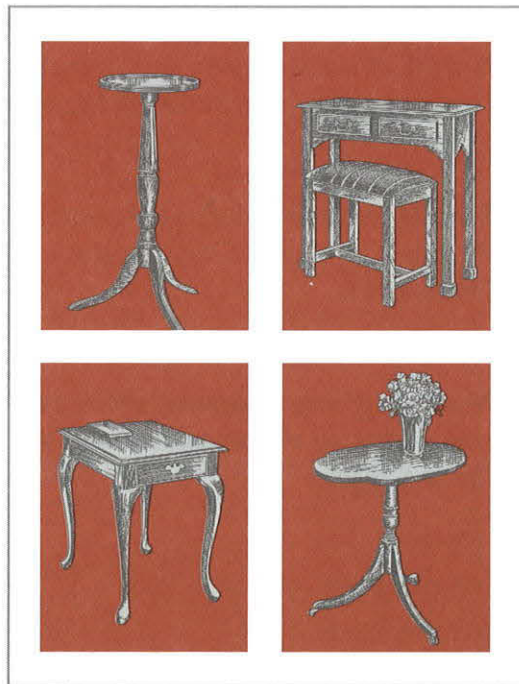




A First Place Finish

*An Environmental Guide for
Vermont Wood Finishers*



June 1999

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and NEWMOA would appreciate acknowledgment.

This Guide was developed by the following:

Vermont Department of Environmental Conservation, Environmental Assistance Division is a **free, confidential, non-regulatory** assistance program for Vermont companies. Services include: on-site assessments, workshops, seminars, written materials, and information and research on pollution prevention and environmental compliance.

Vermont Small Business Development Center offers **free and confidential** business counseling, and environmental assessments and referrals. These services are aimed at identifying pollution reduction and resource conservation opportunities in order to enhance profitability through the promotion of a cleaner environment.

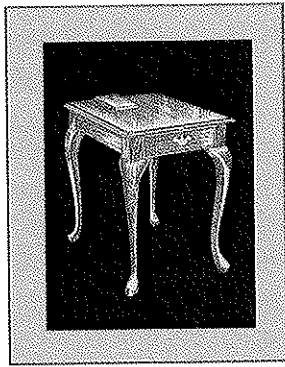
This Guide was also prepared by the Northeast Waste Management Officials' Association (NEWMOA). NEWMOA is a nonprofit, nonpartisan interstate organization that addresses regional waste and pollution prevention issues. NEWMOA provides a forum for increased communication and cooperation among the member states, a vehicle for the development of unified positions on various issues and programs, and a source for research and training. The NEWMOA member states are Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

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Mention of any company, process or product name should not be considered an endorsement by VT DEC, VT SBDC, NEWMOA, or the U.S. EPA

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Introduction

We have designed this environmental compliance assistance guide to help you, the small and medium-sized wood finisher, to meet your environmental obligations. The guide contains a self-assessment checklist and other information on pollution prevention and compliance with Vermont Department of Environmental Conservation's (DEC) laws and regulations on air pollution, hazardous waste, and wastewater disposal.

How to Use This Guide

We have tried to make this guide clear and concise, but with enough detail so that most of your questions will be answered. The information in this guide is divided into four parts: compliance checklists, pollution prevention (P2) tips, fact sheets, and appendices.

The compliance checklists are based on the type of waste that is generated: air emissions, hazardous wastes, and wastewater. Questions are presented in a yes/no checklist format so that if you can answer "yes" to a question, you are likely to be in compliance with that requirement. An answer of "no" could indicate a potential problem that you should investigate further. **If your answer is "no," you might have a problem if inspected.**

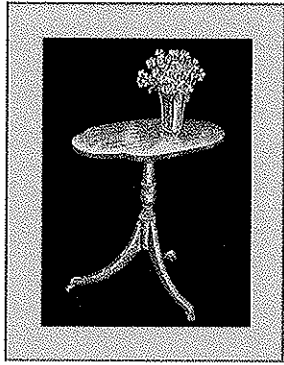
If available, the following information resources should help you complete the checklist questions:

- purchase and/or material usage records for the last 12 months,
- material inventories for the last 12 months,
- material safety data sheets (MSDS) for all products you use,
- hazardous waste shipment manifests, and
- currently held state or local permits, such as discharge permits.

The next section briefly discusses P2 and waste reduction strategies for wood coaters, including case studies illustrating the savings realized by companies that have implemented one (or more) of these strategies. The third section contains useful fact sheets for wastestreams and environmental issues commonly faced by manufacturers of wood products. The appendix section contains additional materials we think you might find useful, such as sample forms, and resource lists.

If you are not sure whether a particular practice or activity at your facility meets the regulations, please contact the Vermont Environmental Assistance Division (EAD) or the Vermont Small Business Development Center (SBDC) listed on the back cover of this guide, and they will get answers for you. You may also request a **free and confidential (non-regulatory) on-site compliance assistance** visit by contacting the EAD's Small Business Compliance Assistance Program.

Environmental Assistance Hotline: 1 - 800 - 974 - 9559



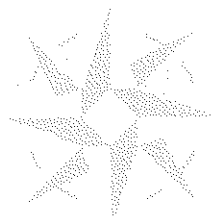
Top Ten Tips for Environmental Success

- ✱ **Learn about pollution prevention** - The less waste you generate in the first place, the less there is to be regulated and the easier your job will be to maintain compliance. You will also save money, improve health in the workplace and contribute to environmental protection. Switching to high-solids finish materials, improving transfer efficiency, and minimizing wastes related to clean-up are just some of the general strategies you might employ to prevent pollution.
- ✱ **Keep good records** - Keep every receipt, bill of lading, and hazardous waste manifest every time you buy materials or dispose of your waste. Good records, filed by year and easily accessible, will help you keep better track of material use and waste management. If you are inspected, good recordkeeping can minimize the time and effort involved. Good recordkeeping can also expedite a property sale or loan.
- ✱ **Involve your employees** - More often than not, the people on the shop floor have **good ideas on how to generate less waste**. Reward them! If their idea saves the company money, consider giving them a percentage of the savings. Make sure your employees know that you **welcome their ideas** and that they will not get in trouble for showing that the way things are currently done creates unnecessary waste.
- ✱ **Call your vendors** - Many vendors will continue to sell you what you've always used; even though there may be a better product available. Ask your vendor - is there a non-toxic substitute for your present coating?.. is there a water-based substitute for a coating you could try?..is there a non-hazardous substitute for your thinner?.. what do his other clients use that might work for you? But also **BEWARE and learn about the trade-offs**: for example, "compliant coatings" that are reformulated with acetone might increase your facility's safety hazard since acetone is highly flammable. Acetone is also a listed hazardous air contaminant in Vermont. "Compliant" coatings are not necessarily the same as "safe" coatings.
- ✱ **Learn how to read an MSDS and avoid toxics** - Material Safety Data Sheets (MSDSs) are documents that come with most chemical products you buy. They give you key environmental, health, and work place safety information. Reading an MSDS before making a purchase could help you avoid problems down the road. Avoid commonly used solvents like toluene, xylene, MEK, MIBK, methanol, and methylene chloride. Ask your supplier for **less hazardous alternatives**.
- ✱ **Train your staff** - Often times, training is looked upon as unproductive overhead; you can't sell training like you can a product. However, proper spray technique can reduce coating use by 10-20 percent and using the correct spray gun settings can save you up to another 20 percent. Ask your supplier to help you determine proper spray gun settings and spray technique. A well-trained staff produce finished work more efficiently, create less waste, spill less, and have fewer accidents. These add up to **increased profits in the long run**.
- ✱ **Be aware of fire and other worker health and safety hazards** - Don't store solvents or used rags near ignition sources. Keep used rags in closed metal containers. Enforce an appropriate no smoking policy. Ground your containers of flammable liquids or solids when dis-

pensing or adding materials. Take advantage of the Vermont Occupational Health and Safety Administration's (VOSHA) **free and confidential** consultation and training service to assist you in maintaining a safe workplace by calling (800) 287-2765. Be sure to ask them for a copy of the new OSHA report, *A Guide for Protecting Workers from Woodworking Hazards*.

- ☼ **Label waste containers and put them in one spot** - Nothing can get you into trouble faster than sloppy, disorganized waste storage. Separate your waste storage from your product storage area. There are several requirements for proper waste storage - see the Hazardous Waste section of this guide or call the Hazardous Waste Program at (802) 241-3888 for more information.
- ☼ **Don't throw it in the dumpster** - Hazardous substances should never be handled like regular trash. See the Hazardous Waste section of this guide or call the Hazardous Waste Program at (802) 241-3888 for information on proper disposal of hazardous wastes. Look for ways to recycle non-hazardous wastes such as scrap wood, corrugated cardboard, and paper. Contact your local solid waste management facility for recycling information and assistance (see Recyclable Materials Fact Sheet for contact information) or call the Recycling Hotline at (800) 932-7100.
- ☼ **Ask for help** - As burdensome as environmental regulations may seem, they were created to protect you and your workers and they are here to stay. So stay ahead of the game - use the technical resources available to you - we are here to help you understand and comply with the regulations and look for waste prevention opportunities. **Call us! We offer free, confidential assistance** ranging from answering an anonymous question over the phone to providing you with a team of experts for on-site assistance. You've got nothing to lose, and maybe a lot to gain, by calling the...

Environmental Assistance Hotline - (800) 974-9559

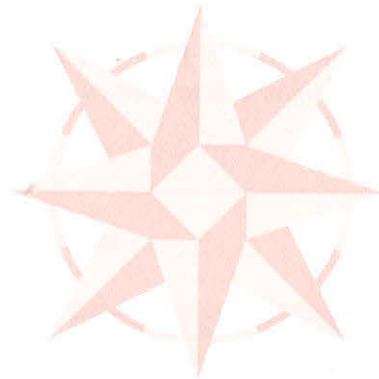


Self-Assessment Checklists

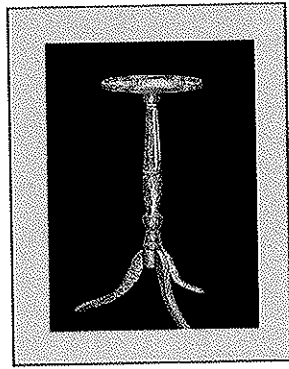
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*At the time of publication, all the regulatory information in this guide was accurate. However, laws and regulations can change frequently. You should check with the DEC to find out if there have been any regulatory changes that affect your facility. **It is ultimately your responsibility to know and understand the health, safety, and environmental regulations that apply to your business.***



Air Emissions

Vermont wood finishers that use solvent-based coatings could be affected by two state air emission control requirements.

- Many solvents used in the wood coating industry are primarily made up of one or more volatile organic compounds (VOCs). VOCs combine and interact with other pollutants in the air to form "ground-level ozone," the main component of "smog." In order to help reduce the formation of ground-level ozone, VOC emissions are regulated under several sections of Vermont's Air Pollution Control Regulations. Instructions for calculating your VOC emissions are contained in Appendix A.
- Many individual solvents can also be of concern because they are associated with harmful effects to human health and are regulated as Hazardous Air Contaminants (HACs) in Vermont. Vermont regulates HACs whenever emissions exceed the "action level" set in the Air Pollution Control Regulations. The Action Level is set based on the individual toxicity of the HAC. The individual volatile HACs are usually, but not always, VOCs. For example, xylene and toluene are both HACs and VOCs, but acetone is only a HAC. Likewise, some compounds may be VOCs but not HACs. For simplicity, you can assume a compound is both a VOC and a HAC, unless otherwise specified. The list of HACs is contained in Appendix B. The associated regulations can be obtained by calling the Air Toxics Control Program at (802) 241-3840. Instructions for calculating your HAC use are contained in Appendix C.

To learn more about the chemicals you use, including how hazardous they are and the concentration of VOCs and HACs they contain, you need to understand the information provided by your suppliers on the material safety data sheet (MSDS) for each coating, gluing, washoff, and cleaning material you purchase. The MSDSs combined with the list of HACs provides key information to help you determine how you might be regulated in Vermont.

Some of the solvents typically contained in the coatings and other materials used by wood finishers are outlined in Table 1. Note that this is not an exhaustive list - there are many more chemicals that could be in your coating, gluing, washoff and cleaning materials that are also of concern.

Table 1: Commonly Used Solvents

CHEMICAL	VOC	VT HAC
Acetone	No	Yes
Methanol	Yes	Yes
Methylene Chloride	Yes	Yes
Methyl Ethyl Ketone (MEK)	Yes	Yes
Methyl Isobutyl Ketone (MIBK)	Yes	Yes
Toluene	Yes	Yes
Xylene	Yes	Yes

Vermont sets an "action level" for each HAC that is based on the quantity used in an average 8-hour workshift. If your facility exceeds the action level for even one HAC, you need to contact the DEC's Air Pollution Control Division. They might require that you evaluate alternative materials and/or production processes to reduce your use of HACs. Appendix C contains information to help you determine if your facility exceeds any of the action levels. The action level for some of the solvents commonly used by wood finishers is listed in Table 2. The action levels for all HACs are listed in Appendix B. However, the Air Pollution Control Division intends to amend the current regulation. You should contact the Air Pollution Control Division at (802) 241-3840 to obtain the correct action level for the HACs used at your facility.

Table 2: Action Levels for Commonly Used HACs

CHEMICAL	ACTION LEVEL (lbs. used/8 hours)	PROPOSED ACTION LEVEL* (lbs. used/8 hours)
Acetone	7,480	4,989
Methanol	322	322
Methylene Chloride	0.16	0.16
Methyl Ethyl Ketone (MEK)	248	42
Methyl Isobutyl Ketone (MIBK)	25	4.16
Toluene	464	20.80
Xylene	86.3	85.76

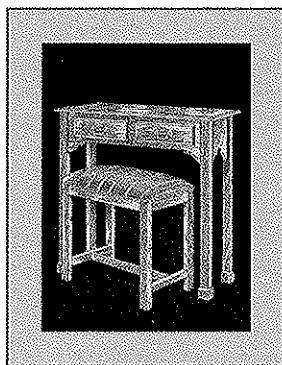
* While the proposed action levels are not presently required, the Air Pollution Control Division intends to amend the current regulation to change the formula by which action levels are calculated. When adopted, the new formula will result in the "proposed action level" shown.

The self-assessment checklist in the following section can help you to evaluate air emissions at your facility and alert you to any potential compliance issues.



Self-Assessment: Air Emissions

	Yes	No
<p>1. We maintain purchase and/or usage records to document the quantity of material we use that contains VOCs and HACs in each year.</p> <p><i>You should keep your records for at least five years.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>2. We keep the MSDS for each coating, gluing, washoff and cleaning material that we use.</p> <p><i>You should keep your MSDSs for at least five years.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>3. Whenever parts are not being handled, we close the cover on any cleaning equipment, such as gun washers and parts cleaning sinks, that uses a VOC-containing solvent.</p> <p><i>You should always cover all containers that hold a volatile material to prevent evaporation. Evaporation is a waste that increases worker exposure and the need to purchase virgin material.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>4. Our facility is below the "action level," for all hazardous air contaminants (HACs). If not, we have informed the DEC Air Pollution Control Division.</p> <p><i>Details on how to perform the calculations necessary to determine if your facility is under the "action level" for each HAC are contained in Appendix C. Call the Air Pollution Control Division at (802) 241-3840 with any questions.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5. We have completed a VOC emission calculation for all VOC-containing products used at our facility.</p> <p><i>Details on how to perform VOC emission calculations are contained in Appendix A. Call the DEC Air Pollution Control Division at (802) 241-3840 with any questions.</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>6. Our VOC calculations show that our actual VOC emissions from the facility are below 5 tons per year. If not, we have informed the DEC Air Pollution Control Division.</p> <p><i>Facilities emitting more than 5 tons of VOCs and other air pollutants per year must complete a "source registration" with the Air Pollution Control Division. Facilities emitting more than 10 tons per year must obtain an "operating permit."</i></p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>7. We have read the Air Pollution Fact Sheet and are in compliance with it.</p>	<input type="checkbox"/>	<input type="checkbox"/>



Hazardous Waste

Hazardous wastes commonly generated by wood finishers, and their corresponding waste codes are listed in Table 3. Note that this is not an exhaustive list - there could be other wastes generated at your facility that might also be of concern.

Table 3: Commonly Generated Hazardous Wastes

GENERAL WASTE STREAM	USUAL WASTE CODE	LIKELY HAZARDOUS PROPERTIES
Thinner, clean-up solvents, still bottoms	D001, F003, F005	Typically ignitable, petroleum-based solvents that contain toxic constituents.
Stains, sealers, lacquers	D001, F003, F005	Often have ignitable solvents that may contain toxic constituents such as methyl ethyl ketone (MEK).
Paints, paint-related materials	VT02, D001 F003, F005	Often have ignitable solvents or >5% petroleum content that contain toxic constituents. Some colored paints may be toxic for metals.
Lacquer dust	D001	Often ignitable, may contain toxic constituents.
Rags	VT02, D001, F003, F005	Exempt if laundered according to policy (see Shop Rags Fact Sheet).
Spraybooth filters	D001	Could be ignitable and/or toxic. Some colored paints may be toxic for metals. Perform hazardous waste characterization tests.
Oil-soaked absorbent materials	VT02	Petroleum content >5% by weight.
Parts cleaning solvents	VT02, D001	Typically ignitable, petroleum-based solvents.
Vehicle crankcase oil, machine gearbox and hydraulic oils	Should be managed as used oil according to Vermont's Hazardous Waste Regulations.	Petroleum distillate and suspected carcinogen. See Used Oil Fact Sheet.

Wastes can be hazardous because they are "listed" wastes, "characteristic" wastes, or a hazardous waste mixture. Listed hazardous wastes are specific chemicals and wastes generated from either generic or specific industrial processes. For example, spent solvents are a listed waste. Listed hazardous wastes carry waste codes beginning with F, or VT if the waste is a Vermont listed waste. Wastes that are not listed can also be hazardous if they are classified as characteristic wastes because they are ignitable (D001), corrosive (D002), reactive (D003), and/or toxic (D004-D043). For example, many pigmented coatings contain metals that could be of concern due to their toxicity. Generally, wastes from the wood finishing process are characteristic hazardous wastes because of ignitability and/or toxicity.

You need to perform a "hazardous waste determination" on each type of waste generated at your facility to determine whether or not it is a hazardous waste. If the waste is a listed waste, it is automatically a hazardous waste. If the waste is not a listed waste, you can make the hazardous waste determination either by "knowledge of the process" (including information from the MSDSs of the raw materials), or by actual laboratory analysis.

In addition to knowing which of your wastes are hazardous, you also need to know how much hazardous waste is generated each month. If you generate any amount of hazardous waste, you are subject to Vermont's Hazardous Waste Regulations. However, "Conditionally Exempt Generators" (CEGs) have fewer regulatory requirements than "Fully Regulated Generators." A CEG produces less than 220 pounds per month of hazardous waste (approximately 1/2 of a 55 gallon drum per month). Many, if not most, wood products manufacturers should be able to qualify as CEGs.

The self-assessment checklist in the following section can help you to evaluate the hazardous waste management procedures in place at your facility and alert you to any potential deficiencies. The checklist will help you comply with CEG requirements. Additional information about CEG requirements is contained in the *Conditionally Exempt Generator Handbook* available by contacting the Environmental Assistance Division Hotline at (800) 974-9559.

If you generate more than 220 pounds of hazardous waste per month, you are a fully regulated generator and should contact the Waste Management Division at (802) 241-3888 or the Environmental Assistance Division Hotline at (800) 974-9559 to learn of the additional requirements affecting your business. The Waste Management Division can provide you with their excellent resource: *Hazardous Waste Generator Handbook*.

The safe storage, transport and disposal of your hazardous wastes can reduce your environmental liability. The cost of cleaning up an accidental release is much higher than the cost of proper hazardous waste management.

Self-Assessment: Hazardous Waste

	Yes	No
<p>1. We have determined which of our wastes are hazardous and which are not.</p> <p>Check Material Safety Data Sheets (MSDS) to pre-screen new products being considered for use. An MSDS can provide key environmental, health and workplace safety information. Reading an MSDS before buying a product can help you decide if the product will add to your generation of hazardous waste. Talk to your vendors about non-hazardous alternatives. If you have questions, call the Environmental Assistance Division Hotline at (800) 974-9559.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>2. We have calculated our monthly waste generation rate and have determined that we are a conditionally exempt generator (CEG).</p> <p>If you are not a CEG, you are a fully regulated generator and are subject to greater regulation than CEGs.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>3. We have filed a "Hazardous Waste Notification Form" with the Waste Management Division.</p> <p>The generation of all amounts of hazardous waste is subject to regulation. The Hazardous Waste Notification Form and Instructions are contained in Appendix D.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>4. As a CEG, we do not store more than 2,200 pounds of hazardous waste (approximately five 55-gallon drums) on-site at one time.</p> <p>A word of CAUTION!! If you ever accumulate more than 2, 200 pounds at any one time you are subject to all the requirements of a fully regulated generator for as long as you continue to have more than 2, 200 pounds of waste on-site.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>5. We store hazardous wastes in containers that meet the following:</p> <ul style="list-style-type: none"> • are in good condition and compatible with the waste being stored • are clearly labeled with the words "Hazardous Waste" and other words that identify the contents (e.g. "oily debris, or "cleaning solvent") • are kept closed except to add or remove waste (a drum-mounted funnel must be covered for the container to be considered closed) • containers holding ignitable wastes (e.g. lacquer thinner) must be made of metal and be grounded, and must be located at least 50 feet from the property line <p>Segregating waste streams and preventing mixing of wastes makes recycling easier and might lower disposal costs.</p> <p>Periodically inspect waste containers for leaks - leave at least 2 feet of space between aisles</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>6. We store the hazardous waste containers in an area that meets the following:</p> <ul style="list-style-type: none"> • has an impermeable surface • is out-of-doors only if containers are under a cover that sheds rain and snow and wastes are not subject to freezing and expansion (unless measures are taken to prevent freezing) <p>Wastes should always be stored away from floor and storm drains. Storage areas should be protected from unauthorized access and inadvertent damage by vehicles or equipment.</p>	<input type="checkbox"/>	<input type="checkbox"/>

	Yes	No
<p>7. We ship hazardous wastes to licensed treatment, storage or disposal facilities (TSDF) using certified hazardous waste transporters and hazardous waste manifests.</p> <ul style="list-style-type: none"> • A list of certified transporters can be obtained by calling the EAD Hotline at (800) 974-9559. • After every shipment of hazardous waste, you must send a copy of the manifest to the Waste Management Division. An example hazardous waste manifest is provided in Appendix E. • If you are a CEG you can self-transport small quantities (up to 55 gallons at a time) of hazardous waste to a certified TSDF, to a municipal CEG hazardous waste collection site or to a generator facility under the same ownership as your facility. If self-transporting, U.S. Department of Transportation hazardous materials placarding requirements may apply to your vehicle. For more information call the Vermont Agency of Transportation, Department of Motor Vehicles, Commercial Vehicle Enforcement Unit at (802) 828-2078. If you are a CEG and self-transport your waste, you do not need to manifest the waste. 	<input type="checkbox"/>	<input type="checkbox"/>
<p>8. We send our rags to a commercial laundry in accordance with the practices identified in the attached Shop Rags Fact Sheet OR we manage the used rags as a hazardous waste.</p> <p>Used rags should be immediately placed in foot-operated, self-closing VOSHA-approved metal containers.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>9. We do not put waste containers in the trash until we have removed enough material/residue for the cans to be called "empty."</p> <p>To qualify for the "empty container" exemption in the hazardous waste regulations, the amount of hazardous residue in the container must be less than 1 inch or no more than 3 percent (by weight) of the total capacity of the container if the container has a volume of 110 gallons or less. If the container is larger than 110 gallons, it can contain no more than 0.3 percent (by weight) of the total capacity of the container.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>10. We do not ship any liquid wastes, even if not hazardous, to a landfill.</p> <p>All solid waste landfills prohibit acceptance of any hazardous waste for disposal. Landfills of any type are prohibited from accepting liquid wastes of any kind. Do not put liquid wastes in the trash.</p>	<input type="checkbox"/>	<input type="checkbox"/>
<p>11. We manage our equipment, materials, or wastes as described in the following Fact Sheets:</p> <ul style="list-style-type: none"> • Floor Drains • Recyclable Materials • Shop Rags • Spills • Used Oil 	<input type="checkbox"/>	<input type="checkbox"/>

Wastewater

All facilities generate some type of wastewater. Wastewater discharges are regulated by the Wastewater Management Division (WWMD) in Waterbury and through five Regional Offices (see Appendix F for the Regional Office nearest you). Wastewater can be generated from bathroom and kitchen facilities (known as sanitary or domestic wastewater), from manufacturing or other processes (known as process, or non-domestic wastewater), or it can be a combination of sanitary and process wastewater. **Under no circumstances should hazardous materials, such as cleaning solvents or coatings be discharged to any type of wastewater system.** Liquid wastes that contain hazardous constituents must be collected and handled as a hazardous waste.

Wastewater discharge is typically to a municipal wastewater treatment plant, an on-site sub-surface system (e.g. septic system or dry well), or in very limited circumstances, to the surface of the ground.

Discharge to Municipal Sewer System

Sanitary Wastewater Discharges Only

DEC requires a wastewater permit for any sanitary discharge from a business or other public building to a municipal wastewater treatment plant unless the discharge began prior to 1972 and the system has not been modified since 1972. For more information, contact the WWMD Regional Office serving your area (see Appendix F).

Process Wastewater Discharges

Facilities that discharge non-sanitary wastewater (e.g. floor drain wastewater, mop water, or any process-related wastewater) to a wastewater treatment plant must notify the WWMD, the operator of the municipal plant, and the person responsible for administering the local sewer ordinance. Depending on the volume and make-up of the discharge, the facility might be required to obtain a "pretreatment" permit from the WWMD. It is unlikely that such a permit would be required for "mop water" or other typically low risk discharge, but it is always necessary to make the required notifications, and to obtain approval (in writing, if possible) for the discharge. The municipality may require that non-sanitary wastewater pass through an oil/water separator before discharge to the treatment plant. For more information, contact the WWMD Regional Office serving your area (see Appendix F).

Discharge to an On-site System

Sanitary Wastewater Discharge Only

Any strictly sanitary discharge from a business or other public building requires a permit unless the discharge began prior to 1972 and the system has not been modified since 1972. Contact the WWMD Regional Office serving your area (see Appendix F) for information on obtaining a wastewater disposal permit for sanitary discharge.

Process Wastewater Discharges

All facilities with existing discharges of non-sanitary wastewater to subsurface systems (e.g. septic systems, dry wells and holding tanks) must inform the WWMD Regional Office serving their area (see Appendix F) of the discharge. The situation is reviewed by an engineer in the regional office who determines whether or not the discharge is allowable. This review process applies to any discharge of process wastewater, whether the wastewater is a combination of sanitary and non-sanitary wastewaters (a "combined waste") or is disposed in an on-site system that is separate from sanitary wastewater (e.g. a dry well).

Although, under limited circumstances a business might be able to obtain a permit to discharge process wastewater on-site, the potential liability of such a practice should be given serious consideration. Even a small quantity of solvent-containing material can contaminate groundwater. If persons nearby (or your facility) depend on groundwater you have the potential to contaminate their drinking water well. Therefore, DEC generally discourages the discharge of any non-sanitary wastewater to the subsurface.

Discharges to the Ground (Daylighting) of Non-Sanitary Wastewater

Daylighting is the practice of discharging floor drain or other process wastewater to the ground surface. Daylighting of floor drain wastewater is prohibited if the water originates in an area where hazardous materials are used or stored. Note that daylighting might be approved by your WWMD Regional Office if all the following apply:

- the wastewater does not discharge directly to surface water (e.g. a stream or pond) or wetland;
- the discharge is infrequent and of low volume; and
- the discharge does not contain hazardous materials or waste.

Floor Drains

Floor drains that discharge to a subsurface disposal system (e.g. septic system or dry well) must be registered as an underground injection control (UIC) well with the WWMD Regional Office serving your area (see Appendix F). The registration process consists of completing an UIC application for review by a WWMD engineer who will determine whether or not an UIC permit is required. Please refer to the Floor Drain Fact Sheet for more information.

Self-Assessment: Wastewater

All Facilities

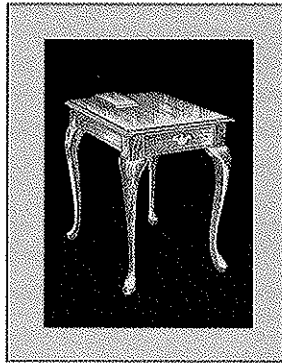
- | | Yes | No |
|---|--------------------------|--------------------------|
| 1. We have a discharge of sanitary wastewater only, and we have obtained
a permit from our WWMD Regional Office.
<i>If the strictly sanitary discharge began prior to 1972 and the system has not
been modified since 1972, a permit is not required.</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. We do not discharge any wastewater of any kind to surface water or wetlands.
<i>Direct discharge of all wastewater, domestic and non-domestic to surface water or
wetlands is regulated by DEC, requires treatment, and a permit (if the discharge
can be allowed at all).</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. We do not dispose of waste solvents, hazardous materials, or oil through
our sinks or floor drains. | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. We have identified the discharge points of all our floor drains.
<ul style="list-style-type: none"> • <i>All existing floor drains located in areas where hazardous materials, such as thinners and cleaning solvents, as well as solvent-based paints, stains, sealers and other coatings, are used or stored (e.g. your production areas, as well as material storage areas) will eventually be phased-out and will need to be permanently closed or have the discharge routed to either a municipal wastewater treatment plant or a holding tank.</i> • <i>No new floor drains are permitted in areas where hazardous materials are used or stored unless the discharge is connected to either a municipal wastewater treatment plant or a holding tank.</i> • <i>Daylighting (i.e. discharge to the ground surface) of floor drain wastewater is prohibited if the water originates in an area where hazardous materials are used or stored.</i> • <i>See the Floor Drain Fact Sheet for more information.</i> | <input type="checkbox"/> | <input type="checkbox"/> |

Facilities on Public Sewer Only

- | | | |
|---|--------------------------|--------------------------|
| Our facility is on public sewer, and we do not discharge any non-sanitary
wastewater to the system without the proper approval from our municipality
and notification to the WWMD.
<i>Before authorities can approve the discharge of non-sanitary wastewater, at a
minimum they will need to know the average daily volume and whether or not the
discharge is likely to contain any hazardous constituents. Depending on the source,
they might request additional information such as pH (relating to corrosivity)
and/or the BOD (oxygen depleting potential) of the wastewater.</i> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|

Facilities Discharging On-Site Only

- | | | |
|--|--------------------------|--------------------------|
| 1. Our facility is on a septic (or other subsurface) system, and we do not
discharge any non-sanitary wastewater, such as from floor drains and sinks
without informing the proper WWMD Regional Office (see Appendix F)
of the discharge.
<i>It is illegal to discharge hazardous wastes to ground or surface waters.</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. We have read the Floor Drain Fact Sheet and are in compliance with it. | <input type="checkbox"/> | <input type="checkbox"/> |



Pollution Prevention and Best Management Practices

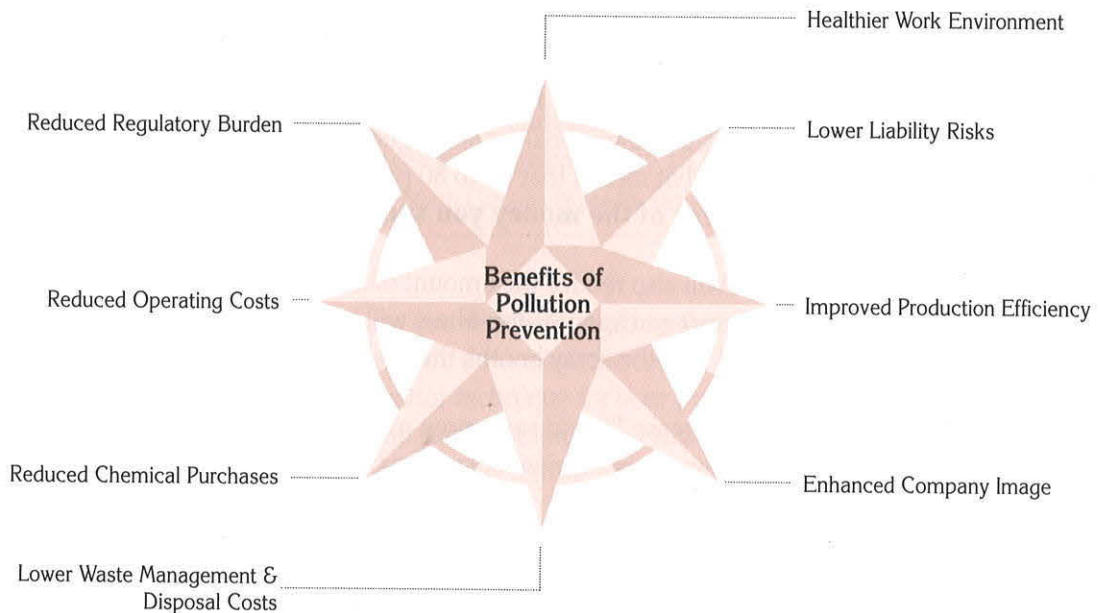
Pollution prevention (P2) is any activity that reduces or eliminates the initial generation of waste at its source - before it becomes a pollutant. Common P2 techniques fall into three categories: substituting less toxic materials; modifying equipment and processes to use smaller quantities of toxic materials; and improving operation and maintenance procedures, including employee training.

By minimizing or eliminating the quantity of waste that your facility generates, you can reduce or eliminate certain regulatory requirements. P2 is easier, cheaper, and more efficient than trying to treat, recycle, or dispose of waste or pollution after it has been created. Therefore, P2 techniques are an important, **cost-effective method of achieving compliance**.

By reducing waste at its source you can:

- Reduce operating and disposal costs,
- Improve worker safety and productivity,
- Ease regulatory compliance burdens, and
- Reduce long-term liability.

Implementing P2 is a smarter, cleaner, safer way to do business!



You may not realize the amount of harmful chemicals that are released into the air when solvent-based coatings are used. If you have a gallon of paint that weighs 8 pounds, and it is 75 percent solvents by weight (i.e., 25 percent solids), then by the time you've used that gallon, 6 pounds of solvents have gone into the air for you, your employees, and your neighbors to breathe. Some finishes, such as stains, can contain less than 5 percent solids, so over 95 percent of the original weight of each gallon ends up in the air.

Generally, the most commonly used wood finishing chemicals, such as toluene, xylene, MEK, MIBK, methanol, and methylene chloride can affect the central nervous system. Exposure to these chemicals can cause dizziness, headaches, nausea, confusion, sleepiness, and loss of coordination. These symptoms can decrease productivity and increase injury rates. Long-term effects can include cancer and reproductive problems, or damage to the liver, kidneys or brain. It is unclear whether repeated low-level exposure can impair mental and physical abilities or have serious long-term effects. Until we are certain that exposure to these chemicals is harmless, reducing exposure is the safest approach.

Reducing Air Emissions

The easiest way to reduce air emissions is to reduce the quantity of the coatings you already use. Most likely you can produce the same product with less coating. Becoming more efficient with your coating use will **save you money**. There are two main ways to cut coating use: improve transfer efficiency and increase the solids content of your coatings. If you apply your coatings by dipping or brushing, your transfer efficiency is already high and you can skip the following section on improving transfer efficiency. You should still evaluate increasing the solids content of your coatings. All manufacturers should evaluate alternative coatings such as waterborne or uv-cure.

Improve Transfer Efficiency

Transfer efficiency (TE) is the amount of coating that leaves the spray gun and actually contacts the piece being finished. Traditional air spray guns have a low TE, only 20 to 40 percent under actual line conditions. That means that 60 to 80 percent of the coating used is wasted. In other words, **60 to 80 percent of the money you spend on coatings is probably wasted.**

Improving TE will also reduce the amount of solid and/or hazardous waste you generate. You'll generate less overspray so spray booth filters will last longer, there will be less lacquer dust to clean up and dispose of, and the spray booths themselves will require less frequent cleaning.

How can you increase TE and save more money? You can train operators to use better spray techniques and/or buy more efficient spray guns.

Operator Technique

Spray gun operators control many of the factors that affect TE, including:

- coating flow rate and pressure,
- air flow pressure and velocity,
- distance between spray gun and object,
- width of spray pattern, and
- the neatness of the application.

Proper operator technique can increase TE by up to 20 percent. Proper operator technique includes:

- hold the spray gun perpendicular to the surface of the part being sprayed,
- trigger the gun after each pass,
- overlap each stroke by 50 percent,
- maintain a constant distance between the gun tip and the part,
- spray with a suitable speed,
- adjust the air and fluid pressures at the pressure tank, not by adjusting the gun, and
- select the correct tip size for the coating and gun used.

It is always better to change the gun tip and nozzle size rather than increasing the air and/or fluid pressure. **The correct nozzle and tip size and shape can increase TE by up to 20 percent.** A rule of thumb is that the lower the viscosity of the fluid, the smaller the inner diameter of the fluid tip. Generally, five considerations are involved with selecting the correct gun nozzle and tip:

- type of gun,
- size of object to be coated,
- desired line speed and finish quality,
- type and viscosity of coating, and
- available air volume and pressure.



CASE STUDY: Ethan Allen / Old Fort, North Carolina

Traditionally, spray gun operators were trained on-the-job by a co-worker. Old Fort reevaluated this approach and implemented a more formal training. Benefits of the formal training program included reduced overspray, material use and air emissions, and a higher quality finish. Coating use was reduced by approximately 10 percent.

Source: Case Study: Ethan Allen, Inc., North Carolina Waste Reduction Resource Center, December 1993.

Remember, increasing TE means you **use less coating for the same job and save money!** Ask your equipment supplier to help you determine the correct tip and nozzle size, the correct equipment settings, and the best operator technique for your production process. Then make sure that your operator is always using the correct settings and techniques. Some manufacturers evaluate spray technique and coating use when determining pay incentives and raises.

Proper spray gun setting and operator technique can improve finish quality on the first try, reducing the need for rework. In addition, operators typically perform their own line, gun and spray booth cleaning, so training can reduce the use of cleaning solvents as well.

More Efficient Spray Guns

High volume low pressure (HVLP) spray guns have a TE of 40 to 60 percent in practice. This means that about half the amount of coating is needed to coat the same object when a conventional air spray gun is replaced by a HVLP gun. In addition to reducing overspray, HVLP guns generate less coating bounceback, reducing operator exposure to potentially harmful solvents.

HVLP guns are portable and easy to clean. They provide good coverage and performance, and are good at penetrating recessed areas. HVLP guns cost approximately \$300 to \$600 and can pay for themselves in just a few weeks or months through reduced coating use. There can be a significant variation in TE among different HVLP gun manufacturers, so it is important to test guns from several different manufacturers.



CASE STUDY: Ethan Allen / Beecher Falls, Vermont

Beecher Falls replaced their remaining conventional air spray guns with HVLP guns and realized a 39 percent reduction in the quantity of coating sprayed from the new guns, for a payback period of 3 weeks.

Source: The complete text of the Beecher Falls Case Study can be obtained from NEWMOA at (617) 367-8558.

High Solids Coatings

Traditional nitrocellulose-based sealers and topcoats are 25 percent solids or less, meaning that 75 percent or more of the coating you purchase evaporates and is wasted even if your TE is 100 percent! Low solids content combined with typical spray gun TEs means that **only a small percentage of the coating you buy actually remains on your finished piece**. For example, a 25 percent solids coating applied with a TE of 25 percent means that only 6 percent of the original gallon of coating remains on your finished piece and 94 percent is wasted to evaporation and overspray. One way to reduce this waste is to raise the solids content of the coatings you use. There are numerous benefits to increasing the solids content to 35 percent or more:

- facilities that have increased solids content report that the final product is of higher quality and appeal to customers;
- one application can place twice the solids on an item, so fewer finishing steps are needed to produce the same final product;
- although on a per-gallon basis high solids coatings might be more expensive, less is needed so overall costs are the same or lower;
- harmful air emissions could be reduced by 50 percent or more; and
- application technique, repair and cleanup requirements are similar to traditional low-solids coatings.



CASE STUDY: Ethan Allen / Beecher Falls, Vermont

The Beecher Falls plant makes several styles of high-quality bedroom and living room furniture. Beecher Falls switched to 35 percent solids sealer and topcoat. One topcoat application instead of two is needed, reducing topcoat use and associated HAP and VOC emissions by approximately 55 and 28 percent, respectively, and saving the labor of the two spray operators and two sanders associated with the second coat.

Source: The complete text of the Beecher Falls Case Study can be obtained from NEWMOA at (617) 367-8558.

Alternative Coatings

What better way to avoid all the regulatory requirements, potential health effects, and risks of fire and future environmental liability associated with the use of a solvent-based finishing system than to switch to a different type of coating?

Several firms in New England and throughout the country have successfully switched to waterborne coatings. You may have heard mixed reviews or complaints about waterborne coatings in the past. However, the finish look and performance of waterborne coatings have improved dramatically in just the past couple of years, and they are worth investigating for yourself today.



CASE STUDY: New England Woodcraft / Forest Dale, Vermont

New England Woodcraft manufactures oak and cherry furniture for the military, college and retail markets. Following a fire that destroyed their plant, they switched to acrylic water-based emulsion sealers and topcoats. VOC emissions were reduced by over 80 percent, despite the doubling of production. Hazardous waste generation was cut from 2 55-gallon drums per week to only 3 drums per year. Fire insurance premiums were also cut in half.

The conversion process was time and resource intensive, requiring extensive pilot testing. However, New England Woodcraft's owner believes "...the economics of the two coating systems may be a wash. The water-based formulations cost more per gallon than nitrocellulose, but you get more mileage out of them; their solids content is higher. We'll also save on insurance and any future taxes on VOCs. And how are you going to put a price on employee health and attitude?"

Sources: "Getting the Most from Water-based Finishes," Furniture Design & Manufacturing, January 1991 and "Environmentalism Pays Off for Brandon Company," Rutland Herald, April 17, 1996.

There are many benefits associated with waterborne coatings:

- solids content is often higher so overall cost is the same or less than solvent-based coatings;
- finish is more durable than solvent-based coatings;
- cleanup uses soap and water;
- low flammability means there are no restrictions on storage, no explosion hazards, and lower fire insurance premiums; and
- waterborne coatings emit substantially fewer toxins, so large ventilation air flows are not needed, saving you money on utilities, especially in the winter.



CASE STUDY: Moot Wood Turnings / Northfield, Vermont

Moot Wood Turnings manufactures custom wood products and components that have a single finishing coat. Although some lacquer is applied by spraying or tumbling, approximately 90 percent is dip-coated. Primarily for safety reasons, the company switched to water-based lacquer.

The benefits include:

- harder, more resistant finish;
- toxic solvent content decreased from over 50 percent to less than 15 percent and HAPs were eliminated from the new formulation;
- water-based lacquer is not flammable so no restrictions on storage, and fire insurance rates decreased;
- 60-70 percent reduction in hazardous waste generation offsets increased per-gallon cost of coating; and
- \$800 per year savings in fees associated with reporting required under Tier II Community Right-to-Know.*

*For more information about Tier II Community Right-to-Know requirements, contact the U.S. EPA Region I Small Business Ombudsman at (617) 565-3230.

Source: Vermont Agency of Natural Resources, Environmental Assistance Division, 1998.



CASE STUDY: J.K. Adams Company / Dorset, Vermont

J.K. Adams manufactures wooden housewares, such as cutting boards and knife storage racks. They have successfully switched approximately 75 percent of their coatings to waterborne formulations that are applied with HVLP guns. J.K. Adams has also installed an innovative new spraybooth that contains reusable filters made of high density polyethylene.

The changeover to waterborne coatings took several years of working with coating suppliers, equipment vendors and customers. However, by switching to waterborne coatings, J.K. Adams was able to avoid the need to obtain an operating permit from the state air pollution control program and they should be able to lower hazardous waste generation to **Conditionally Exempt Generator (CEG) status**.

Source: Vermont Agency of Natural Resources, Environmental Assistance Division, 1999.

Several manufacturers in New England and throughout the country have also successfully switched some of their finishing to **ultra violet (UV)-cured coatings**. UV-cured coatings are typically applied using an automated system and therefore are most applicable to finishing flat wood, such as furniture components prior to assembly.



CASE STUDY: Vermont Tubbs / Brandon, Vermont

Vermont Tubbs Inc. manufactures bedroom furniture in ash, cherry and maple. In 1999, they installed an automated UV-curing roll coating system to finish solid wood drawer components. Prior to the switch, these components were spray coated with a nitrocellulose lacquer that contained almost 4 pounds of VOCs per gallon. The UV-cured system is expected to cut overall VOC emissions from the facility by approximately 10,000 pounds per year. This is particularly important to Vermont Tubbs because they are experiencing significant growth and were approaching the VOC emission limit set in their state air permit to operate.

In addition to the environmental benefits, Vermont Tubbs sees several other advantages associated with the UV-cured system:

- UV-cured coating is more durable and has a higher film thickness
- labor requirements are reduced
- floorspace requirements for drying boards are significantly reduced

The capital cost to purchase and install the new system was approximately \$150,000. However, Vermont Tubbs estimates that labor and material costs have been reduced from \$1.50 per unit to just \$0.60 per unit.

Source: Vermont Agency of Natural Resources, Environmental Assistance Division, 1999.

There are many benefits to using a UV-cured coating system:

- full curing occurs within seconds of exposure to UV lights, enabling fast production rates and eliminating the need for flashoff space
- VOC and HAP emissions are virtually eliminated, reducing or eliminating regulatory burdens
- fire and explosion hazards are eliminated, reducing insurance costs
- ventilation requirements are lower, reducing utility costs
- the as-applied coating cost can be lower
- UV-cured coatings are extremely durable
- UV-cured coatings will not cure unless exposed to UV light, reducing cleanup requirements.



CASE STUDY: Great Brook Furniture / North Springfield, Vermont

Great Brook Furniture (GBF) manufactures furniture and furniture components from various hard and soft woods, and also from medium density fiberboard. In 1998 they installed an automated UV-cure roll coating system to finish flat panel wood products. The system does not create overspray and has no filters. Therefore, hazardous waste generation has been significantly reduced. The new system cost approximately \$145,000. However, GBF expects to recoup this investment after only 2 years because of the increased production capacity, and the reductions in labor requirements, overall coating cost and hazardous waste generation.

Source: Vermont Agency of Natural Resources, Environmental Assistance Division, 1999.

Your vendor might suggest that you switch to so-called "compliant coatings" as a way to avoid air regulations. However, many of the chemicals in "compliant coatings," including acetone, are HACs and subject to regulation under Vermont's Air Pollution Control Program. **Switching to so-called "compliant coatings" does not automatically mean that you do not have any regulatory obligations** or that the coatings are non-toxic. For example, "compliant coatings" are often formulated using acetone. Exposure to acetone can be harmful to human health. Acetone is also more flammable than many other solvents, increasing fire and explosion hazards and most likely, fire insurance rates as well. Acetone is more volatile than most other solvents, creating potential quality problems because the coating dries too quickly. Furthermore, the smell of acetone is not pleasant for employees. **Just because a coating is called a "compliant coating," that does not necessarily mean it is a safe-to-use coating.**

Reducing Hazardous Waste

Some of the best ways to reduce your generation of hazardous wastes were presented in the Reducing Air Emissions section. When spray guns are used, improving operator technique and equipment settings, and/or buying more efficient application equipment will reduce the amount of overspray generated. When you reduce overspray, you lengthen the life of spray booth filters, generate less lacquer dust, and generally use less cleaning solvents. No matter which application technique is used at your facility, spray gun, dipping or brushing, **switching to an alternative coating, such as waterborne or UV-cure can often reduce hazardous waste generation.**



CASE STUDY: T. Copeland & Sons / Bradford, Vermont

T. Copeland & Sons manufactures maple and cherry bedroom and office furniture. They were able to reduce hazardous waste generation and become a Conditionally Exempt Generator (CEG) even though production has steadily increased. In addition to switching to higher solids coatings and HVLP spray guns, T. Copeland & Sons implemented the following improvements:

- purchasing a closed-system gun washer that reduced waste solvent generation by over 65%
- providing ongoing training to operators to maximize the efficiency of the HVLP guns when coating formulations change
- experimenting with fluid nozzle and air caps to minimize overspray, reducing this wastestream by over 320 pounds a year
- reusing approximately 85% of the coating remaining in the pressure pot from the previous day by adding an equal or greater amount of uncatalyzed virgin material
- having a qualified laboratory perform waste profile testing on certain overspray materials that determined that the material did not exceed regulatory thresholds for ignitability and certain toxics and, therefore, could be managed as a solid waste

Source: Vermont Agency of Natural Resources, Environmental Assistance Division, 1999.

There are several other ways to reduce solid and/or hazardous waste generation, including:

- send your rags to a commercial laundry,
- implement an inventory control system, and
- collect and reuse cleaning solvents.

Commercial Laundry

By definition, rags that are used with solvent-based coatings are a hazardous waste and must be transported and disposed of accordingly, at great expense. However, **if the rags are sent to a commercial laundry for cleaning and reuse they are exempt from regulation as a hazardous waste.** By reusing your rags, you will not have to buy as many new rags and you will also avoid the costs associated with handling the rags as a hazardous waste. In addition, you'll be in compliance with the regulations. Just make sure you store the used rags in a metal container that is labeled and covered and that there is no free liquid in the container when it is shipped to the laundry. Before placing your used rags in the metal container, wring out as much solvent as possible and reuse it! See the Shop Rags Fact Sheet for more information.

Inventory Control System

Controlling the purchasing and handling of materials can reduce waste generation significantly. When you develop a log out system and assign one person the responsibility of retrieving needed materials from your storage area, you can track where materials are used and in what quantities. In addition, operators become less wasteful in their use of materials when they don't have open access to the storage area and they know someone is recording material use.

Coatings that have passed their expiration date become a waste and should not be used. Therefore, you should purchase coatings in as small a quantity as possible to avoid exceeding expiration dates. You should also label incoming materials with shelf life dates and have a first-in, first-out policy. Lastly, you should work with your supplier(s) to take back off-spec and empty containers, if possible.

Solvent Reuse

When spray gun application is used, spent cleaning solvents are generated from gun and line cleaning, and spray booth cleaning. Solvents are also used for cleaning when coatings are applied by brushing and dipping. The Vermont DEC classifies spent solvents as a hazardous waste. You might think the cheapest and easiest thing to do is simply let the solvents evaporate. However this is an illegal form of waste treatment and releases harmful chemicals into the air for you, and your employees and neighbors to breath. In addition, you are wasting a valuable resource. Collecting and reusing solvents as much as possible can lower virgin solvent purchases and hazardous waste disposal costs for spent solvents. A small distillation unit can produce recycled solvent that is appropriate for use in a variety of applications.

CASE STUDY: T. Rocky Mountain Furniture Restoration / Bozeman, Montana

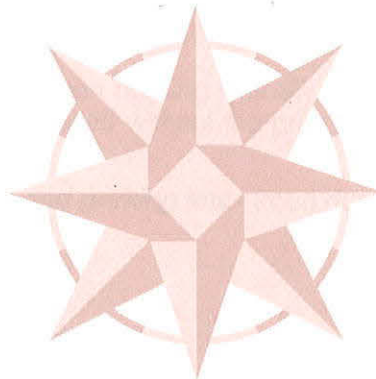


Rocky Mountain reduced consumption and disposal of thinners and strippers through the use of a solvent distillation unit. Payback was only seven months and the company now saves \$3,500 -\$4,000 per year on new solvent and waste disposal costs.

Source: Pollution Prevention for Montana Wood Finishers, Montana Pollution Prevention Program, September 1997

Appendices

- A. Air Pollution*
- B. Floor Drains*
- C. Recyclable Materials*
- D. Shop Rags*
- E. Spills*
- F. Used Oil*



Air Pollution

What is air pollution?

Air pollution can be defined simply as the presence in the outdoor air of any air contaminant in such amounts that may cause harm or interfere with the enjoyment of life. Air pollution can come from both natural sources (forest fires, volcanic eruptions and plants (ie. pollen)) and man-made sources (factories, automobiles, and dusty roads) and includes such contaminants as suspended particulates, dust, fumes, exhaust, smoke, chemicals and odorous substances. Identifying which activities cause air pollution is the first step towards cleaner and healthier air for everyone to breath.

Does wood products manufacturing cause air pollution?

Wood products manufacturing encompasses a wide variety of operations, from rough milling operations to the finishing of fine furniture. Many of these operations can cause air pollution, including:

- ➔ **Finishing operations** - The solvents from spray finishes evaporate and end up in our air. Conventional coatings typically contain 5-10 pounds of volatile organic compound (VOC) solvents per gallon of coating. These solvents can react in the atmosphere to form "smog" and are also of concern due to their toxicity.
- ➔ **Wood working operations** - While the sawing of green wood is typically not a concern, the sawing, planing, and sanding of kiln dried wood can create fine particles of wood dust that can remain suspended in the air.
- ➔ **Gluing operations** - Many glues contain hazardous components that evaporate into the air, including formaldehyde.
- ➔ **Boilers and furnaces** - Wood and oil fired boilers and furnaces generate air pollution. Wood boilers require diligent attention to their operation to ensure proper combustion and to minimize smoke and other pollution.
- ➔ **Diesel engine generators and idling trucks** - Diesel engines have some of the highest emission rates of all combustion sources. Diesel particulates that give diesel exhaust its characteristic odor are of significant concern due to their toxicity.
- ➔ **Open burning of scrap wood wastes** - Open burning typically results in poor combustion efficiency and visible smoke. Open burning is prohibited without the prior written approval from the Air Pollution Control Division ("APCD").
- ➔ **Road dust from unpaved traffic areas and parking lots** - Road dust can be a respiratory irritant and cause a nuisance to the general public.

How are emissions from these facilities regulated?

The Vermont Air Pollution Control Regulations ("Regulations") establish limits on emissions for numerous air polluting activities and requires permits for larger sources. Regardless of the need for a permit, facilities are prohibited from emitting visible emissions (such as from boilers, diesels engines, dust collection systems etc.) in excess of the specified levels and from causing a nuisance or odor to the general public. Pollution control measures must also be taken to minimize particulate emissions, such as the use of a fabric filter on wood dust collection systems and the use of calcium chloride on unpaved traffic areas at the facility to minimize dust. Any existing diesel engine greater than 450 hp is required to be upgraded to meet new emission standards by July 1, 2007. Facilities must also quantify their emissions of individual hazardous air contaminants such as from the gluing and finishing operations and compare them to the regulatory action

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levels in the Regulations to determine if emission reduction measures are required. If air pollution emissions from the facility exceed 5 tons per year, the facility must notify the APCD and register those emissions annually. A fee is assessed based on the amount and toxicity of emissions.

Air pollution permits are typically only required for larger facilities where the level of emissions is more of a concern and additional pollution control measures may be required. Facilities with air pollution emissions less than 5 tons per year typically do not require permits provided the facility is in compliance with the Regulations for visible emissions, wood dust and hazardous air contaminant emissions. If you use more than 1,000 gallons per year of coatings a permit may be required. You should contact the APCD for more information.

Pollution Prevention Opportunities and Best Management Practices

- ③ Use high solids finishes where feasible such as for sealers and topcoats.
- ③ Choose finishes low in VOCs and hazardous air pollutants. Consult your products supplier or call the APCD if you have questions.
- ③ Convert conventional spray guns to high volume-low pressure (HVLP) guns to increase transfer efficiency and reduce overspray and coating usage.
- ③ Explore alternative coating technologies such as waterbased coatings or UV cured coatings.⁵ Collect and recycle spray gun and line cleaning solvents. Don't spray them into booths to evaporate.
- ③ Use strippable spray booth coatings to minimize solvents for cleaning.
- ③ Don't use raincaps unless absolutely necessary. They prevent upward dispersion and increase chances of offsite odor or nuisance problems.
- ③ Install fabric filter dust collectors for pneumatic collection of all wood wastes (required for sander dust). Returning the air indoors conserves heat in the winter and alerts you to possible maintenance problems right away.
- ③ Don't pneumatically reconvey wood dust wastes after they have been collected unless a closed loop system is used that returns the conveying air back to the blower inlet. Use augers where possible and cover them to prevent wind blown dust if outdoors. Store wood dust wastes in silos or four sided building enclosures. Drop loading of wood wastes from a storage area into trucks should also be done in a four sided enclosure.
- ③ Keep combustion equipment tuned up and watch your stacks for visible smoke emissions that could indicate a problem.
- ③ Don't burn your own wood wastes unless you are committed to ensuring proper combustion at all times. Wood fuel burning equipment is prone to smoking and causing a nuisance unless designed and operated correctly. Do your research before buying a unit. It could save you a lot of headaches and regulatory problems down the road.
- ③ Don't burn woodwastes unless there is a need for the heat. This is considered "incineration" and is subject to stringent air pollution control requirements. Store the material until it is needed or sell it for fuel or animal bedding.
- ③ Don't burn plywood, particle board or MDF. It can cause toxic emissions.
- ③ Maintain a consistent quality fuel for wood boilers by keeping the various wood waste fuels uniformly mixed. Most boilers can not compensate for the various sizes, moisture contents and heat values of wood wastes and the boiler operator must be attentive to ensure proper, smoke free combustion. A boiler set up to burn dry, hardwood, hogged wastes will not work well on green softwood chips or sawdust.
- ③ Use diesel generators only for emergency backup. Use of diesels for other than emergency backup (ie. utility peak load shedding) will likely require a permit and an extensive air quality impact review.
- ③ Apply calcium chloride to unpaved traffic areas on site as necessary to minimize road dust.
- ③ Location, location, location. If located near residences, even small wood working shops are prone to impacting their neighbors with noise, dust, smoke or solvent odors. Consider locating in an industrial park or isolated location to minimize impacts on neighbors. Remember, the Regulations prohibit a facility from causing a nuisance or odor beyond the property line.

Floor Drains

How are they regulated ?

Discharge of fluid wastes from floor drains to the subsurface (leach field, drywell, etc) by businesses are regulated as Underground Injection Control (UIC) Wells. The discharge of fluid wastes from floor drains to the ground surface is a practice referred to as *day-lighting*. In either case, the activity is regulated by the Wastewater Management Division. Floor drains are subject to the Floor Drain Procedure signed by the Commissioner of the Department of Environmental Conservation (DEC) in October, 1993.

Day-lighting

Floor drain discharges to the ground surface are generally **prohibited** where drains are located in areas where hazardous materials are used or stored. Approval to day-light must be obtained from Regional Office of the Wastewater Management Division in your area.

Injection Wells

All floor drains discharging to injection wells pose some risk to groundwater quality. Accordingly, the construction of a **new** floor drain in an area where hazardous chemicals are used or stored *is prohibited* unless the floor drain is connected to a public sewer or to a holding tank. Most wood coatings, and certainly those containing organic solvents or any such solvents used for thinning or cleaning purposes, are considered hazardous materials. Permission to connect to a holding tank or the public sewer must be obtained from the Wastewater Management Division's Regional Office prior to construction. If a holding tank is used, wastewater can be disposed of at the municipal wastewater treatment facility (if they agree to accept it) or via a certified hazardous waste hauler. In either case, you'll likely have to test to see if the wastewater meets the definition of 'hazardous' in the Hazardous Waste Management Rules.

All businesses with **existing** floor drains that discharge to the subsurface are required to register their floor drains with the Wastewater Management Division in Waterbury, VT. Contact 241-4455 to request a registration form.

In accordance with the 1993 Floor Drain Procedure signed by the Commissioner of the DEC, the Wastewater Management Division will develop a **procedure that will require the eventual permanent closure of any floor drain located in an area where hazardous materials are used or stored**, unless it is connected either to a public sewer system or to a holding tank. As with new construction, the Regional Office of the Wastewater Management Division must be contacted prior to discharge to either a holding tank or public sewer. The schedule for closure and acceptable means for accomplishing closure will be addressed in the pending procedure. When the procedure is adopted, registered floor drain owners will be notified of the requirements.

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Floor drains discharging to UIC wells located in areas where hazardous materials are not used or stored, may be eligible to receive a permit. For example, while exterior vehicle washing is permissible under the Procedure, it is unlikely that car wash facilities in general would qualify for a UIC permit due in part to the significant volume of wastewater typically generated by a car wash. No permit will be issued for "under the hood", "under vehicle", heavy equipment, or parts washing. It is likely that any permit issued for such restricted vehicle washing would require that floor drains have both grit traps and oil-water separators prior to any wastewater discharge to the subsurface. The permit might also specify a maintenance schedule for traps and separators, as well as periodic environmental monitoring for contaminants.

Best Management Practices

Overall Strategy

- ➔ Floor drain elimination is strongly recommended in areas where hazardous materials are used or stored. But, if that is not possible, the Wastewater Management Division may allow you to utilize the system when you have shown that you can:
 - ➔ Keep floor drains plugged when not being used for an allowable purpose;
 - ➔ Keep storage of hazardous materials or other synthetic fluid products in an area as remote as possible from where the floor drain is located;
 - ➔ Keep floors as clean as possible .
- ➔ Re-route the floor drain to a municipal sewer line where available and where acceptable to the municipality. You must be certain that your wastewater is not a hazardous waste. Adding grit removal and oil/water separation is suggested and may be required by the municipal wastewater facility.
- ➔ Collect the wastewater in a storage tank and dispose of via a local wastewater treatment facility if available and acceptable to the municipality. You must be certain that your wastewater is not a hazardous waste. Use and maintain grit removal and oil/water separation to insure a 'clean' wastewater.
- ➔ Use and maintain grit removal and oil/water separation prior to discharging to an on-site injection well (or leach field) to insure a 'clean' wastewater. Understand that ground water standards must be met.

Recyclable Materials

Why are they Regulated ?

Over the past decade, the Vermont Legislature has enacted laws to reduce the volume of trash going to landfills in the state and to help cities and towns save money by recycling. The recyclable materials are: (1) Cardboard, including corrugated and boxboard (2) glass containers (3) compostable yard and food waste (4) newsprint (5) office paper (6) steel and aluminum cans (7) plastic containers made of HDPE, PET, and PVC. Today, over half of Vermont's population lives in one of the 99 towns with mandatory recycling ordinances. An additional 147 towns offer recycling on a voluntary basis.

How Should They Be Managed ?

Source separated materials are recyclable, just like those that are landfill banned. Check with your waste hauler, town clerk or solid waste district to find out if your town has mandatory recycling and what materials can be recycled in your town.

Addison County Solid Waste Management District	(802) 388-2333
Bennington County Regional Commission	(802) 375-2576
Central Vermont Solid Waste Management District	(802) 479-4363
Chittenden Solid Waste District	(802) 872-8111
Greater Upper Valley Solid Waste Management District	(802) 649-2610
Lamoille Regional Solid Waste Management District	(802) 888-7317
Northeast Kingdom Waste Management District	(802) 626-3532
Northwest Vermont Solid Waste Management District	(802) 524-5986
Rutland County Solid Waste District	(802) 775-7209
Southern Windsor/Windham County Solid Waste Management District ..	(603) 543-1201
Windham Solid Waste Management District	(802) 257-0272

What should not be done with these materials ?

If your community has a mandatory recycling ordinance, you can't just throw your recyclables in the trash. Even in towns where recycling is voluntary, it is often costs less to recycle these materials than it does to landfill them.

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Best Management Practices

- ① Find out which materials must or may be recycled in your town
- ② See if your waste hauler offers separate containers and/or rates for recyclables
- ③ Separate and store recyclable materials by type (unless told otherwise)
- ④ Store recyclable materials where they will stay clean and dry
- ⑤ Choose to purchase or carry products which use less packaging
- ⑥ Buy in bulk or in returnable containers
- ⑦ Talk with scrap metal dealers. They may pay for some materials and/or pick them up at no charge.

Shop Rags

How Are They Regulated ?

Wipers, shop towels, and other reusable absorbents that are contaminated with "listed" hazardous waste or that exhibit a hazardous waste "characteristic" are by policy considered to be exempt from the provisions of the Vermont Hazardous Waste Management Regulations if the following management practices are followed:

- ➔ the hazardous waste-contaminated reusable rags or absorbents are picked up, cleaned, and delivered back to the customer under a contractual agreement with a commercial laundering service which uses either a solvent-based dry cleaning or a water-based laundering process to clean the wipers/absorbents; and,
- ➔ hazardous waste has not been disposed of onto the wipers and free liquid hazardous waste is not present; and,
- ➔ hazardous-waste contaminated reusable absorbents that are on-site prior to being picked up by the laundering service are:
 - ➔ stored in closed bags or other containers on an impervious surface in a roofed enclosure (so as to be protected from the elements); and,
 - ➔ identified as being "used rags/absorbents"
- ➔ the laundering facility properly manages all residuals and waste from the laundering process.

Under this policy exemption—provided that all of the above management requirements are met—reusable absorbents that have been soiled with hazardous waste(s):

- ➔ would not have to be managed as hazardous waste when at the generator's facility (although they must be stored as outlined above); and,
- ➔ do not need to be shipped under a manifest to a licensed hazardous waste Treatment, Storage, or Disposal facility; and,
- ➔ do not count toward the total monthly on-site generation of hazardous waste.

NOTE: It is the generator's responsibility to meet all Vermont Occupational Safety & Health Act (VOSHA) requirements regarding the storage of hazardous materials, for example; reusable absorbents contaminated with an ignitable material must be stored in a metal container.

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Spills

What Are They ?

A spill is an accidental release of a hazardous material *to the environment*. For example, three gallons of thinner that is spilled on an impermeable floor that ends up going down the floor drain which leads directly to a storm drain or dry well must be reported, whereas the same three gallons, captured, contained and recovered before it can be released to the environment, does not need to be reported.

When Is Reporting Required ?

Any spill of petroleum that results in a release to the environment of 2 gallons or more must be reported as soon as possible to the Waste Management Division at 241-3888 during normal working hours or by calling the 24-hour emergency number at 244-8721 or 1-800-641-5005. Spills of hazardous materials **other than petroleum** must be reported where the environmental release exceeds 2 gallons **OR** any amount that poses a potential threat to health or the environment.

In the event of a spill:

- ➔ Contain the flow of material by using a bucket, barrier, temporary dike, channels or other containment vessel to make cleanup and recovery easier. **Don't let it enter floor drains.**
- ➔ Recover liquids for recycling if possible, otherwise properly dispose of. One suggestion is to use an explosion-proof wet vac or squeegee to collect as much of the liquid as possible. This will minimize the amount of material that has to be placed in the hazardous waste drum. If you rely on absorbents, (speedi-dri, pads, "magic sorb", etc) use up as much as possible. Contaminated absorbents must be properly disposed of as a hazardous waste.

Best Management Practices

- ➔ Develop a basic spill prevention plan that addresses some of the following items. Involve employees as they may be the most knowledgeable regarding how and why spills sometimes occur.
- ➔ Maintain spill control and containment equipment in a designated area.
- ➔ Instruct employees in proper spill response procedures, including basic safety precautions like :
 - ➔ Minimize touching or walking in spilled material;
 - ➔ Minimize inhalation of any resulting gases, vapors or smoke;
 - ➔ Wash promptly if skin comes in contact with material.
- ➔ Post a list of emergency numbers next to the phone.
- ➔ Use drip trays, funnels or other means when transferring liquids.
- ➔ Use spring-loaded covers, valves or other positive shut-offs to prevent the accidental discharge of hazardous materials to floor drains.

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Used Oil

How is it Regulated ?

Used oil is regulated under Subchapter 8 of the Vermont Hazardous Waste Management Regulations. Used oil does not count towards annual hazardous waste generation totals nor does it require a manifest for transportation off-site so long as it is managed in accordance with Subchapter 8 standards. [Used oil includes all machine oils and crankcase oils. It may include transmission, hydraulic and power steering fluids.]

What can be done with it ?

- ➔ **Send it** off-site to be fuel-blended and burned for energy recovery **OR** to be re-refined for reuse as a lubricant.
- ➔ **Re-use it** for undercoating vehicles, lubricating chains, tools and other machinery. Don't let it drip on the ground.
- ➔ **Burn it** on-site as a fuel in a waste oil furnace for space heating, provided :
 - ➔ Furnace has maximum operating heat input less than 500,000 BTU/hour and combustion gases are vented to the outside;
 - ➔ Oil must come from either a vehicle crankcase or machine gearbox only. (It may be mixed with virgin fuel oil).
(Other types of specification used oil, like transmission, hydraulic or power steering fluid, may be burned pending approval by the Waste Management Division Approval is case-by-case and is based on a review of relevant Material Safety Data Sheets, if available, and a narrative description of the process generating the used oil.
 - ➔ Oil must meet "specification". This can be accomplished using "generator knowledge" that the oil does not exceed the specified level for any constituent shown in the table on the back of this page **AND** a one-time test for total halogens is performed to assure that the concentration is less than 1000 ppm. A field screening test may be used to determine halogen content. Oil may be accepted from do-it-yourselfers.
 - ➔ Oil must not be burned in "pot burners" or "vaporizing burners". The use of this type of fuel burning equipment is prohibited.
- ➔ **Give or sell it** to others as a fuel, provided :
 - ➔ All of the criteria in "Burn it" above apply, **AND**
 - ➔ If oil is shipped/received in quantities **>55 gallons at a time**, then oil must be tested to assure it meets specification for *all* of the parameters in the following table;
 - ➔ Both the shipper and the receiver must notify the Waste Management Division at 241-3888 and keep records as required.

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Constituent/Property	Allowable Level
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Chlorine	500 ppm maximum
Lead	100 ppm maximum
Flash Point	140°F minimum
Total Halogens	1,000 ppm maximum
Polychlorinated biphenyls (PCBs)	<2 ppm maximum
Net Heat of Combustion	8,000 BTU/lb minimum

What Can't Be Done With It ?

- Used oil cannot be disposed of in a Vermont landfill. (Check with the Solid Waste District in your area to see if they have a collection program for small businesses)
- Used oil cannot be applied to roads for dust control.
- Used oil cannot be mixed with a hazardous waste. It can be blended with an off-specification used oil such that the resultant mixture meets specification.

How do I Store Used Oil ?

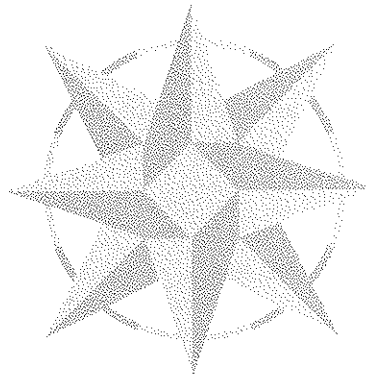
- If Stored **Above-ground** ensure that tanks or containers are:
 - ⇒ In good condition and made of or lined with compatible materials;
 - ⇒ Kept closed except when adding or removing used oil;
 - ⇒ Labeled with the words "Used Oil"
 - ⇒ Located on an impervious surface within a structure that sheds rain and snow;
 - ⇒ Up to 1,320 gallons may be stored on-site before arrangements to ship must be made **UNLESS** oil is for on-site heating, in which case, up to 50% more than amount needed for heating can be stored.
- Tanks located outdoors must be equipped with secondary containment able to hold 110% of the tank's volume.
- If Stored in an **Underground Storage Tank**, contact the UST Program (241-3888) to obtain a permit.

How Do I Transport Used Oil ?

Used oil generators can self-transport up to 55 gallons at any one time in a Dept. Of Transportation approved container without obtaining a permit. "Used oil transporters" of more than 55 gallons must notify the Waste Management Division (241-3888) to obtain a permit.

Appendices

- A. Actual VOC Emission Calculations*
- B. List of Hazardous Air Contaminant*
- C. Hazardous Air Contaminant Calculations*
- D. Hazardous Waste Notification Form and Instructions*
- E. Example Hazardous Waste Manifest*
- F. Information and Assistance Resources*



Appendix A: Actual VOC Emission Calculations

How to Calculate Your Actual VOC Emissions

- ① The first step is to **gather your Material Safety Data Sheets (MSDS)** for all coating, gluing, washoff and cleaning materials used at your facility. An actual MSDS for a solventborne *Compliant Sealer* is attached for your reference throughout this section. You may want to refer to the "A Quick Guide to Reading a Material Data Safety Sheet" at the end of this Appendix for a brief overview of what type of information is contained in each section of an MSDS.
- ② The next step is to **determine the total number of gallons** of each different type of VOC-containing material you use in a year. For example, let's say that your facility uses approximately 8 gallons each day of the *Compliant Sealer*. There are an average of 250 work days per year¹ so that is 2,000 gallons of *Compliant Sealer* each year ($8 \times 250 = 2000$). Repeat this step for *each* of the materials you use. You might find it helpful to record your results in a table similar to that included in this Appendix.
- ③ The next step is to **find the information you need** to determine the VOC content of each of the materials you use. Hopefully the MSDS will provide you with the "VOC lbs/gal."² If not, you will have to calculate it using two pieces of information: the coating density (the total weight of one gallon) of the coating and the % volatile (or %VOC) by weight.³ See Section 2 or 3 of the MSDS to find this information. Some compounds are volatile but are not considered VOCs, therefore it is better to use %VOC by weight, if available. If the MSDS does not provide %VOC you should assume that all the % volatiles are VOCs. You determine the pounds of VOC per gallon by multiply the coating density by the % VOC (or volatile) by weight.

For the *Compliant Sealer*, the information needed is contained on page 2 in Section III. The coating density is 8 pounds per gallon and the % volatile by weight is 68%. For the *Compliant Sealer* the pounds of volatiles per gallon is $0.68 \times 8 = 5.44$ pounds per gallon.

¹ Assumes: (5 days per week x 52 weeks per year) - 10 holidays = 250 work days per year

² Sometimes the MSDS provides "VOC lbs/gal less water" or VOC lbs/gal less exempt compounds." Due to the way these values are calculated they are not appropriate for calculating actual emissions from the coatings. You should contact your supplier to obtain the actual "VOC lbs/gal." The other values are provided to show compliance with certain state or federal requirements that limit the total amount of VOC allowed in a specific coating and prevent bringing a coating into compliance simply by "watering" it down with water or another exempt solvent.

³ Note: Sometimes the coating supplier lists specific gravity instead of coating density. You calculate the coating density in pounds per gallon by multiplying the specific gravity by 8.34 (the weight of a pound of water). If the specific gravity listed on the MSDS uses a reference other than water, you need to use the density of that reference compound. Unless specified otherwise, you should assume that the specific gravity reference is water.

Example: if Specific Gravity = 0.96
 then the coating density = 0.96×8.34 pounds/gallon = 8 pounds/gallon

However, the *Compliant Sealer* contains some volatile material (acetone) that is not considered a VOC. You would not normally know that, so the supplier has provided pounds of VOC per gallon right on the MSDS in Section III, under VOC (Exempt) = 4.6655 pounds per gallon.⁴

Repeat Step 3 for *each* of the materials you use.

- ④ The next step is to determine the **total pounds of VOC emissions in a year from each material** you use.

$$\text{Formula: } \text{VOC} = \text{Gallons} \times \text{VOC}_{\text{Density}}$$

Where: VOC = The actual VOC emissions from the material (in pounds) for the year.
Gallons = The total yearly usage of the material in gallons (from Step 2)
VOC_{Density} = The VOC density of the material in pounds of VOC per gallon (from Step 3)

Compliant Sealer Example:

$$\begin{aligned} \text{VOC} &= [2,000 \text{ gallons} \times 4.6655 \text{ pounds/gallon}] \\ \text{VOC} &= 9,331 \text{ pounds of VOC emissions per year} \end{aligned}$$

You need to repeat this calculation for *each* material you use.

- ⑤ The final step is to determine the **total amount of VOC emissions from your facility each year**. To do this you need to add up all the individual material calculations you did under Step 4. This will give you total pounds of VOC emissions per year. Then you need to divide this total by 2000 (pounds per ton) to obtain your actual VOC emissions in tons per year.

NOTE: If your actual VOC emissions are 5 tons per year or more, you must register with the DEC Air Pollution Control Division. Contact them at (802) 241-3840 for more information.

It is not difficult for a small- to medium-sized facility to have actual VOC emissions above 5 tons per year. At a use of 8 gallons per day, the *Compliant Sealer* alone contributes 4.6655 tons of VOC emissions per year - almost reaching the threshold by itself! And this example coating is a "compliant" sealer - many sealers have a higher VOC content. In addition, most facilities apply more than one coating - therefore, even if you use less than 8 gallons per day of sealer, you could still exceed the 5 tons per year threshold when the VOC emissions from all your coatings are added together.

⁴

For the *Compliant Sealer*, the %VOC is equal to the 68% volatile (from Section III) minus the 9.68% acetone (found in Section II-A). $68.0 - 9.68 = 58.32\%$ VOC. The VOC per gallon is 58.32% of the 8 pounds per gallon total weight (from Section III). $8 \times 0.5832 = 4.6655$ pounds VOC per gallon.

Example of a Table to Record VOC Emission Calculation Information

Coating name	Gallons used each year	VOC content (lbs./gal)	VOC emisisions (lbs./yr.)
Example: <i>Compliant Sealer</i>	2,000	4.6655	9,331
Total Emissions (lbs.)			
Total Emissions (tons)			÷ 2,000 =

Where:

Gallons used each year = gallons used per day X 250 work days per year¹
 Example: 8 gallons per day X 250 = 2,000

VOC content = pounds of VOC per gallon of material
 obtained either: 1- directly from the MSDS
 2- calculated using the total weight of the coating (coating density) multiplied by the %VOC (or % volatile)
 Example: 8 pounds per gallon X 58.32% VOC =
 4.6655 pounds of VOC per gallon

VOC emissions = total VOC emissions from the coating per year
 Column 2 multiplied by Column 3
 Gallons used each year X VOC content
 Example: 2,000 gallons per year X 4.6655 pounds VOC per gallon =
 9,331 pounds of VOC emissions per year

¹ if your facility operates more or less, alter the number 250 appropriately

A Quick Guide to Reading a Material Safety Data Sheet

The information provided in the table below should help you to understand how a Material Safety Data Sheet (MSDS) is formatted and what kind of information it contains. It is always a good idea to ask vendors for a copy of an MSDS for a chemical or product BEFORE actually purchasing the product. This will allow you to evaluate the product and compare it to others that perform a similar function. By doing this you can select the product or chemical that represents the least hazard to your employees and will result in the least amount of regulation.

What is This Stuff?	
Section I: Product Identity	Allows you to match the MSDS with the product.
Section II: Hazardous Ingredients	Names the hazardous ingredients and tells you the maximum amount you can be exposed to without harm.
How Does This Chemical Behave?	
Section III: Physical Data	Helps to figure out where to store the chemical and how likely it is to evaporate and give off vapors (leading to exposure and/or fires).
Is This Product Dangerous?	
Section IV: Fire and Explosion Data	Discusses when a chemical will ignite and how to extinguish the fire.
Section V: Reactivity Data	Tells you if the substance will explode or breakdown in the presence of sunlight or air.
Can This Product Hurt My Health?	
Section VI: Health Hazards Data	Tells you how the chemical can get into your body (e.g. absorbed through the skin, inhalation, etc.) Explains what the health effects may be if you are exposed and whether it can cause cancer. It also includes first aid procedures.
How Should I Work With This Stuff?	
Section VII: Precautions for Handling	What to do in case of a spill. How to dispose of the waste.
How Should I Be Protected?	
Section VIII: Control Measures	Includes respirators, ventilation, eye protection, or special clothing.

date of prep : 02/23/99

44773 (page 1)

SECTION I

manufacturer : C.E. BRADLEY LABORATORIES, INC.
 address : P.O. BOX 8238
 N. BRATTLEBORO, VT 05304
 RICHARD S. CARLSON, CHIEF CHEMIST
 telephone# : (802) 257-7971
 emergency# : (802) 257-7971

- H M I S -

HEALTH : 1
 FLAMMABILITY : 3
 REACTIVITY : 1
 PERSONAL PROTECT.: H

product class: F00
 mfg. code id : 44773
 trade name : COMPLIANT SEALER (44773)

(HAZARD RATING : 0=least, 1=slight, 2=moderate, 3=high, 4=extreme, *=chronic)
 (H = splash goggles, gloves, synthetic apron, & vapor respirator)

SECTION II-A

HAZARDOUS COMPONENTS

component	CAS#	% by wt.	HAPS	SARA	vapor pressure (mm Hg @ 20C)	LEL (@ 25C)
1 2-HEPTANONE	110-43-0	20.74	NO	NO	2.14	1.11 @ 65 C
2 nBUTYL ACETATE(ACETIC ACID,BUTYL ESTER)	123-86-4	12.33	NO	NO	10.00	1.38 @ 38 C
3 NITROCELLULOSE	9004-70-0	12.93	NO	NO	N/A	N/A
4 ISOPROPYL ALCOHOL	67-63-0	5.54	NO	NO	30.00	N/A
5 XYLENE	1330-20-7	11.93	YES	YES	6.60	1.00
6 ETHYL BENZENE	100-41-4	3.02	YES	YES	5.40	1.00
7 TOLUENE (BENZENE,METHYL-)	108-88-3	4.76	YES	YES	24.00	1.00
8 ACETONE (2-PROPANDNE)	67-64-1	9.68	NO	NO	181.70	N/A

None of the components of this product are recognized as carcinogenic.

Under the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372, chemicals listed on the Section 313 List (40 CFR Part 373.65) are identified under the heading 'SARA 313'.

(N/A = not applicable)

SECTION II-B

OCCUPATIONAL EXPOSURE LIMITS

no.	(OSHA) PEL/TWA	PEL/CEILING	PEL/STEL	skin
1	100 ppm	N/E	N/E	N/E
2	150 ppm	N/E	N/E	N/E
3	N/E	N/E	N/E	N/E
4	400 ppm	N/E	N/E	N/E
5	100 ppm	N/E	150 ppm	N/E
6	100 ppm	N/E	N/E	N/E
7	100 ppm	N/E	150 ppm	N/E
8	750 ppm	N/E	N/E	N/E

no.	(ACGIH) TLV/TWA	TLV/CEILING	TLV/STEL	skin
1	50 ppm	N/E	N/E	N/E
2	150 ppm	N/E	200 ppm	N/E
3	N/E	N/E	N/E	N/E
4	400 ppm	N/E	500 ppm	N/E
5	100 ppm	N/E	150 ppm	N/E
6	100 ppm	N/E	125 ppm	N/E
7	100 ppm	N/E	150 ppm	N/E
8	750 ppm	N/E	1000 ppm	N/E

>> The dried film of this product may become a dust nuisance when removed by sanding, blasting or grinding.

>> (SKIN) absorption may contribute to the overall exposure to this material. Take appropriate measures to prevent skin contact.
(N/E = not established)

SECTION III

PHYSICAL DATA

boiling point	: not established	% volatile by volume	: 77.82 +/- 2%
evaporation rate	: <1 (ether = 1)	% volatile by weight	: 68.00 +/- 2%
vapor density	: >1 (air = 1)	weight per gallon	: 8.00 +/- .2
VOC	: 5.2861	VOC (Exempt)	: 4.6655

SECTION IV

HEALTH INFORMATION

EYE CONTACT

BASED ON THE PRESENCE OF COMPONENT 4 PRODUCT IS PRESUMED TO BE SEVERELY IRRITATING TO THE EYES. EXPOSURE MAY CAUSE EXTENSIVE CORNEAL INJURY. BASED ON THE PRESENCE OF COMPONENTS 2, 4, 5, 6, 7 AND 8 PRODUCT VAPORS MAY ALSO BE IRRITATING TO THE EYES.

SKIN CONTACT

BASED ON THE PRESENCE OF COMPONENTS 5 AND 7 PRODUCT IS PRESUMED TO BE MODERATELY IRRITATING TO THE SKIN. PROLONGED CONTACT MAY CAUSE DAMAGE TO THIE SKIN. BASED ON THE PRESENCE OF COMPONENTS 1, 2, 4, 5, 6, 7 AND 8 PROLONGED OR REPEATED CONTACT MAY RESULT IN DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN DERMATITIS.

INHALATION

EXPOSURE MAY PRODUCE IRRITATION TO THE NOSE, THROAT, RESPIRATORY TRACT, AND OTHER MUCOUS MEMBRANES. BASED ON THE PRESENCE OF COMPONENTS 1, 2, 4, 5, 6, 7 AND 8 EXPOSURE TO HIGH CONCENTRATIONS OF VAPOR MAY PRODUCE CNS DEPRESSION.

INGESTION

BASED ON THE PRESENCE OF COMPONENT 8 PRODUCT IS PRESUMED TO BE MODERATELY TOXIC. BASED ON THE PRESENCE OF COMPONENT 8 INGESTION MAY CAUSE POSSIBLE KIDNEY DAMAGE. BASED ON THE PRESENCE OF COMPONENTS 5, 6 AND 7 SMALL AMOUNTS OF THE LIQUID ASPIRATED INTO THE LUNGS DURING INGESTION OR FROM VOMITING MAY RESULT IN SEVERE LUNG DAMAGE.

SIGNS AND SYMPTOMS

SYMPTOMS OF EYE IRRITATION INCLUDE PAIN, TEARING, REDDENING AND SWELLING. SYMPTOMS OF SKIN IRRITATION INCLUDE REDDENING, SWELLING, RASH AND REDNESS. SYMPTOMS OF RESPIRATORY IRRITATION INCLUDE RUNNY NOSE, SORE THROAT, COUGHING, CHEST DISCOMFORT, SHORTNESS OF BREATH AND REDUCED LUNG FUNCTION. SYMPTOMS OF GASTROINTESTINAL IRRITATION INCLUDE SORE THROAT, ABDOMINAL PAIN, NAUSEA, VOMITING AND DIARRHEA. BASED ON THE PRESENCE OF COMPONENTS 1, 2, 4, 5, 6, 7 AND 8 CENTRAL NERVOUS SYSTEM DEPRESSION MAY BE EVIDENCED BY HEADACHE, DIZZINESS, NAUSEA AND SYMPTOMS OF INTOXICATION; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR.

AGGRAVATED MEDICAL CONDITIONS

PREEXISTING SKIN, EYE AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LIVER FUNCTIONS FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. BASED ON THE PRESENCE OF COMPONENT 4 PREEXISTING SKIN OR LUNG ALLERGIES MAY INCREASE THE CHANCE OF DEVELOPING INCREASED ALLERGY SYMPTOMS FROM EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS

NONE RECOGNIZED.

SECTION V

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT

IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. SEEK PROMPT MEDICAL ATTENTION.

SKIN CONTACT

IMMEDIATELY REMOVE CONTAMINATED CLOTHING AND SHOES. WIPE EXCESS FROM SKIN AND FLUSH WITH WATER FOR AT LEAST 15 MINUTES USING SOAP AVAILABLE. SEEK PROMPT MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL THOROUGHLY DECONTAMINATED.

INHALATION

REMOVE VICTIM TO FRESH AIR AND TREAT SYMPTOMATICALLY. PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF THE VICTIM IS NOT BREATHING. SEEK PROMPT MEDICAL ATTENTION.

INGESTION

DO NOT INDUCE VOMITING. IF VOMITING SPONTANEOUSLY OCCURS, KEEP THE VICTIM'S HEAD BELOW THE HIPS TO PREVENT ASPIRATION INTO THE LUNGS. SINCE ASPIRATION INTO THE LUNGS CAN CAUSE VERY SERIOUS, PERMANENT DAMAGE, THE DECISION OF WHETHER TO INDUCE VOMITING OR NOT SHOULD BE MADE BY A PHYSICIAN. DANGER FROM LUNG ASPIRATION MUST BE WEIGHED AGAINST TOXICITY WHEN CONSIDERING EMPTYING THE STOMACH. CONSULT A PHYSICIAN, HOSPITAL OR POISON CONTROL CENTER AND/OR TRANSPORT TO AN EMERGENCY FACILITY IMMEDIATELY.

COMPONENTS 4 AND 8 PRODUCT IS PRESUMED TO BE TOXIC AND THE PROPER FIRST AID IS TO INDUCE VOMITING.

>> COMPONENT 6 PRODUCT MAY CAUSE SEVERE, PERMANENT DAMAGE IF ASPIRATED AND VOMITING SHOULD NOT BE INDUCED.

SECTION VI

FIRE AND EXPLOSION HAZARDS

flammability classification - OSHA : FLAMMABLE LIQUID - CLASS IB
 - DOT : FLAMMABLE LIQUID PACKING GROUP III

flash point : -4 F ICC

EXTINGUISHING MEDIA

USE WATER FOG, FOAM, DRY CHEMICAL OR CARBON DIOXIDE.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS

WARNING. EXTREMELY FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL. DO NOT ENTER CONFINED FIRE SPACE WITHOUT HELMET, FACE SHIELD, BUNKER COAT, GLOVES, RUBBER BOOTS, AND A POSITIVE PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS
 CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE. GROUND CONTAINERS WHILE POURING AND LIMIT FREE FALL TO A FEW INCHES TO PREVENT STATIC SPARKS. AVOID SPONTANEOUS COMBUSTION OF CONTAMINATED RAGS AND OTHER EASILY IGNITABLE ORGANIC ACCUMULATIONS (SUCH AS SPRAY BOOTH RESIDUES) BY IMMEDIATE IMMERSION IN WATER.

SECTION VII

REACTIVITY

STABILITY : STABLE

HAZARDOUS POLYMERIZATION : WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID
 BASED ON THE PRESENCE OF COMPONENTS 1, 2, 4, 5, 6, 7 AND 8 AVOID OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS
 CARBON DIOXIDE, CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

SECTION VIII

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
 AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. IF EXPOSURE EXCEEDS TLV USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE.

PROTECTIVE CLOTHING
 AVOID CONTACT WITH EYES. WEAR GOGGLES IF THERE IS A LIKELIHOOD OF CONTACT WITH EYES. DO NOT GET ON SKIN OR ON CLOTHING.

ADDITIONAL PROTECTIVE MEASURES
 USE VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE FOR USE IN AN EMERGENCY.

SECTION IX

ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
 LARGE SPILLS >> EVACUATE THE HAZARD AREA OF UNPROTECTED PERSONNEL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. IF VAPOR CLOUD FORMS, WATER FOG MAY BE USED TO SUPPRESS; CONTAIN RUN-OFF. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTIONS AS ABOVE. SMALL SPILLS >> TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS; SEAL TIGHTLY FOR PROPER DISPOSAL.

WASTE DISPOSAL
 REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

SECTION X

ADDITIONAL PRECAUTIONS

KEEP LIQUID AND VAPOR AWAY FROM HEAT, SPARKS, AND FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER POSSIBLE SOURCES OF IGNITION PRIOR TO USE AND UNTIL VAPORS ARE GONE. SURFACES THAT ARE SUFFICIENTLY HOT MAY IGNITE PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. VAPORS MAY ACCUMULATE AND TRAVEL TO IGNITION SOURCES DISTANT FROM HANDLING SITE.

CONTAINERS CAN CONTAIN HAZARDOUS PRODUCT RESIDUES EVEN WHEN EMPTY. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING, OR USING TOILET FACILITIES. KEEP CONTAINERS CLOSED WHEN NOT IN USE. USE WITH ADEQUATE VENTILLATION. CONTAINER, EVEN IF EMPTY, CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL, GRIND, OR WELD NEAR CONTAINERS.

THE DATA SET FORTH IN THIS SHEET ARE BASED ON INFORMATION PROVIDED BY THE SUPPLIERS OF THE RAW MATERIALS AND CHEMICALS USED IN THE MANUFACTURE OF THE AFFOREMENTIONED PRODUCT. C.E.BRADLEY MAKES NO WARRANTY, EXPRESS OR IMPLIED WITH RESPECT TO THE ACCURACY OF THE INFORMATION PROVIDED BY THEIR SUPPLIERS, AND DISCLAIMS ALL LIABILITY OF RELIANCE THEREOF. C.E.BRADLEY LABORATORIES, INC. WARRANTS ONLY THAT ITS PRODUCTS CONFORM WITH THEIR PUBLISHED SPECIFICATIONS, AND NO OTHER EXPRESS WARRANTY IS MADE WITH REGARD THERETO. WE DO NOT GUARANTEE FAVORABLE RESULTS AND WE ASSUME NO LIABILITY IN CONNECTION WITH THE USE OF THE PRODUCTS. THEY ARE INTENDED FOR USE BY PERSONS HAVING TECHNICAL SKILL AND KNOWLEDGE, AT THEIR OWN DISCRETION AND RISK.

Appendix B

List of Hazardous Air Contaminants

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY I

Hazardous air contaminants known or suspected
to cause carcinogenicity

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard and Stationary Source Hazardous Air Impact Standard</u>	
	<u>Annual Average</u> ($\mu\text{g}/\text{m}^3$) ^a	<u>Action Level</u> (lbs/8 hr)
Acrylamide	0.01	0.00083
Acrylonitrile	0.015	0.0012
Allyl chloride	0.29	0.023
Aniline	0.01	0.00083
Antimony trioxide	0.01	0.00083
Arsenic Compounds	0.00023	0.000019
Arsine	0.01	0.00083
Asbestos, all forms	0.00012	0.00001
Benzene	0.12	0.0096
Benzidine	0.000015	0.0000012
Benzo-a-pyrene	0.00030	
	0.0013	0.00010
Biphenyl	0.01	0.00083
Bromoform	0.01	0.00083
1,3-Butadiene	0.035	0.0028
Cadmium Compounds	0.00057	0.000047
Carbon tetrachloride	0.067	0.0054
Chlorodibenzodioxins/ chlorodibenzofurans	0.02 pg/m^3 ^b	1.6×10^{-9} ^b
Chloroform	0.043	0.0034
Chloroprene	0.01	0.00083
Chromium (VI) Compounds	0.000085	0.0000071 ^c
Diazomethane	0.01	0.00083
Dichloroethyl ether	0.0031	0.00025
Dimethyl sulfate	0.01	0.00083
2,4-Dinitrotoluene	0.011	0.00091
Dioxane	0.01	0.00083
Epichlorohydrin	0.35	0.028
Ethylene dibromide	0.000085	0.0000071
Ethylene dichloride	0.038	0.0030
Ethylene oxide	0.010	0.00083
Formaldehyde	0.08	0.0066
Hexachlorobenzene	0.0021	0.00017
Hexachlorobutadiene	0.045	0.0036

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY I

Hazardous air contaminants known or suspected
to cause carcinogenicity

Hazardous Ambient
Air Standard
and
Stationary Source
Hazardous Air Impact
Standard

<u>Contaminant</u>	<u>Annual Average</u> (ug/m ³) ^a	<u>Action Level</u> (lbs/8 hr)
Hexachloroethane	0.25	0.020
Methyl bromide	0.01	0.00083
Methyl chloride	0.01	0.00083
Methylene chloride	2.0	0.16
Methyl iodide	0.01	0.00083
Nickel carbonyl	0.01	0.00083
Nickel Compounds	0.0033	0.00026
2-Nitropropane	0.01	0.00083
Polychlorinated biphenyls	0.00081	0.000065
Propylene dichloride	0.01	0.00083
Propylene imine	0.01	0.00083
Propylene oxide	0.01	0.00083
1,1,2,2-Tetrachloroethane	0.017	0.0014
Tetrachloroethylene	0.41	0.033
o-Toluidine	0.01	0.00083
1,1,2-Trichloroethane	0.061	0.0049
Trichloroethylene	0.42	0.034
2,4,6-Trichlorophenol	0.18	0.014
Vinyl chloride	0.20	0.016

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY II

Hazardous air contaminants believed to cause chronic systemic toxicity due to long term exposure

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u>	
	<u>Annual Average</u> (ug/m ³) ^a	<u>Action Level</u> (lbs/8 hr)
Barium, total	11.9	1.0
Bisphenol A epichlorohydrin	74	6.1
4-Butyrolactone	12	1.0
Chlorobenzene	833	69.1
Chromium Compounds, except for Cr (VI) Compounds	0.12	0.01
Cumene	583	48.4
Cyclohexene	2,420	201
Dimethoxyethane17	1.4
Dimethylphthalate	120	10.0
Ethanolamine	190	15.8
Fluoranthene	130	11.0
Fluoride Compounds	59.5	4.9
Lead Compounds	0.25 ^d	0.014
Manganese Compounds	119	9.9
Mercury Compounds	0.12	0.01
Mercury, alkyl compounds	0.024	0.0020
2-Methoxyethanol	381	31.6
Molybdenum Compounds	12	1.0
Naphthalene	120	10.0
Octachloronaphthalene	0.24	0.020
Pentachloronaphthalene	1.19	0.10
Pentachlorophenol	1.19	0.10
Phenanthrene	1.30	0.10
Pyrene	3.40	0.28
Pyridine	357	29.6
Selenium, total	4.80	0.40
Silica, amorphous	240	19.9
Silica, crystalline	0.12	0.010
Silica, fused	0.24	0.020
Silicon tetrahydride	16.7	1.4
Silver Compounds	0.24	0.020
Sodium Bromide	1,470	122
Stoddard solvent	12,500	1,040
Styrene monomer	512	42.5
Tellurium Compounds	2.40	0.20
Tetrachloronaphthalene	4.80	0.40
Tin Compounds	4.8	0.4
Trichloronaphthalene	11.9	1.0

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY II

Hazardous air contaminants believed to cause chronic systemic toxicity due to long term exposure

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u>	
	<u>Annual Average</u> (ug/m ³) ^a	<u>Action Level</u> (lbs/8 hr)
Triethylamine	98	8.1
Triethylenetetramine	16	1.3
Trifluorobromomethane	14,525	1,210
Trimethyl benzene	293	24
1,2,4-Trimethyl benzene	0.15	0.013
Xylene	1,040	86.3

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY III

Hazardous air contaminants believed to cause
short-term irritant effects

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u> (ug/m ³) ^a	<u>Averaging Time</u>	<u>Action Level</u> (lbs/8 hr)
Acetaldehyde	1,800	8 hr	75.6
Acetic acid	250	8 hr	10.5
Acetic anhydride	200	8 hr	8.4
Acetone	178,000	8 hr	7,480
Acetonitrile	7,000	8 hr	294
Acrolein	2.5	8 hr	0.11
2-Amino-2-methyl- 1-propanol	65	24 hr	3.4
Ammonia	1,800	8 hr	75.6
Ammonium sulfamate	23.8	24 hr	1.2
n-Amyl acetate	53,000	8 hr	2,230
s-Amyl acetate	66,500	8 hr	2,790
Antimony Compounds	50.0	8 hr	2.1
1,2-Benzenedicarboxylic acid	357	24 hr	19
Benzyl alcohol	10	8 hr	0.42
Bisphenol A resin	210	24 hr	11
Bromodichloromethane	42	24 hr	2.2
2-Butoxyethanol	12,000	8 hr	504
Butoxyethyl acetate	270	8 hr	11
2-(2-Butoxyethoxy)-ethanol	300	24 hr	15.6
n-Butyl acetate	7,100	8 hr	298
s-Butyl acetate	95,000	8 hr	3,990
t-Butyl acetate	95,000	8 hr	3,990
n-Butyl alcohol	360	24 hr	18.7
s-Butyl alcohol	3,050	8 hr	128
t-Butyl alcohol	3,000	8 hr	126
Butylamine	150	8 hr	6.3
Butyl propasol	142	24 hr	7.4
p-t-Butyltoluene	143	24 hr	7.4
1,4-Butyldiol	0.1	24 hr	0.005
Calcium oxide	20.0	8 hr	0.84
Carbon disulfide	714	24 hr	37.1
Chlorine	30.0	8 hr	1.3
Chlorine dioxide	3.0	8 hr	0.13
2-Chloroethyl vinyl ether	1.0	24 hr	0.05
Cobalt Compounds	0.12	24 hr	0.0062
Copper Compounds	100	8 hr	4.2
Cyanide Compounds	500	8 hr	21.0
Cyclohexane	10,500	8 hr	441

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY III

Hazardous air contaminants believed to cause short-term irritant effects

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u> (ug/m ³) ^a	<u>Averaging Time</u>	<u>Action Level</u> (lbs/8 hr)
Cyclohexanol	2,000	8 hr	84.0
Cyclohexanone	240	24 hr	12.5
Cyclohexylamine	95	24 hr	5.0
Decane	1,300	8 hr	54.6
Decarborane	0.71	24 hr	0.037
Diacetone alcohol	565	24 hr	29
Dibenzoyl peroxide	50	8 hr	2.1
Dibromochloromethane	39	24 hr	2.0
Dibutyl phthalate	500	8 hr	21.0
o-Dichlorobenzene	3,000	8 hr	126
Dichlorodifluoromethane	118	24 hr	6.1
1,1-Dichloroethane	19,300	24 hr	1,004
1,2-Dichloroethylene	79,000	8 hr	3,320
s-Dichlorotetrafluoroethane	167,000	24 hr	8,680
Diethanolamine	130	8 hr	5.4
Diethylamine	71.4	24 hr	3.7
Diethylaminoethanol	480	8 hr	20
Diethylene glycol ethyl ether	297	8 hr	12.5
Dimethyl ammonium chloride	49	24 hr	2.5
Dimethoxymethane	7,380	24 hr	384
Dimethylamine	42.9	24 hr	2.2
n,n-Dimethyl dodecylamine	63	24 hr	3.3
Dimethylethanolamine	27	8 hr	1.1
2,6-Dimethyl-4-heptanone	345	24 hr	18
n,n-Dimethyl octadecylamine	5.5	24 hr	0.3
1,3-Dioxolane	92	24 hr	4.8
Diphenylmethane diisocyanate	0.48	24 hr	0.025
Dipropylene glycol	1,680	8 hr	70
Dipropylene glycol methyl ether	6,000	8 hr	252
Dodecylguanidine hydrochloride	0.6	8 hr	0.025
Doxorubicin	115	24 hr	6.0
1,2-Epoxy butane	11	8 hr	0.58
2-Ethoxyethanol	45.2	24 hr	2.4
2-Ethoxyethyl acetate	64.3	24 hr	3.3
Ethyl acetate	140,000	8 hr	5,880
Ethyl alcohol	44,770	24 hr	2,330
Ethylamine	42.9	24 hr	2.2
Ethyl benzene	43,500	8 hr	1,830

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY III

Hazardous air contaminants believed to cause
short-term irritant effects

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u> (ug/m ³) ^a	<u>Averaging Time</u>	<u>Action Level</u> (lbs/8 hr)
Ethyl bromide	8,900	8 hr	374
Ethyl butyl ketone	2,300	8 hr	96.6
Ethylene diamine	60	24 hr	3.1
Ethyl-3-ethoxy propionate	230	24 hr	12
Ethylene glycol	1,270	8 hr	53
Ethyl ether	120,000	8 hr	5,040
2-Ethyl hexanol	130	24 hr	6.9
2-Ethylhexyl ester acrylic acid	29	8 hr	1.2
Ethyl mercaptan	125	8 hr	5.3
Fluorine	200	8 hr	8.4
Formic acid	90.0	8 hr	3.8
Furfural	80.0	8 hr	3.4
Glutaraldehyde	8,200	8 hr	340
Glyoxal	130	24 hr	6.8
Heptane	16,000	8 hr	672
Hexamethylene-1-6-diisocyanate	0.082	24 hr	0.004
n-Hexane	4,290	24 hr	223
Hydrogen chloride	16.7	24 hr	0.87
Hydrogen fluoride	59.5	24 hr	3.1
Hydrogen peroxide	15.0	8 hr	0.63
Hydrogen sulfide	33.3	24 hr	1.7
Hydroquinone	4.8	24 hr	0.2
Iodine	100	8 hr	4.2
Iron Compounds	24	24 hr	1.2
Isoamyl acetate	5,250	8 hr	221
Isoamyl alcohol	3,600	8 hr	151
Isobutyl acetate	7,000	8 hr	294
Isobutyl alcohol	1,500	8 hr	63.0
Isobutyl ester isobutyric acid	580,780	24 hr	30,200
Isophorone	1,400	8 hr	59
Isopropyl acetate	9,500	8 hr	399
Isopropyl alcohol	98,000	8 hr	4,120
Isopropylamine	120	8 hr	5.0
Isopropyl ether	10,500	8 hr	441
Kerosene	51,000	24 hr	2,650
Methoxyethoxyethanol	595	24 hr	31
o-Methoxyphenol	47	24 hr	2.4

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY III

Hazardous air contaminants believed to cause short-term irritant effects

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u> (ug/m ³) ^a	<u>Averaging Time</u>	<u>Action Level</u> (lbs/8 hr)
1-Methoxy-2-propanol	3,600	8 hr	151
Methyl acetate	1,450	24 hr	75.4
Methyl alcohol	6,190	24 hr	322
Methylamine	120	8 hr	5.0
p-Methylaminophenol sulfate	5,100	24 hr	265
Methyl amyl ketone	2,330	8 hr	98
Methylcyclohexanol	560	24 hr	29.1
Methyl ester salicylic acid	180	24 hr	9.4
Methyl ethyl ketone	5,900	8 hr	248
Methyl ethyl ketone peroxide	15.0	8 hr	0.63
Methyl isoamyl ketone	2,400	8 hr	100
Methyl isobutyl ketone	490	24 hr	25
Methyl methacrylate	41,000	8 hr	1,720
3-Methyl-2-oxazolidone	57	8 hr	2.4
1-Methyl-2-pyrrolidone	960	24 hr	49.9
Minerals Spirits	3,210	24 hr	167
Morpholine	700	8 hr	30
Nitric acid	500	8 hr	21.0
Nitric oxide	71.4	24 hr	3.7
Nitrobenzene	119	24 hr	6.2
p-Nitrochlorobenzene	71.4	24 hr	3.7
Nitroethane	738	24 hr	38.4
Nitromethane	2,500	8 hr	105
1-Nitropropane	900	8 hr	37.8
1-Nitrotoluene	262	24 hr	13.6
Oxalic acid	100	8 hr	4.2
1-Pentanol	120	24 hr	6.1
2-Pentanone	1,680	24 hr	87
Perchloric acid	50	24 hr	2.6
Phenol	1,900	8 hr	78.9
Phenoxyethanol	81	24 hr	4.2
Phenyl ether	700	8 hr	29.4
1-Phenyl-3-pyrazolidone	13	24 hr	0.67
Phosgene	40.0	8 hr	1.7
Phosphine	40.0	8 hr	1.7
Phosphoric acid	100	8 hr	4.2
Phosphorus pentachloride	10.0	8 hr	0.42
Phosphorus pentasulfide	10.0	8 hr	0.42

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY III

Hazardous air contaminants believed to cause
short-term irritant effects

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u> (ug/m ³) ^a	<u>Averaging Time</u>	<u>Action Level</u> (lbs/8 hr)
Phosphorus trichloride . . .	15.0	8 hr	0.63
Phthalic anhydride	600	8 hr	25.2
Picric acid	0.24	24 hr	0.012
Platinum Compounds	0.005	24 hr	0.0003
Potassium hydroxide	20.0	8 hr	0.84
1,2-Propanediol	1,300	24 hr	67
2-Propoxyethanol	4.3	8 hr	0.18
Propoxypropanol	210	24 hr	11
n-Propyl acetate	8,350	24 hr	350
n-Propyl alcohol	50,000	8 hr	2,100
1,2-Propylene carbonate . . .	1,260	8 hr	53
Sebacic Acid	268	8 hr	11
Sodium hydroxide	20.0	8 hr	0.84
Sodium tripolyphosphate . . .	84	24 hr	4.4
Sulfuric acid	23.8	24 hr	1.2
Sulfur monochloride	600	8 hr	25.2
1,1,2,2-Tetrachloro- 1,2-difluoroethane	9,930	24 hr	516
Tetrahydrofuran	14,050	24 hr	731
Texanol	207	24 hr	11
Titanium dioxide	240	24 hr	12
Toluene	8,930	24 hr	464
Toluene-2,4-diisocyanate . . .	0.10	24 hr	0.0052
p-Toluenesulfonic acid	113	24 hr	5.9
1,1,1-Trichloroethane	190,000	8 hr	7,980
Trichlorofluoromethane	133,500	24 hr	6,940
1,2,3-Trichloropropane	14.3	24 hr	0.74
1,1,2-Trichloro- 1,2,2-trifluoroethane	181,000	24 hr	9,410
2,4,6-Tri(dimethyl animomethyl) phenol	78	24 hr	4.0
Triethanolamine	400	24 hr	20
Triethyl ester phosphoric acid	970	24 hr	80
Triethyl orthoformate	190	24 hr	9.8
s,s,s-Trimethyl ester phosphorotrithioic acid	78	24 hr	4.1
Triorthocresyl phosphate	0.24	24 hr	0.012
Turpentine	1,300	24 hr	69

HAZARDOUS AMBIENT AIR STANDARDS

CATEGORY III

Hazardous air contaminants believed to cause short-term irritant effects

<u>Contaminant</u>	<u>Hazardous Ambient Air Standard</u> (ug/m ³) ^a	<u>Averaging Time</u>	<u>Action Level</u> (lbs/8 hr)
4-Undecanol, 7-ethyl-2-methyl-hydrogen sulfate	13	24 hr	0.67
Vanadium Compounds	1.2	24 hr	0.06
Vinyl acetate	350	8 hr	14.7
Vinyl toluene	5,710	24 hr	297
VM & P naphtha	3,210	24 hr	167
Zinc chloride	2.4	24 hr	0.12
Zinc Compounds	12.0	24 hr	0.62

- *****
- a - All HAAS concentrations in ug/m³ unless otherwise noted.
 - b - Expressed as 2,3,7,8-Tetrachlorodibenzo-p-dioxin equivalents.
 - c - The hexavalent chromium *emissions* from municipal waste *incinerators* shall be set at 10% of the total chromium concentration as measured in the exhaust gases from municipal waste *incinerators*.
 - d - Lead HAAS expressed as a three (3) month average.

Appendix C: Hazardous Air Contaminant (HAC) Calculations

How to Determine Your Hazardous Air Contaminant (HAC) Use

- ① The first step is to **gather your Material Safety Data Sheets (MSDS)** for all coating, gluing, washoff and cleaning materials used at your facility. The MSDS for a solventborne *Compliant Sealer* is attached at the end of Appendix A and should be referenced throughout this section. You may want to refer to the "A Quick Guide to Reading a Material Data Safety Sheet" also at the end of Appendix A for a brief overview of what type of information is contained in each section of an MSDS.
- ② Review each MSDS to **determine whether any hazardous air contaminants (HACs)** are in any of the materials you use (the list of HACs is incorporated in Vermont's Air Pollution Control Regulations is contained in Appendix B. Make a list of all of the different HACs present in all of the materials you use. You may want to fill out a table similar to the one included in this appendix to help you keep track of the information. For example, the *Compliant Sealer* contains 6 different HACs: acetone, ethyl benzene, isopropyl alcohol, n-butyl acetate, toluene and xylene. You need to complete this step for *each* material you use.
- ③ **Determine the total number of gallons** of each material you use in an 8 hour day. For example, let's say you use 8 gallons per day of the *Compliant Sealer*. If you don't have daily coating use records, you can use monthly or yearly records and divide by the number of days you use that coating on the finishing line. You need to repeat this step for *each* material you use.
- ④ Choose a HAC from the list developed in Step 2 and gather all the MSDSs for materials that contain that compound. Then look at Section 2 or 3 of each of the MSDSs to find the **percentage of the chosen HAC (by weight) and coating density** (total weight of one gallon)¹ for each of your materials. For example, if we chose xylene, then for the *Compliant Sealer*, the HAC percentage by weight is found on page 1 in Section II-A: xylene is 11.93% by weight. The coating density is found on page 2 in Section III and is 8 pounds per gallon. You need to repeat this step for *each* material you use.

¹

Note: Sometimes the coating supplier lists specific gravity instead of coating density. You calculate the coating density in pounds per gallon by multiplying the specific gravity by 8.34 (the weight of a pound of water). If the specific gravity listed on the MSDS uses a reference other than water, you need to use the density of that reference compound. Unless specified otherwise, you should assume that the specific gravity reference is water.

Example: if Specific Gravity = 0.96
then the coating density = 0.96×8.34 pounds/gallon = 8 pounds/gallon

- ⑤ For the HAC you chose in Step 4, xylene for example, **determine the emissions of that HAC from each coating** in an 8 hour workday using the following formula:

$$\text{Formula: HAC} = \text{Gallons}_{(\text{Daily})} \times \text{Density} \times (\% \text{HAC}/100)$$

Where:

HAC = The HAC emissions from the material (in pounds/8 hours)
Gallons_(Daily) = The number of gallons used in an 8 hour day.
Density = The density (total weight) of the material in pounds per gallon.
%HAC = The percentage (by weight) of the HAC contained in the material.

Compliant Sealer Example for xylene:

$$\text{HAC} = 8 \text{ gallons per day} \times 8 \text{ pounds per gallon} \times (11.93/100) = 7.64 \text{ pounds of xylene per 8 hours from the Compliant Sealer}$$

You need to repeat this calculation for *each* material you use that contains the HAC chosen in Step 4.

- ⑥ For the HAC chosen in Step 4, you need to add up all of the individual 8 hour calculations you developed in Step 5 (you should have a calculation for each material that contains the chosen HAC, xylene for example). Then **compare that total to the 8 hour Action Level** listed in the regulations.² For example, the current Action Level for xylene is 86.3 pounds per 8 hour day.
- ⑦ Then you need to choose another HAC from the list you developed in Step 2 and begin the process again at Step 4. You must repeat this process (Steps 4, 5 and 6) until you have evaluated **each of the different HACs** you use at your facility.

NOTE: If you exceed the 8 hour Action Level for even one HAC, you should contact the DEC Air Pollution Control Division (802-241-3840) to determine your obligations.

²

The Air Pollution Control Division (APCD) intends to amend the current regulation. Therefore, the "Action Level" shown in Appendix B might no longer be correct. You should contact the APCD at (802) 241-3840 to obtain the current "Action Level" for the HACs used at your facility.

Example Table for HAC Calculation Information

HAC name	List of materials containing that HAC	Number of gallons used in 8 hours	Weight of material (lbs./gallon)	% HAC (by weight)	Pounds of HAC used in 8 hours	Action Level (lbs. / 8 hrs.)
Example: xylene	<i>Compliant Sealer</i>	8	8	11.93	7.64	
	Another coating					
	Another coating					
Total for xylene						86.3

Where: Pounds HAC in 8 hours = (gallons material used in 8 hours) X (weight of material) X (%HAC/100)
 = Column 3 x Column 4 x (Column 5÷100)

Appendix D

Hazardous Waste Notification Form and Instructions

Vermont Waste Management Division
103 South Main Street/West Office Building
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX: (802) 241-3296

INSTRUCTIONS FOR COMPLETING THE VERMONT NOTIFICATION OF REGULATED WASTE ACTIVITY FORM

Background: The Vermont Hazardous Waste Management Regulations (VHWMR) requires anyone "who generates or who is in control of a waste" in Vermont to determine if that waste is a hazardous waste; the only exception is waste produced by household activities. A hazardous waste is any waste which is listed as such in the VHWMR or that is ignitable, corrosive, reactive, or toxic. These broad categories include many of the wastes commonly produced by businesses and municipalities. Everyone who manages hazardous waste (e.g., who creates, stores, transports, treats, recycles, or disposes of it) is a "handler" of that waste and is required to submit a notification form.

Notification Requirement:

- ✓ Section 7-104 of the VHWMR requires that "Any person who generates or transports hazardous waste or who owns or operates a . . . facility for the treatment, storage, use, disposal, or recycling of hazardous waste shall notify the Secretary of such activity" (this includes the generation, marketing, burning, and/or transportation of waste oil, as well as some universal waste management activities).
- ✓ Hazardous waste handlers are required to maintain an up-to-date notification form with this Division which accurately describes current waste activity, waste generation at the facility location, and ownership of the hazardous waste handler. **There is no fee for notifying.** Notification forms should be submitted prior to conducting any regulated waste activity.
- ✓ Submittal of a notification form results in a permanent, unique U.S. Environmental Protection Agency (EPA) ID number being issued to that hazardous waste handler's site of operations.
- ✓ If a company handles hazardous waste at more than one location, a separate notification and EPA identification number is needed for each (unless they are on adjacent parcels of land with the same land owner).
- ✓ If a facility no longer handles hazardous waste at a location that has been issued an EPA ID number, the Vermont Waste Management Division should be notified in writing. A letter should be submitted that includes the handler's name, address, EPA ID number, and a brief explanation of the change in waste handling activities.
- ✓ Notification is required upon transferral of ownership of an entity that was required to notify previously for a hazardous waste activity. Since EPA ID numbers are assigned to waste handler locations, the U.S. EPA ID number will not change if ownership of a facility changes.

Hazardous, universal, and used oil waste managed in the course of doing business, including at municipalities, is regulated by the VHWMR. Although household hazardous waste is exempted per Section 7-203(a), hazardous waste generated by a business run out of a home is regulated.

GENERALLY, THE LESS HAZARDOUS WASTE GENERATED, THE FEWER REGULATIONS APPLY. THE VERMONT ENVIRONMENTAL ASSISTANCE DIVISION IS AVAILABLE TO PROVIDE FREE ASSISTANCE IN REDUCING THE AMOUNT OR TOXICITY OF HAZARDOUS WASTE PRODUCED. IN VERMONT, YOU MAY CONTACT THAT NON-REGULATORY OFFICE BY CALLING 1-800-974-9559.

Instructions: Pursuant to Section 7-104 of the VHWMR, the attached two-sided Notification of Regulated Waste Activity form must be completed by all hazardous waste handlers in Vermont and submitted to the Vermont Waste Management Division. Please type or print clearly in dark ink, not pencil. If additional sheets are needed, please mark each appended sheet with the information required by lines 2 and 3; each additional sheet should also be signed by an authorized representative and dated, in accordance with line 12. The following instructions complement the limited instructions that have been included on the notification form:

- Line 1: Mark "**first notification**" if the handler location either does not have an identification number or if a 12-digit number beginning with the letters "VTP" (used to denote a provisional, or temporary, number) had been issued in the past. The "**subsequent notification**" section must be completed if the facility has already been assigned a permanent ID number and there have been changes to the facility address, the installation contact person, facility ownership, or the type or quantity of regulated waste activity. If the facility ownership has changed, or if an owner has been added, also please include the date of this change on the "reason for change" line. *NOTE: the entire form must be completed when submitting a subsequent notification.*
- Line 5: Indicate a person who is responsible for regulated waste activities at the facility location. Generally, this should not be a consultant or your facility's hazardous waste contractor.
- Line 7: Choose the best description of who owns the land for the property being notified about. For incorporated companies, mark "**private**" even if shares are publicly traded on a stock exchange.
- Line 9a: Section 7-305 of the VHWMR specifies that "a generator is any person, by site, whose act or process produces hazardous waste or whose act first causes hazardous waste to become subject to regulation." A waste is considered to be generated when it is put into a container for disposal or when a determination has otherwise been made that a material is a waste; all waste needs to be evaluated to determine whether it is hazardous or not. A Hazardous Waste Generator Status Comparison Table, comparing the differences between the three categories of hazardous waste generators — Conditionally Exempt (CEGs), Small Quantity (SQGs), and Large Quantity (LQGs) — is attached to this informational package. Hazardous waste managed in the course of doing business — including at municipalities and at home-based businesses — is regulated by the VHWMR.
- It is important that you figure out your generator status by tracking the amount of hazardous waste **generated** per month; status is not based on how much hazardous waste is **shipped** in that month. Note that materials that are generated, reclaimed, and reused at the facility location only need to be counted once.
- Line 9b: *Do not complete this section if your company plans to hire another company to transport the wastes from your generation location. If your facility wishes to be a hazardous waste transporter, this activity requires a permit — contact the Waste Management Division at 241-3888 for more information.* Mark "**of own waste only**" if you wish to transport hazardous waste and you do not meet the provision that allows conditionally exempt generators to transport their own hazardous waste to an authorized facility or event.
- Mark "**for commercial purposes**" only if you are requesting a permit to transport other peoples' hazardous waste.
- Line 9c: Mark "**hazardous waste transfer facility**" only if your facility wishes to be a permitted hazardous waste transporter that manages hazardous waste for up to ten days on a transfer basis.

Mark “**certified treatment, storage or disposal facility**” only if your facility plans to engage in any of the following activities:

- ✓ conduct on-site hazardous waste treatment or disposal activities, or
- ✓ accept hazardous waste from off-site for treatment, storage, or disposal — unless your company accepts hazardous waste from a CEG in Vermont that is owned and operated by the same entity as your company and generator standards are met for the waste storage activities; or,
- ✓ store hazardous waste for longer than the VHWMR allows generators to store hazardous waste. Allowable time limits for hazardous waste storage are as follows:
 - CEGs: no time limit provided that no more than 2,200 pounds of hazardous waste, 2.2 pounds (1 kilogram) of acutely hazardous waste, or 220 pounds of any residue or contaminated soil, waste or debris resulting from clean-up of a spill of acutely hazardous waste are accumulated at any one time
 - SQGs: full containers — or those with >55 gallons — of hazardous waste, may be stored for up to 180 days without requiring certification to store hazardous waste
 - LOGs: full containers — or those with >55 gallons — of hazardous waste, may be stored for up to 90 days without requiring certification to store hazardous waste

Mark “**hazardous waste fuel burner**” only if hazardous waste or a mixture thereof is burned on-site. Note that the burning of used oil does not make an entity a “hazardous waste fuel burner.” Report used oil activity in Section 10 of the notification form.

Line 9d: In order to complete this section, evaluate all material that is discarded from the waste handler location to determine if it is hazardous waste — including manufacturing by-products and off-specification, out-dated, or otherwise unusable products. Waste determination may be based on general knowledge of the materials and processes, information provided on Material Safety Data Sheets, or it may be necessary to perform laboratory analysis on the waste. Frequently, business associations, chemical suppliers, or product manufacturers can assist in making a waste determination; however, if you request assistance from these sources, they may not be aware that Vermont regulates certain wastes as hazardous that are not regulated as hazardous wastes either Federally or in other states (e.g., “Waste containing greater than 5% by weight of petroleum distillates with melting points of less than 100°F” is a VT02 hazardous waste). There are seven categories of hazardous wastes:

- »» characteristic wastes (defined by waste codes D001 through D043);
- »» listed wastes from non-specific sources (waste codes F001 - F039);
- »» listed wastes from specific sources (waste codes K001 - K151);
- »» commercial chemical products, intermediates, or off-specification products:
 - »» acutely-hazardous wastes have waste codes P001 - P123;
 - »» non-acute wastes have waste codes U001 - U359; and
- »» Vermont-listed wastes (waste codes VT01 - VT99).

Refer first to the attached list of Frequently-Used State and Federal Hazardous Waste Codes; this includes some of the more common Federal hazardous wastes (with their codes) as well as the seven Vermont listed hazardous wastes. A complete listing of the Federal codes, with detailed definitions, may be found in the VHWMR.

Line 10: “**Specification used oil**” means that the oil has not been mixed with any hazardous waste (except for ignitable waste), does not exceed any maximum allowable levels of contaminants, and meets the minimum allowable levels listed in the following table.

Constituent/Property	Allowable Level (parts per million, or ppm, dry weight basis)
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Chlorine	500 ppm maximum
Lead	100 ppm maximum
Flash Point	140° Fahrenheit minimum
Total Halogens	1000 ppm maximum
Polychlorinated biphenyls (PCBs)	< 2 ppm maximum
Net Heat of Combustion	8000 BTU/lb minimum

Line 10d: The VHWMR § 7-802 defines “**marketer**” as follows: “any person, with the exception of do-it-yourselfers, who . . . (a) Directs a shipment of used oil fuel from their facility to a used oil burner; or (b) First claims that used oil that is to be burned for energy recovery meets the used oil fuel specifications set forth in Table 1 of Section 7-812(c).” This means that anyone who gives, sells, or otherwise provides used oil to someone else to be used for fuel blending or burning is considered to be a marketer. *Note that giving or selling used oil to an entity that re-refines the oil is not included in this “marketer” designation.*

Line 10g: Mark “**space heater**” if used oil is burned in a heater designed to have a maximum capacity of not more than 0.5 million BTUs per hour and combustion gases are vented to the outside ambient air

Mark “**utility boiler**” if used oil is burned in a device used to produce electric power, steam, or heated or cooled air (or other gases or fluids) for sale.

Line 11: Mark “**large quantity handler**” if your facility accumulates a total of 5,000 kilograms (11,000 pounds) or more of universal waste(s) (pesticides, thermostats, polychlorinated biphenyl- (PCB-) containing ballasts, or mercury-containing lamps, calculated collectively) at any time. This designation as a large quantity handler is retained through the end of the calendar year in which a total of 5,000 kilograms or more of universal waste is accumulated.

Mark “**destination facility**” if your facility treats, disposes of, or recycles a particular category of universal waste. A facility at which a particular category of universal waste is only accumulated is not a destination facility for purposes of managing that category of universal waste.

For additional assistance in completing this notification form, if you are unsure whether the waste you handle is hazardous, or for more information regarding the Hazardous Waste Management Regulations, please contact the Vermont Hazardous Waste Management Program at (802) 241-3888 or visit our website at <http://www.anr.state.vt.us/dec/waste.htm>.

The Vermont Environmental Assistance Division is available to provide free assistance in reducing the amount or toxicity of hazardous waste produced. In Vermont, you may contact that non-regulatory office by calling 1-800-974-9559.

VERMONT NOTIFICATION OF REGULATED WASTE ACTIVITY FORM

For Hazardous Waste, Universal Waste, and Used Oil Handlers

1. First Notification (Provisional ID N^o, if applicable: VTP-_____-_____-_____))
 Subsequent Notification (EPA ID N^o: VT_____-_____-_____) (please also complete entire form)

Reason(s) for change (e.g., name change, change of ownership, waste streams, regulatory status):

2. Company Name (as will appear on manifests): _____

3. Location Address (e.g., 22 Main St — not P.O. Box or rural route N^o):

City/Town: _____ County: _____ Zip Code: _____

4. Mailing Address (if different from 3, above): _____

City/Town: _____ State: _____ Zip Code: _____

5. Company Contact Person: (Last Name) _____ (First Name) _____

Job Title: _____ Phone N^o: (_____) _____

6. Name of Legal Property Owner(s): _____

Address: _____

State: _____ Zip Code: _____ Phone N^o: (_____) _____

7. Legal land status: Private (individual(s)/corp(s)) Federal State County Municipal Indian District

Legal facility-owner status: Private Federal State County Municipal Indian District

8. Does your company own other facilities or have affiliates in Vermont? Yes No

If yes, please list name(s) & location(s): _____

9. Hazardous Waste Activity (does not include either "used oil" or "universal waste" activities):

a. Generator Status (consider the total amount of hazardous waste generated per month — not the amount shipped):

Conditionally Exempt Generator (< 220 pounds/month of hazardous waste and < 2.2 lbs/mo of acutely hazardous waste generated)

Small Quantity Generator (220 to 2,200 pounds/month of hazardous waste and < 2.2 lbs/mo of acutely hazardous waste generated)

Large Quantity Generator (> 2,200 pounds/month of hazardous waste or ≥ 2.2 lbs/mo of acute hazardous waste generated)

(NOTE: 220 pounds = 100 kilograms; 220 pounds of waste with a density similar to water fills = ½ of a 55-gallon drum)

b. Transporter (see instructions before marking this section): of own waste only for commercial purposes

Mode of transportation: air rail highway water other: _____

c. Other Activities (please see instructions before marking this section): hazardous waste transfer facility

on-site recycling (e.g., solvent distillation; not antifreeze or silver recovery) certified treatment, storage or disposal

off-site recycling hazardous waste fuel burner (Note: on-specification used oil is not hazardous waste fuel)

Please give details here: _____

Type or print clearly in dark ink. If additional sheets are needed, please mark each appended sheet with the information required by lines 2 and 3; each additional sheet should also be signed by an authorized representative and dated, per line 13. Refer to instructions; for further assistance in completing this form, contact the Hazardous Waste Program at 802-241-3888.

d. Description of Wastes Generated or Handled:

Regulated Waste Description	EPA/State Waste Code(s)*	Amount Generated On-site (in gallons or pounds/month)

* see instructions and attached sheets for frequently-used waste codes; for additional assistance, call 802-241-3888

10. Used Oil Activity (please mark all that apply):

- a. Generator who directs used oil to a used oil fuel burner (burner(s) name/address: _____)
- b. Person who first claims that used oil fuel meets specifications _____
- c. Person who directs shipment of used oil to a re-refinery
- d. Used Oil Fuel Marketer: specification used oil off-specification used oil
 - Marketer who directs shipment of used oil directly to a used oil fuel burner
 - Marketer who directs shipment of used oil to other marketers
- e. Used Oil Collection Facility
- f. Used Oil Transporter
- g. Used Oil Fuel Burner: specification used oil off-specification used oil

Type of equipment used: space heater (rated @ <0.5 million BTU/hr) utility boiler industrial boiler (rated @ >10 million BTU/hr at manufacturing facility) industrial furnace (integral component of manufacturing process)

other (please specify) _____

Is used oil fuel accepted from an off-site locations to be burned on-site? Yes No

If yes, please list the company/ies and address(es) from which used oil is accepted: _____

11. Universal Waste Activity: (e.g., batteries, Hg-lamps, PCB ballasts, pesticides) large quantity handler destination facility

Type(s) of universal waste handled: _____

12. Comments: _____

13. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of authorized representative: _____ Date: _____

Name: _____ Title: _____

For assistance in completing this form, contact the Hazardous Waste Program at 802-241-3888

Please return completed form to: Waste Management Division; 103 South Main St, West Building; Waterbury VT 05671-0404

Appendix E

Hazardous Waste Manifest Information

The Hazardous Waste Manifest

A manifest is a multiple copy shipping form that is used to track the movement of a hazardous waste from the place of its generation to the place of its final disposal. If the final resting place in this "cradle to grave" system is a hazardous waste landfill, some wastes will need to be accompanied by a second form to certify they meet certain pre-disposal treatment standards. This form is called the Land Disposal Restriction (LDR) Notification. Every shipment of hazardous waste must be accompanied by at least a Uniform Hazardous Waste Manifest and possibly by an LDR form.

In most cases, your hazardous waste transporter will help you get your wastes pre-approved for disposal and will provide you with completely filled out manifests and, if necessary, LDR forms. The Waste Management Division (WMD) can provide a list of certified transporters. Contact the WMD at 802-241-3888.

Although you may only have to sign the manifest, you are still responsible for all of the information on it. It is a good idea to check the form to make sure the information is correct and complete. Instructions on how to complete the form are usually printed on the back. After the transporter has accepted your waste he will sign the form and then give you several copies. Make sure you get the right copies. The copies are numbered and have printed on them where they are to be sent.

The following sample manifest is for a hypothetical wood furniture finisher in Vermont using a New Jersey hazardous waste transporter to send its waste to a facility in Ohio. Many states require hazardous wastes being shipped into their state to be reported on their state's manifest form. Nevertheless, the US EPA requires all states to use the same basic form. LDR notifications vary by transporter.



**VERMONT AGENCY OF NATURAL RESOURCES
HAZARDOUS MATERIALS MANAGEMENT**

103 South Main Street
Waterbury, Vermont 05671-0404
802-241-3866

Please type (or Print) (Form designed for use on elite (12-pitch) typewriter.)

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. V T D 0 1 2 3 4 5 6 7 8		Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law, but may be required by State law.		
3. Generator's Name and Mailing Address (where returned manifests are managed) Woodworkers, Inc. 454 East Village Road					A. State Manifest Document Number VT 0110763			
4. Generator's Phone (802) 123-4567					B. Generation Site (if different) SAME			
5. Transporter 1 Company Name On The Road Transport, Inc.		6. US EPA ID Number N J D 0 1 2 3 4 5 6 7 8		C. Trans. 1 Lic. St. NJ Plate # HOD-123				
7. Transporter 2 Company Name		8. US EPA ID Number		D. Trans. 1 Phone (973) 123-4567				
9. Designated Facility Name and Site Address All Gone, Inc. 21 Roadway's End Cleveland, Ohio 87654					E. Trans. 2 Lic. St.		Plate #	
10. US EPA ID Number O H D 0 1 2 3 4 5 6 7 8					F. Trans. 2 Phone ()			
					G. State Facility's ID (not Required)			
					H. Facility's Phone (216) 123-4567			
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)					12. Containers No.	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. Non-Regulated Material, PER 40 CFR, 49 CFR (State Regulated Waste)					0 0 1	D.M	0 0 0 5 5	G EPA STATE VT02
b. RQ Waste Flammable Liquid, N.O.S. 3 UN1993 PGIII (Toluene & Xylene)					0 0 2	D.M	0 0 1 1 0	G EPA D001, F003, F005 STATE
c. Petroleum Naphtha 3 UN1255 PGII (Combustible Liquid)					0 0 1	D.M	0 0 0 5 5	G EPA D001 STATE
d.								EPA STATE
J. Additional Descriptions for Materials Listed Above				K. Handling Codes for Wastes Listed Above				
a. Oil Soaked Sorbents		c. Petroleum Naphtha Solvent						
b. Stain, Thinner		d.						
15. Special Handling Instructions and Information					Point of Departure or Entry - City, State			
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations, and all applicable State law and regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity operator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.								
Printed/Typed Name				Signature		Month Day Year		
17. Transporter 1 Acknowledgement of Receipt of Materials								
Printed/Typed Name				Signature		Month Day Year		
18. Transporter 2 Acknowledgement of Receipt of Materials								
Printed/Typed Name				Signature		Month Day Year		
19. Discrepancy Indication Space								
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted on Item 19.								
Printed/Typed Name				Signature		Month Day Year		

GENERATOR

TRANSPORTER

FACILITY

09/11/96

Appendix F

Information and Assistance Resources

Department of Environmental Conservation (DEC)

Air Pollution Control

Engineering Services Section (Permits) 241-3840

Environmental Assistance Division

Toll-free Hotline 1-800-974-9559

Waste Prevention/Pollution Prevention Program 241-3629

Small Business Compliance Assistance Program 241-3745

Permit Specialists

Barre 476-0195

Essex Junction 879-5676

North Springfield 885-8850

Rutland 786-5907

St. Johnsbury 751-0127

Waste Management Division

Hazardous Waste Program 241-3888

Solid Waste Program 241-3444

Recycling Hotline 1-800-932-7100

Underground Storage Tank Program 241-3888

Wastewater Management Division

Regional Offices

Barre 476-0190

Essex Junction 879-5656

North Springfield 885-8855

Rutland 786-5900

St. Johnsbury 751-0130

Waterbury Central Office

Underground Injection Control Program 241-4455

Pretreatment Discharge Program 241-3822

Business Assistance

Small Business Development Center 1-800-464-SBDC

Vermont Manufacturing Extension Center 728-1421

Trade Association

Vermont Wood Manufacturers Association
Executive Director 287-4284

Reuse and Recycling Options

Surplus & Scrap Wood Products Exchange

Aims to facilitate market linkages between companies by providing both "Wood Wanted" and "Wood Available" listings in a Directory and on the Internet : www.woodexchange.com

contact : Vermont Dept of Forests, Parks and Rec.
or Geosoft : The Company Ltd.

241-3678
(603) 756-4245

Vermont Business Materials Exchange

1 (800) 895-1930

Internet : www.enviro-source.com

Vermont Department of
Environmental Conservation
Environmental Assistance Division
103 South Main Street
Waterbury, VT 05671-0411
800-974-9559

Vermont Small Business
Development Center
P.O. Box 422
Randolph, VT 05060
800-464-SBDC

The Northeast Waste Management
Officials' Association
129 Portland Street
6th Floor
Boston, MA 02114
617-367-8558



<http://www.state.vt.us>

Printed with Vegetable Oil Based
Inks on Recycled Paper
(minimum 20% post-consumer)