



Paint Spray Gun Cleaning



Paint thinner and solvents are commonly used to clean paint guns because of their ability to dissolve paint residue, especially in the small openings of paint guns. The current shop practice is to use solvents in an enclosed automatic gun washer, manually clean the guns, or to use a combination of both manual and automatic cleaning.

Why Be Concerned About Paint Gun Cleaning Solvents?

Paint thinner and solvents are effective for cleaning, but there are significant environmental and health concerns related to their use.

- Solvents contain toxic compounds that present health risks to workers and the community;
- Volatile Organic Compounds (VOC) emissions from solvents contribute to smog formation;
- Emissions are strictly regulated by air districts. Shop operators need to know and follow rules for record keeping, purchase, use, storage, and management of solvent products and resulting waste;
- Paint thinner and acetone are flammable. There may be special requirements or restrictions from local fire departments for the storage and recycling of acetone;
- Waste thinner and solvents are hazardous waste. Shop owners are responsible for proper management and disposal or recycling, and have potential future liability.

There are also cost concerns. Solvent loss from evaporation results in adding make-up solvent and increases costs.

Pollution Prevention Strategies

There are four pollution prevention strategies for spray gun cleaning:

- Extend the effective life of the cleaning solvent with two-stage cleaning,
- Clean with enclosed automatic paint gun washing equipment,
- Use disposable paint cup liners, and
- Use alternative gun cleaning technology.

Two-stage Cleaning

Two stage cleaning is a no-cost practice used to extend the life and effectiveness of the cleaning solvent. Empty the paint pot as much as possible, then:

First stage: rinse paint pot and equipment with used solvent.

Second stage: clean paint equipment with clean solvent.

When the two-stage system stops cleaning effectively, replace the first stage solvent with the second stage solvent. Then, replace the second stage solvent with fresh solvent and recycle the waste solvent.

This system can be used with an automatic gun washer. Pre-cleaning the paint pot in the first stage reduces the amount of paint waste entering the gun washer. Some automatic spray gun washers have a built-in manual cleaning station that makes two-stage cleaning easier.

Enclosed Automatic Paint Gun Washers

Use of an enclosed automatic gun washer can minimize solvent evaporation loss, and reduce worker exposure. An enclosed automatic gun washing system flushes solvent through the paint equipment to remove paint residue without the need for manual cleaning, saving time and labor costs. Units that have a filtration system will extend the life of the cleaning solution. Evaluate your specific needs before choosing equipment. To reduce evaporation losses, make sure the equipment is operating properly. For example, check automatic venting systems to ensure that the fan operates only when open, not continuously.



Disposable Paint Cup Liners



The amount of solvent needed to clean equipment can be greatly reduced by using disposable paint gun liners. Most of the solvent used for spray equipment cleaning is used to remove residual coating from the paint pot. If paint cup liners are used, the residual coating cures in the liner, and is disposed of. This eliminates the need to clean the paint pot. See the "Paint Waste Minimization Fact Sheet" for more information.

Alternative Cleaning Technology

This spray gun cleaning technology uses low vapor pressure, low toxicity paint gun cleaning solutions that can clean as well as commonly used thinners and solvents. The spray gun cleaning equipment circulates the cleaning solution through filters to remove paint solids.

There are two main types of alternative cleaning solutions currently available, one is water based, and the other is citrus based, containing d-limonene.

The **water based alternative** is currently being used in commercial auto body and paint shops. Even though it is water based, it does contain VOCs regulated by Air Resources Board (ARB) and the California air districts. It

works by lifting paint from the spray gun surfaces rather than dissolving it. The system recirculates the solution through two filters to remove paint solids. This keeps the solution cleaning effectively for extended periods of time. Make-up solution will be needed, but not complete replacement of the solution, reducing product and waste disposal costs. It is not necessary to pre-clean paint pots before putting them in the cleaner. The water based solution can be used to clean waterborne coatings as well as solvent based coatings.



Air District Rules

Lower toxicity paint gun cleaning solutions contain VOCs that have not been exempted by the U.S. EPA. The VOC content in these products exceeds maximum levels established for use in some air districts such as South Coast AQMD, San Joaquin Co. APCD. Regulations may change. Check your air district rules to make sure you are using compliant paint gun cleaning solutions.

The **citrus based cleaning system** uses a solution containing d-Limonene, produced from citrus products. Cleaning solution is flushed through the paint gun in a similar way to other automatic paint gun cleaners. The cleaning unit is equipped with continuous filtration to remove paint solids and refresh the cleaning solution. Filters are changed on average once per month to maintain the solution. Heavily soiled paint guns and pots should be pre-cleaned to conserve cleaning solution. Replacement of the solution will vary depending on use, on average once or twice each year. The d-Limonene solution can be used to clean solvent based coatings. It does not work as well with waterborne coatings because the paint does not separate well from the cleaning solution and becomes less effective with repeated use. Currently, the citrus based solution is being used for military paint applications.



Benefits Of Alternative Cleaning Systems:

- Save money on cleaning solution and disposal of hazardous waste;
- Use less toxic cleaning solution;
- Create a safer work environment for employees;
- Reduce fire hazards in the workplace; and
- Receive recognition for being a “green” shop and a good neighbor.

Before Purchasing, You Should Consider The Following:

- The cleaning solution does not evaporate quickly; dry equipment after cleaning with a shop rag or compressed air;
- Filters and spent solution may need to be disposed of as hazardous waste or tested to determine if they are hazardous;
- The alternative cleaning solvents described here are not exempt solvents. They may contribute to smog formation and are not allowed by some air districts; and
- Solvents left over from previous gun cleaning practices must be managed appropriately, including solvents reclaimed in an on-site recycler.

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

The table compares the regulatory and health effects of traditional cleaning solvents to the P2 alternative solvents

Cleaning Solvent Comparison	Type of Solvent	VOC Regulatory Restrictions	Health Concerns	Manage as Hazardous Waste	Flammable Fire Dept. Regulated
Traditional cleaning solvents	Solvent and Thinner	yes	yes	yes	yes
U.S. EPA Exempt solvents	Acetone	no	yes	yes	yes
	Acetone and methyl acetate blend	no	yes	yes	yes
	PCBTF* (Parachlorobenzotrifluoride)	no	unknown	yes	yes
	TBAC* (Tertiary-Butyl acetate)	no	yes	yes	yes
Pollution Prevention (P2) Alternatives	Citrus based	yes	no	waste filters	yes
	Aqueous based	yes	no	waste filters	no

* If exemption has been adopted in a specific air district

Ask The Vendor

How often will the filters and solution need to be changed?

What is the cost of replacement solution and filters?

Are filter and solution wastes hazardous in California? Ask for analysis results.

Does the vendor offer a demonstration period?

Is on site training available from the vendor or manufacturer?

What is the expected pay-back period considering labor, materials and waste disposal costs?

What are the expected energy costs?

Vendor/ Manufacturer	Website	Telephone	Products
Bonny Marlin	www.bonnymarlin.com	(888) 962-7546	Recirculating paint gun cleaning systems
Inland Technology Incorporated	www.inlandtech.com	(800) 552-3100	Recirculating paint gun cleaning systems and ep-921™ cleaning solution
Becca Inc	www.beccainc.com	(800) 655-5649	Becca Envirowash System - paint gun cleaning system uses water-based cleaning solutions
U. S. Polychem	www.uspoly.com	(800) 431-2072	Accrastrip 600 cleaning solution
Vertec BioSolvents	www.vertecbiosolvents.com	(630) 960-0600	VertechBio EL and VertechBio Gold cleaning solution
Herkules	www.herkules.us/guncleaners.html	(800) 444-4351	Cleaning equipment with filtration; dual units for 2-stage cleaning

What users of alternative gun cleaning technology say...

Amato's Collision Specialist in San Diego is a full service auto body and refinishing shop that specializes in high end and European model cars. Amato's purchased the Bonny Marlin cleaning system in January 2004 and uses it to clean most of their paint equipment. According to shop owner, Paul Amato, "This gun cleaning system is the best investment I've made in my 25 years in this business."

Quality Body Works in Eureka is a medium sized collision repair shop specializing in insurance work. Shop owner, Dave Creech, purchased the Bonny Marlin system in January 2005 and he is very pleased with its performance. Dave's main reason for purchasing the system was for environmental and worker health and safety benefits.



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In 2000, Stockton National Guard's Combined Support Maintenance Shop stopped manual gun cleaning with paint thinner and purchased a recirculating gun washer from Inland Technology. According to Staff Sergeant Lincoln, Environmental Coordinator, the EP-921 citrus based solution cleans spray equipment as effectively as thinner and has helped the facility reach waste reduction and cost savings goals.

Hazardous Waste Regulatory Requirements

For information on regulatory requirements contact your local CUPA online at http://www.dtsc.ca.gov/InformationResources/local_contacts.cfm or contact the Department of Toxic Substances Control (DTSC) at (800) 728-6942, http://www.dtsc.ca.gov/ContactDtsc/duty_officers.cfm

To Get An EPA ID Number, Contact:

DTSC
Generator Information Services Unit
(916) 255-1136
(800) 618-6942

For additional information on auto body and paint shop pollution prevention practices and a list of available publications contact:

DTSC
Office of Pollution Prevention and Technology Development
P.O. Box 806
Sacramento, CA 95812-0806
(916) 322-3670
(800) 700-5854
<http://www.dtsc.ca.gov/PollutionPrevention/index.cfm>



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