize over-pours.

Track paint use from start to finish and troubleshoot

- Record the estimated amount, the actual amount of paint mixed, and the amount of paint leftover for each job;
- Compare your estimate with the amount of paint used, and then look for ways to reduce leftover paint;
- Compare paint orders with workload.
- Review invoices from paint orders and track from month to month.
- If ordering seems too high, find out why and troubleshoot.

When leftover paint cannot be avoided – tips to reduce waste disposal

- Mix leftover base coat into the ground coat to cover hard-to-hide colors. Use these paints before applying transparent colors, yellow, pink and pearls.
- Check air district rules to make sure mixed coating does not exceed **VOC limits**.
- Use leftover paint for door interiors and edging or jambing
- For popular colors, save mixed paint for later use on jambs or for more coverage under similar base colors.

Minimize paint transfers

Every time paint is poured from one container to another, at least an ounce of paint may stick to the container and be lost. If you generate waste at this step, you may be able to reduce transfer waste with:

- Reusable Teflon mixing cups or
- Disposable paint gun liners.

Disposable calibrated paint gun liners

Using paint gun liners can reduce paint and solvent waste, and provide cost savings. One product, the Paint Preparation System (PPS) (see vendor list), consists of a disposable liner and cap inserted into a reusable plastic shell that attaches to a gravity-fed paint gun. Paint, reducers, hardeners, and other additives are mixed in the liner. Unused paint or primer can be saved in the disposable liner for later use.



Disposable paint cup liners

The benefits of using the paint gun liner system include:

- Paint waste is reduced because it is not transferred from a separate mixing cup,
- Saves time when mixing more than one batch of coating at a time,
- Easier and faster paint gun cleaning,
- Cleaning requires much less solvent and generates less waste, and
- Reduces product purchase and waste disposal costs.



You should consider the following:

- The liners are refillable but cannot be cleaned with solvents for reuse.
- Used liners contribute to your shop's overall waste generation and must be managed properly.

Most shops have found them to be non-hazardous waste. If you are not sure how to manage waste liners, check with your local Certified Unified Program Agency (CUPA).

The Painting Process

Review your shop's painting process for opportunities to improve or fine tune your procedures. Start by reviewing equipment operations.

- Follow the paint and the spray gun manufacturers' instructions,
- Operate spray equipment within regulated pressure limits,
- Follow operating and maintenance procedures for your spray booth and curing equipment.

Improve efficiency and productivity

- When possible, plan primer and clear coat work on multiple cars back-to-back to reduce labor, paint, and solvent waste.
- Consider using tintable primer systems to improve color matches and to get complete coverage with fewer coats.
- Schedule waterborne primer work for the end of the day. The primer is cured and ready for the base coat by the next morning.

Remove the body part from the vehicle before painting

Improve shop efficiency and reduce waste by removing the part from the vehicle before painting whenever possible. Advantages include:

- Eliminating the need for masking;
- Reducing overspray and improving transfer efficiency when parts like hoods and trunks can be oriented perpendicular to the spray gun;
- Streamlining shop processes by moving a car part from one station to the next rather than moving a vehicle.

*Remove part and schedule
like jobs together*



Hands-on training

Slight changes in spray technique can help get more paint on the part and less in the booth filters. Hands-on training from paint manufacturers' training centers and other sources will help improve your spray application technique and transfer efficiency. This will help reduce paint waste and VOC emissions.

Resources For Technique Training And Paint Waste Reduction

Air Resources Board	airtoxics@arb.ca.gov	Automotive Refinishing webpage Coatings
C-CAR Greenlink	(847) 749-4375	Hazardous Material & Safety Training
I-CAR	(800) 422-7872 (847) 749-4375	Training courses
California Auto Body Association	(916) 557-8100 info@calautobody.com	Auto body industry
Iowa Waste Reduction Center (IWRC)	Office Building (319) 273-8905 Painter Training Facility (319) 273-8905	Environmental consulting, assistance, training and education

Upgrade Your Spray Equipment - HVLP

The majority of spray technicians use high velocity low pressure (HVLP) spray guns, but there may be significant differences in performance between manufacturers. When looking at new spray equipment, consider the following:

- Has the spray gun undergone independent testing to verify product claims?
The [U.S. EPA's Environmental Technology Verification program](#) has evaluated a number of spray guns.

For verification reports on HVLP spray guns

- Check trade publications and ask other technicians for performance information.
- Does the gun operate effectively within the required pressure range?
- Can it achieve the required transfer efficiency?
- Is the spray gun approved for use by your local air district?



Newer spray gun technology available on the market today may outperform the HVLP in transfer efficiency, ease of use, and finish quality. Independent tests demonstrated that these technologies can achieve equivalent or better transfer efficiency than HVLP equipment. Several California air districts including the South Coast Air Quality Management District (SCAQMD) have approved these technologies for use in automotive refinishing shops.

Technique and targeting tool

The Iowa Waste Reduction Center (IWRC) developed LaserPaint, a device that attaches to any spray gun, to improve coating application technique and increase transfer efficiency. The device helps the painter to maintain the correct angle and distance, optimize overlap, and reduce overspray. Shops employing painters using the laser targeting device have reduced coating usage by 10% to 40 %, resulting in substantial cost savings.

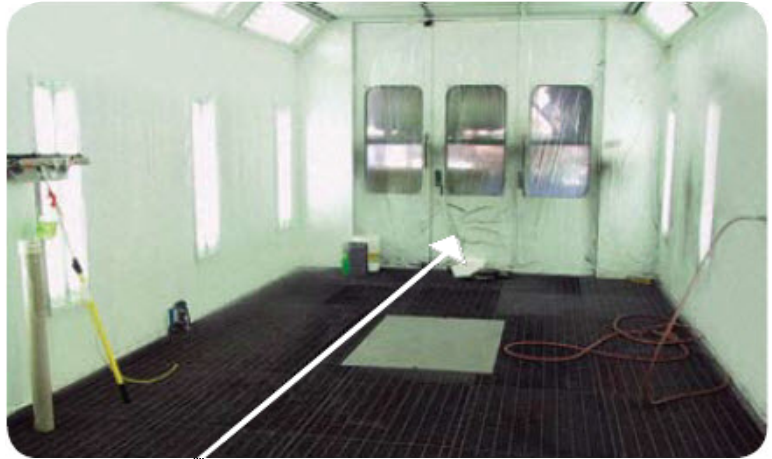
Maintain Your Spray Booth And Components

Routine maintenance of your paint booth will help produce cleaner paint jobs, reduce waste, and protect workers' health. This results in lower labor, operation, and material costs.

Set up a routine maintenance schedule to include the following:

- Change filters
With continual use, intake and exhaust filters get clogged with dirt and paint overspray. Clogged filters can cause poor finish quality and may present a fire hazard. A clean filter helps keep fans clean and air circulating.
 - Check the manometer daily for pressure loss which indicates clogged filters
 - Follow a filter replacement schedule based on calendar or usage hours
 - Use high efficiency filters recommended by the spray booth manufacturer
 - Select filters that are easy to replace
 - Properly manage and dispose of waste spray booth filters. Waste filters may not be hazardous, see the "Hazardous Waste in Auto Body Shops" fact sheet to learn how to make this determination.

- Check fans:
Overspray can build up on fans, reducing airflow away from finish surface and worker. Dirty fan blades can lead to imbalance and wear, possibly damaging the fan.
 - Clean fan blades regularly
 - Follow recommended maintenance schedule
 - Power off unit and lock-out power supply before servicing unit
- Keep the spray booth clean:
 - Everything that enters the spray booth should be as dirt and dust-free as possible for the cleanest finish;
 - Clean booth walls after each job or cover with plastic



Down-draft spray booth

Consider using waterborne paints

Waterborne paint systems have improved in appearance, durability, and longevity over the past 5 years and they continue to improve. Shops in California successfully use waterborne primers and benefit from decreased hazardous waste disposal costs, improved worker health and safety, and improved environmental compliance.

The need to reduce the impacts of VOCs on air quality and the high price of exempt paint additives like Parachlorobenzotrifluoride (PCBTf), will likely result in a shift to waterborne paint systems within the next few years. The ARB adopted a suggested control measure (SCM) that provides a model for air districts when they adopt or amend their rules. The proposed SCM is intended to improve consistency and enforceability of existing rules statewide and may reduce the allowable VOC limits in coatings and paint gun cleaning solvents.

Incentive Programs

Employees can be part of the solution to minimizing waste in the shop by:

- Encouraging employees to conserve materials;
- Asking for their ideas on more efficient use of shop materials, such as paint additives, solvents, masking, and sand paper to reduce direct costs and waste;
- Offering incentives such as bonuses and sharing savings with employees who significantly contribute to waste reduction goals. Substantial cost savings can result from using less materials and generating less waste.



Dave Creech, owner of Quality Body Works in Eureka, distributed more than \$3000 of quarterly incentive bonuses to employees who helped reduce material waste in the shop.

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Vendor List

(Other vendors may provide similar or identical products and services. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying any government approval, endorsement, or recommendation.)

Vendor/Manufacturer & Website Link	Contact Information	Products
3M	The Automotive Markets webpages have a contact form or an option to chat.	Paint Preparation System (PPS)
BASF	Contact webpage	Automotive
DeVilbiss	800-445-3988 Contact Form	Products (spray guns, etc.)
DuPont	800-338-7668 Contact Forms	Automotive
X-Pert	855-632-5997	Dispensers
PPG	800-624-4032	Automotive refinishing
Sherwin-Williams	800-798-5872 Contact Form	Training Courses Color Tools
SATAjet®	800-533-8016 Contact Page/Form	Spray guns

Hazardous Waste Regulatory Requirements

For information on regulatory requirements contact your local CUPA online from [CalEPA's Unified Program website](#) or contact the Department of Toxic Substances Control's [Regulatory Assistance Officers](#) at (800) 728-6942.

To get an EPA ID number, contact:

DTSC

[Hazardous Waste Manifest EPA ID](#) Support Unit

(800) 618-6942



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