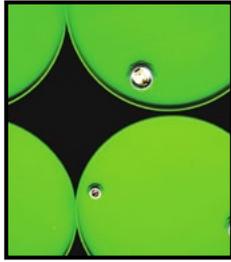




Department of Toxic  
Substances Control



# Hull Preparation: Chemical Stripping

At MSVR facilities, chemical stripping is one of the traditional methods used to remove old paint. This method of hull preparation requires applying paint stripper with a paintbrush and removing the softened paint with a scraper. Chemical stripping does not generate the dust, nor noise levels associated with other hull preparation methods such as <sup>i</sup> [scraping](#), <sup>ii</sup> [sanding](#) and <sup>iii</sup> [blasting](#).

**Paint stripper** or paint remover, is a solvent mixture designed to remove the paint and other finishes while cleaning the underlying surface. Paint strippers come in a liquid or a gel form that cling to vertical surfaces.

By using solvent, acids, and/or caustics, **stripping** involves physical and chemical reactions. In general, paint stripper is applied onto the surface and allowed to stand until the paint blisters. The paint and stripper is then manually removed with a rubber-edged scraping tool, collected and placed in drums for disposal as a hazardous waste. The remaining stripper and paint residue is then removed by flushing the surfaces with water. The rinse water is also collected for offsite disposal as hazardous waste.

Principal active ingredient in paint strippers is methylene chloride, or N-methylpyrrolidone (NMP); and other chemicals such as acetone, toluene, and ketones. Some of the new formulations of chemical strippers are non-chlorinated and biodegradable. There are some environmentally sensitive strippers that are water based (such as dibasic esters, semi-aqueous terpene-based products, detergents and C9 to C12-based hydrocarbon strippers).



## Environmental Concerns:

Paint strippers are solvent-based. They contain chemicals that require proper handling and management.

**Methylene chloride** and **NMP** are both listed on the <sup>iv</sup> [Prop65 list](#)—a California state list of chemicals known to cause cancer or reproductive toxicity.

## Targeted Pollutants:

- Chemicals (MeCl<sub>2</sub>, NMP, etc.)
- Metals
- Paint
- Trash and Debris

## Regulatory Requirements:

1. US EPA Title V permitting under Clean Air Act <sup>v</sup> ([Operating permits](#))
2. Local Air Quality Management District's (AQMDs) in California have delegated authority for Title V permitting. **Please contact your local air district:** <sup>vi</sup> ([California Air Districts](#)).
3. State Water Quality Control Board <sup>vii</sup> ([www.swrcb.ca.gov](http://www.swrcb.ca.gov)):
  - National Pollutant Discharge Elimination System <sup>viii</sup> ([NPDES Permit](#))
4. California Division of Occupational Safety and Health <sup>ix</sup> ([CAL/OSHA](#))
  - Personal Protective Equipment <sup>x</sup> ([PPE](#))



## Recommended Practices (RPs) for Chemical Stripping

1. **Evaluation:** determine the need of for stripping surfaces by;
  - Evaluating the condition of old paint (Does it easily flake off with a scraper?)
  - <sup>i</sup> [Scraping](#), <sup>ii</sup> [sanding](#); and/or <sup>iii</sup> [blasting](#) to remove old paint
  - Determine if it's possible to re-coat without stripping
  - Assessing what type of paint is to be removed and what is the project's size
  - Identifying underlying coat or material and whether it needs protection
2. **Safer Alternatives:** When stripping must be used, try using safer alternatives;
  - Use alternative strippers that do not contain **methylene chloride** and/or **NMP**
  - Review the stripper's Material Safety Data Sheet (MSDS) for safety and environmental precautions
  - Always use proper personal protective gear (PPE) when handling strippers containing **methylene chloride** and/or **NMP**
  - Use the minimum amount of stripper needed to thoroughly contain the removed paint sludge
  - Always use tight fitting lids and securely closed containers to prevent spills and evaporation
  - Maintain records of annual paint strippers' usage
3. **Designated Area:** Set aside a clearly marked area for stripping activities that is far from surface waters and drainage pathways;
  - Preferably located in a building with proper ventilation and filters
  - Ground surface must be impervious such as sealed asphalt or concrete (not over open ground)
  - If concrete or asphalt is not practical, a heavy or durable tarp can be placed on the ground
  - Area must be bermed to contain any spills and prevent them from washing away
  - Hang plastic barriers or tarpaulins to enclose, and contain stripping activities
  - Any waste water generated from chemical stripping must be channeled to the onsite treatment system
4. **Cleanup:** Cleanup must be scheduled at the end of the shift and/or when the project is complete to avoid contamination of other areas of the facility;
  - Work area must be equipped with clearly marked receptacles for collecting stripping and paint waste
  - Dispose of removed paint sludge or excess stripper as <sup>xi</sup> [hazardous waste](#) by using a licensed hauler
  - Do not dispose of removed paint sludge or excess stripper into a sanitary sewer



5. **Good Housekeeping:** Good housekeeping and management practices require implementation to promote pollution prevention during stripping activities;

- Schedule routine site inspections to ensure RPs are implemented
- All RPs must be reviewed periodically and revised as necessary
- Train employees on proper stripping, personal safety, waste management and disposal procedures
- Allow only trained employees to perform stripping
- Emphasize safety concerns for on the job training operational procedures
- Updated training should be done on a regular basis
- Provide and encourage use of personal protective equipmet (PPE) such as Tyvek suits, gloves, respirators, etc.
- Provide educational materials and signage in English and Spanish, and/or other foreign languages commonly used in your area



### Recommended Stripping Products

- Use less-toxic/non-toxic products. For example, use water-based products with low volatile organic compounds content
- Avoid paint strippers containing solvents such as methylene chloride, trichloroethylene (TCE) benzene, 1,1,1-trichloroethane (TCA), xylene, or toluene



## References and Other Resources:

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- I. <http://www.dtsc.ca.gov>
- II. <http://www.dtsc.ca.gov>
- III. [www.arb.ca.gov](http://www.arb.ca.gov)
- IV. [http://oehha.ca.gov/prop65/prop65\\_list/Newlist.html](http://oehha.ca.gov/prop65/prop65_list/Newlist.html)
- V. <http://www.epa.gov/air/oaqps/permits/>
- VI. <http://www.arb.ca.gov/capcoa/roster.htm>
- VII. [http://www.swrcb.ca.gov/water\\_issues/programs/npdes/](http://www.swrcb.ca.gov/water_issues/programs/npdes/)
- VIII. [www.dtsc.ca.gov](http://www.dtsc.ca.gov)
- IX. <http://www.dir.ca.gov/dosh/puborder.asp>
- X. [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=9777](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9777)
- XI. [http://www.dtsc.ca.gov/HazardousWaste/upload/HWMP\\_DefiningHW11.pdf](http://www.dtsc.ca.gov/HazardousWaste/upload/HWMP_DefiningHW11.pdf)

**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>

Environmental Boating Program Coordinator  
California Department of Boating & Waterways  
California Coastal Commission  
45 Fremont Street, Suite 1900  
San Francisco, CA 94105  
[www.BoatingCleanandGreen.com](http://www.BoatingCleanandGreen.com)  
(415) 904-6905

