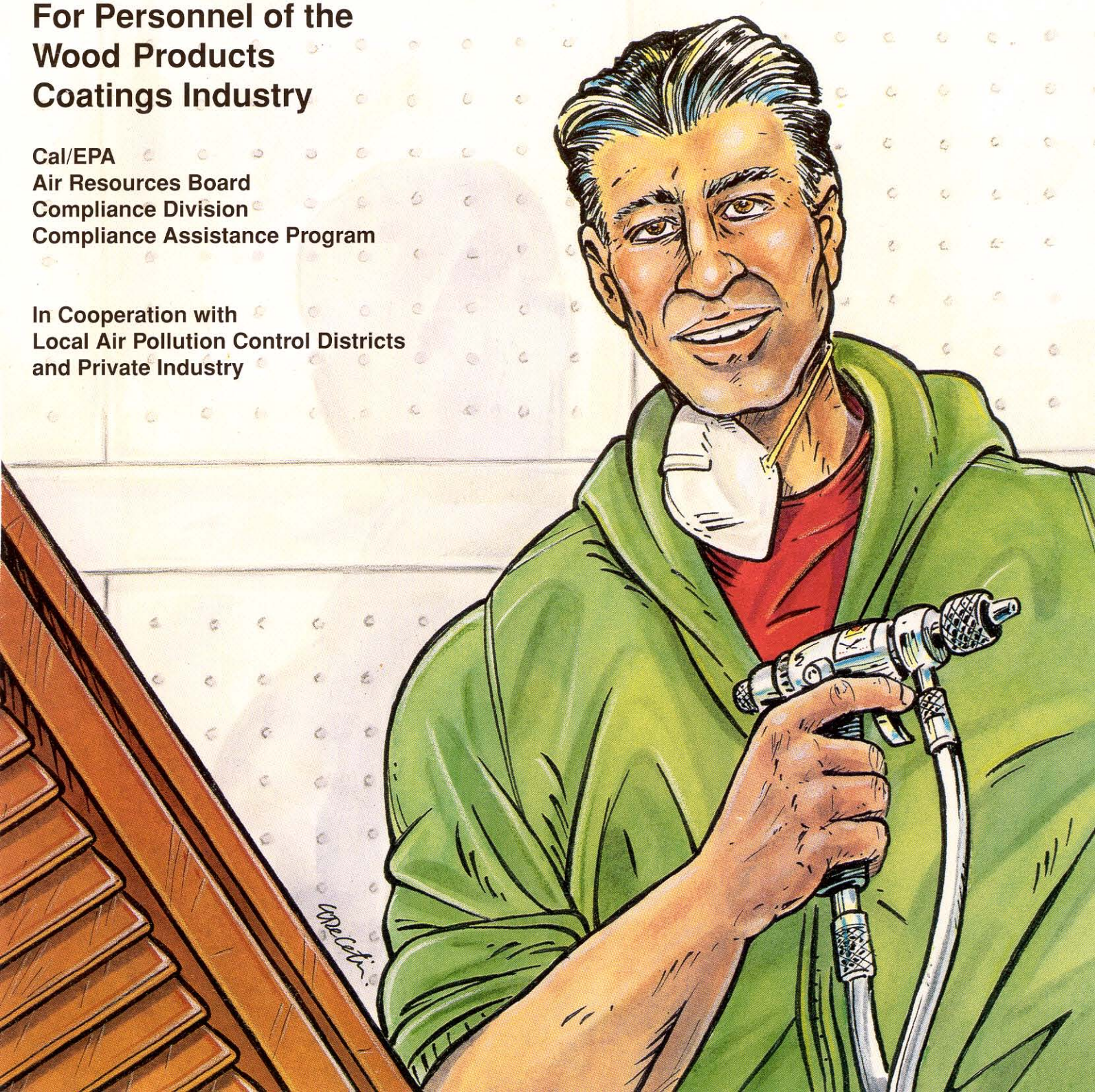
Wood Products Coatings

Self-Inspection Handbook

For Personnel of the Wood Products Coatings Industry

Cal/EPA
Air Resources Board
Compliance Division
Compliance Assistance Program

In Cooperation with
Local Air Pollution Control Districts
and Private Industry



Compliance Assistance

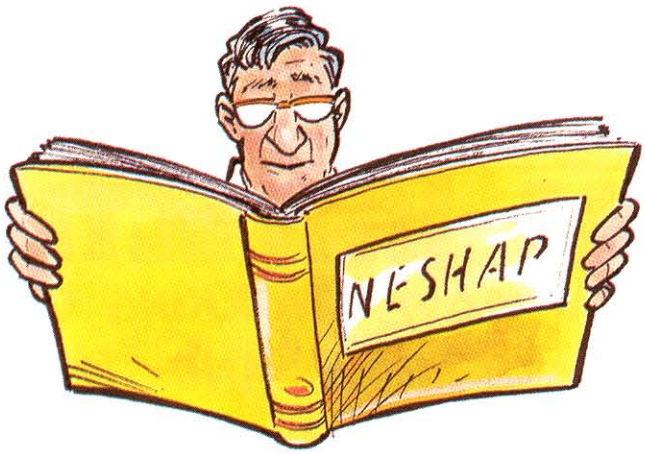
This handbook is designed to help you understand the air pollution control laws dealing with the wood products coatings industry and its operations. A wood products coatings operation consists of a stationary source that performs a combination of coating application steps which may include the use of spray guns, hand application methods, flash-off areas, spray booths, ovens, conveyors, touch-up areas, and/or other equipment operated for the purpose of applying coatings to wood products.

This handbook deals primarily with VOC emissions from general wood product coating operations. When wood furniture is manufactured, the National Emission Standards for Hazardous Air Pollutants (NESHAP) for wood furniture may apply. Additional, detailed information about this NESHAP rule is contained in the Wood Furniture Manufacturing Operations section of the Air Resources Board's (ARBs) Toxics Enforcement Manual.

The handbook will illustrate how to comply with the air pollution control laws by using self-inspections. Read on and see how you can comply with the law, avoid penalties, improve your working conditions, keep your customers and neighbors satisfied, and have a healthy working environment.
Self-inspections can even help you save money!

About NESHAP...

In addition to the VOC rules, if your facility manufactures wood furniture, you may also be subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for wood furniture. If your facility is subject to the NESHAP, work practices and emission standards must be adhered to, and your company must make a plan to implement those work practices.



* **Does your facility manufacture wood furniture?**

If yes, keep records for **five** years even if your facility is small and the additional NESHAP provisions do not apply.

* **Does your facility use less than 250 gallons per month (3,000 gallons all year) of coatings, glues, cleaning, and washoff materials?**

If yes, you are a **non-major** (area) source and subject to recordkeeping rules.

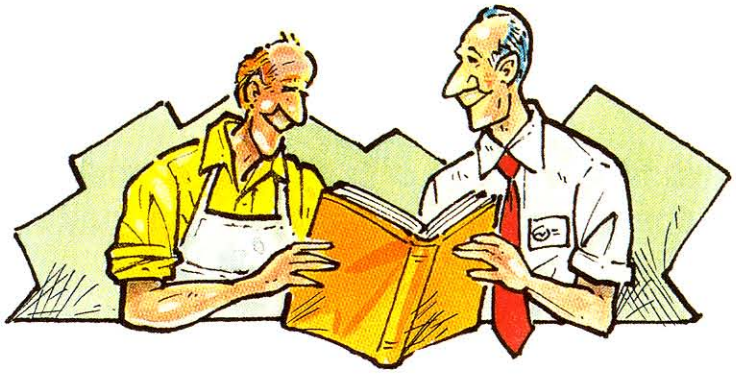
* **Does your facility emit or have the potential to emit more than 10 tons per year of any hazardous air pollutant (or 25 tons per year of all hazardous air pollutants combined)?**

If yes, you are a **major** source and are subject to the NESHAP requirements and a Federal Title V permit is required. Contact your local air quality district for EPA permitting information.

Reducing the use of finishes containing VOC and hazardous compounds may reduce the regulations your facility is subject to.

District Inspections Help You

At regular intervals, an inspector from the local air pollution control district will conduct a complete inspection of your facility. Your wood products coatings facility will be examined to see that you are in compliance with the local regulations.



How Do I Comply and Avoid Penalties?

* Understand VOCs (Volatile Organic Compounds) and HAPs (Hazardous Air Pollutants)
* Know Your Permit Limits
* Use Compliant Materials
* Maintain Your Equipment
* Store Materials Properly
* Practice Proper Waste Storage and Disposal
* Train Your Employees
* Keep Accurate Records
* Know all the Local Rules Pertaining to your Operations

VOCs Produce Ozone

Organic solvents, known as Volatile Organic Compounds (VOCs), used in paints, thinners, strippers, cleaners, and consumer products evaporate and result in greater VOC emissions than all the oil refineries in California combined. In the presence of sunlight, VOCs participate in a complex reaction with oxides of nitrogen in the air to produce ground level ozone, a pollutant that causes lung, crop, and property damage.

Some VOCs may also be hazardous or toxic compounds. In addition to producing ozone, exposure to these toxic compounds may be hazardous to your health.

Air Emissions

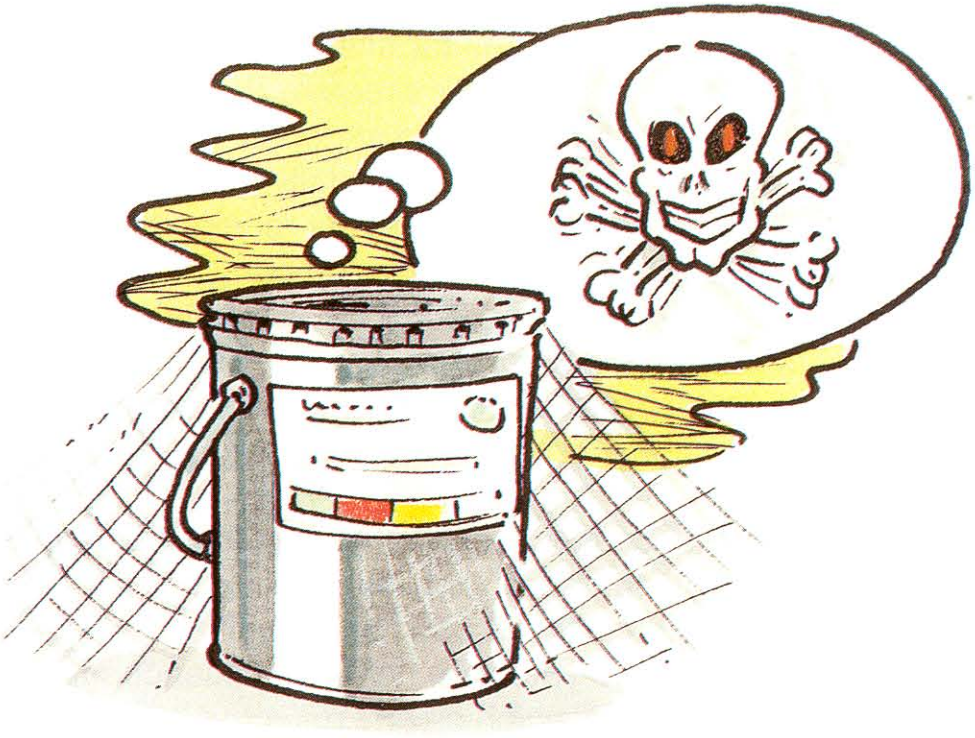
The major causes of air emissions in the wood products coatings and adhesives industry are the VOCs in clear sealers, clear topcoats, pigmented primers, sealers and undercoats, pigmented coats, fillers, stains, inks, toners, and washcoats. High VOC, high vapor pressure solvents evaporate quickly at room temperature, thus resulting in excess air emissions and greater material consumption. A switch to low VOC, low vapor pressure solvents will reduce air emissions and also result in decreased material consumption. There are a number of low VOC or non-VOC, low vapor pressure products available. It is highly recommended that you work with your vendors to identify these more environmentally friendly products.

Check with your local air pollution control district to see what the VOC requirements are for your area, and know the VOC content of your coatings!

Let's Talk About Some Approaches to a Successful Pollution Prevention Program

Inventory control, record keeping, employee training, and good housekeeping are keys to a company's environmental success.

Inventory Control



There are often instances where materials break down during extended storage time and become hazardous wastes. To avoid having to dispose of unused materials, incorporate the following steps into your inventory control procedures:

* Order materials on an as-needed basis.

* Mark purchase date on containers and monitor inventory to assure that older materials are used first.

* Consider substituting non-hazardous materials in place of hazardous materials.

* Purchase the smallest amount of solvents, coatings, and other chemicals to do the job; waste disposal costs for unused chemicals may be higher than the savings of buying materials in bulk quantities.

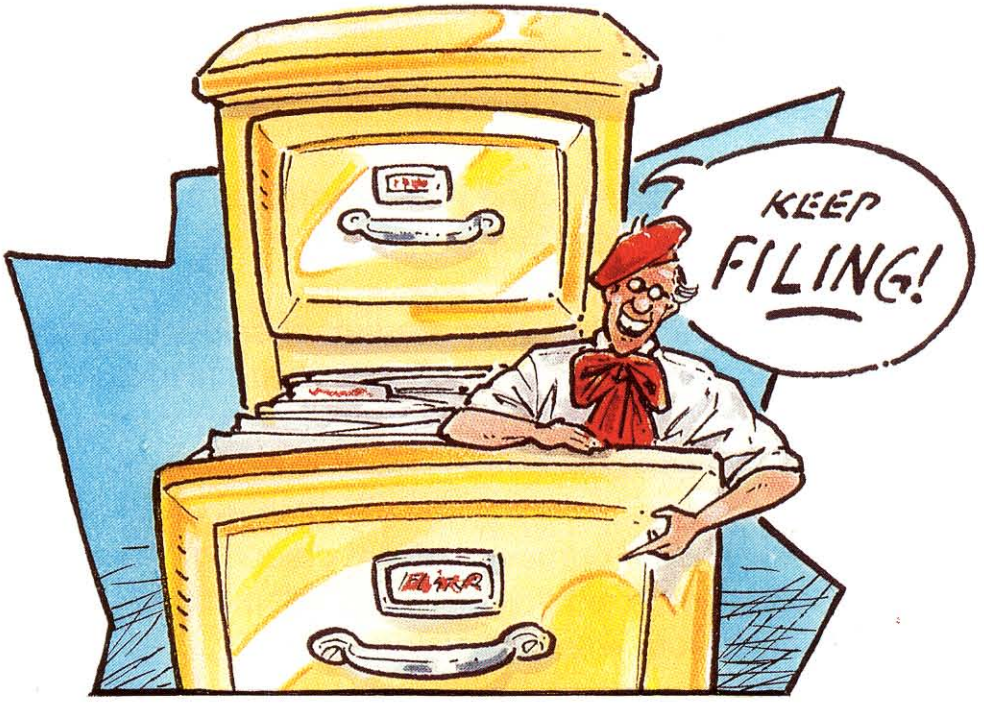
* Seek a multi-purpose solvent cleaning chemical rather than several different solvents; this will increase the chances of getting your waste recycled.

Record Keeping

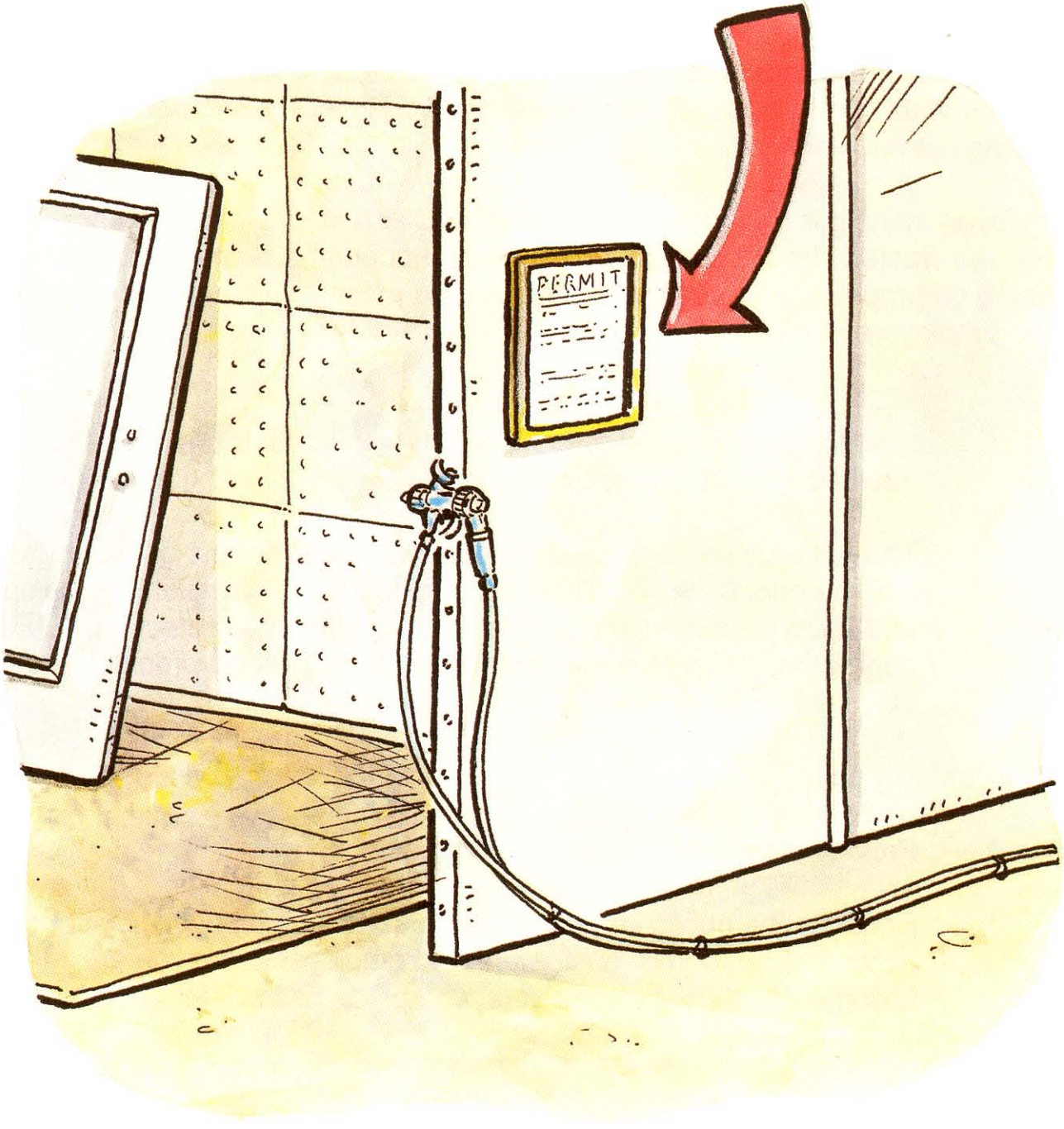
No commercial wood products coatings facilities are exempt from having to keep accurate records. District regulations require detailed daily usage records of coatings, reducers, and clean-up materials containing VOCs plus VOC content information. Keep track of your daily usage of all adhesives, coatings, sealers, and stains, in addition to every receipt, bill, and all manifests. Keep records of the waste hauler company, recycler, and storm water permits (if applicable) always on file. The latest Material Safety Data Sheets (MSDS) of all chemicals used in the facility must be readily available for reference, along with technical specification sheets and product technical bulletins.

Record keeping can also become an integral part of any pollution prevention program and has several advantages, including tracking production expenses which may enable you to cut costs. In addition, penalties for violations are based upon the number of days you were not in compliance. It is to your benefit to keep accurate records which clearly reflect your operations so any mistake which may occur can be limited to the minimum number of days. After implementing your program, evaluate records to identify possible source reductions.

Check with your local air pollution control district to see what the record keeping requirements are for you!



Display Your Permit Properly



District regulations require a "Permit to Operate" be posted in an accessible location. Remember, permits contain conditions which operators must meet. Make sure operators understand all permit requirements, even if this entails translating them into another language. Major NESHAP sources require a Federal EPA Title V permit.

Employee Training

It is important that employees are aware that the cost of a job or project is influenced by how they handle materials that may become excess air emissions or hazardous wastes if wasted. Even the best waste handling arrangements can fail unless workers are involved in and committed to carrying out the plans.

Employee training is important to minimize VOC and HAP emissions and materials waste. The NESHAP requires that all operators be given annual training on proper application methods, cleaning procedures, and equipment use. Employee training should include:

* How to use a minimal amount of solvents or other chemicals and maximize coating transfer efficiency.

* The importance of reading the MSDS. These sheets give key environmental, health and work place safety information. Reading an MSDS before making a purchase can help you select the appropriate solvent for the job and could help avoid problems down the road.

Proper training can:

* Provide a safer and healthier workplace.

* Enhance the public image of your business and reduce liability as well as show your customers and employees that you are taking extra steps to make your workplace better.

Follow Mixing Directions Carefully and, Read Between the Lines...

Coatings often require mixing with a thinner or catalyst. Always mix according to the manufacturer's instructions. Otherwise the coating may not adhere correctly, produce the desired finish, meet performance specifications, or comply with your local district air pollution control regulations.

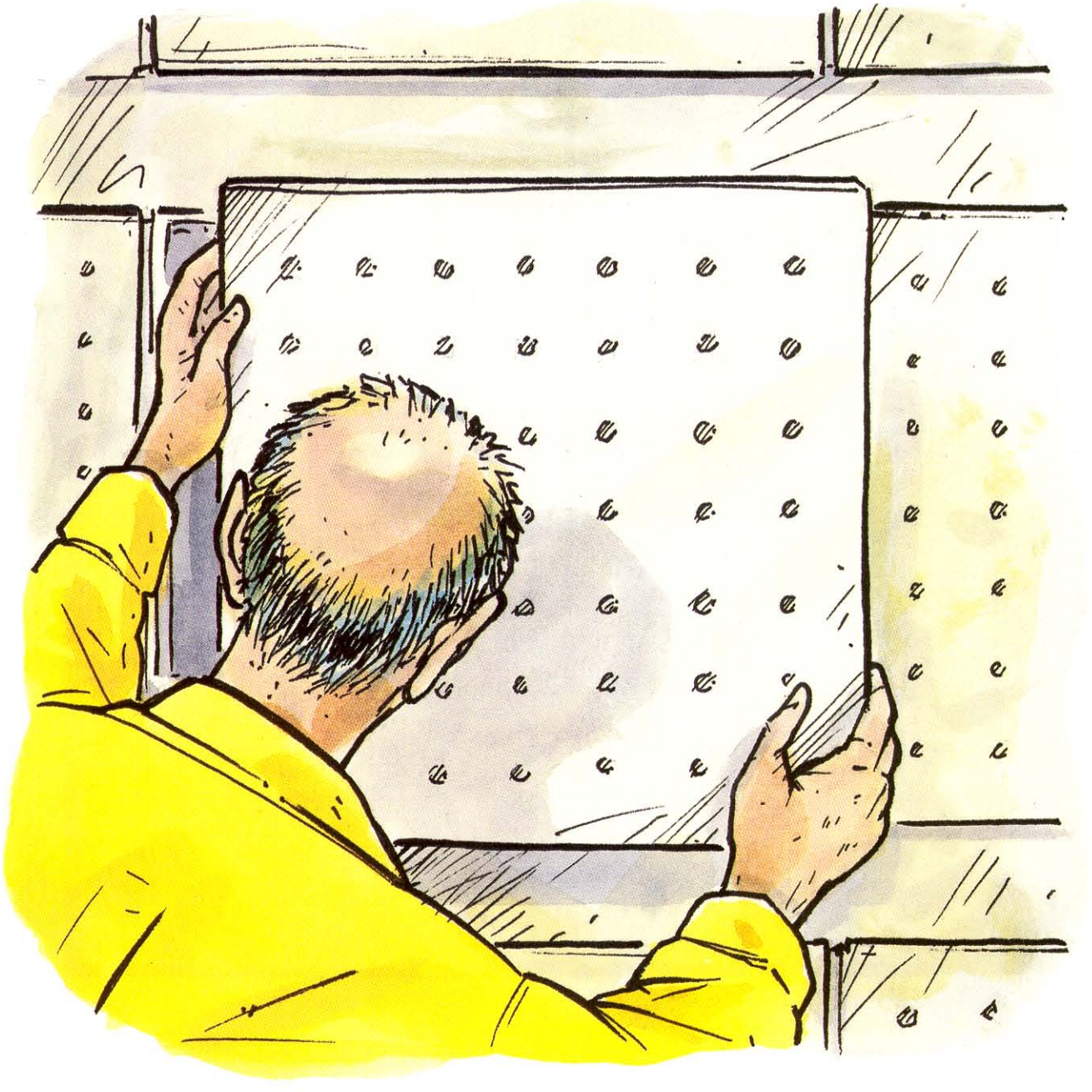
Never accept a contract which requires that you use coatings that do not comply with district requirements. You are liable for each day that non-complying coatings are used. Violations cost you $$$!

Materials Application

Local air pollution district requirements state you should use a high-volume, low-pressure (HVLP), electrostatic, or hand application method when coating all surfaces.

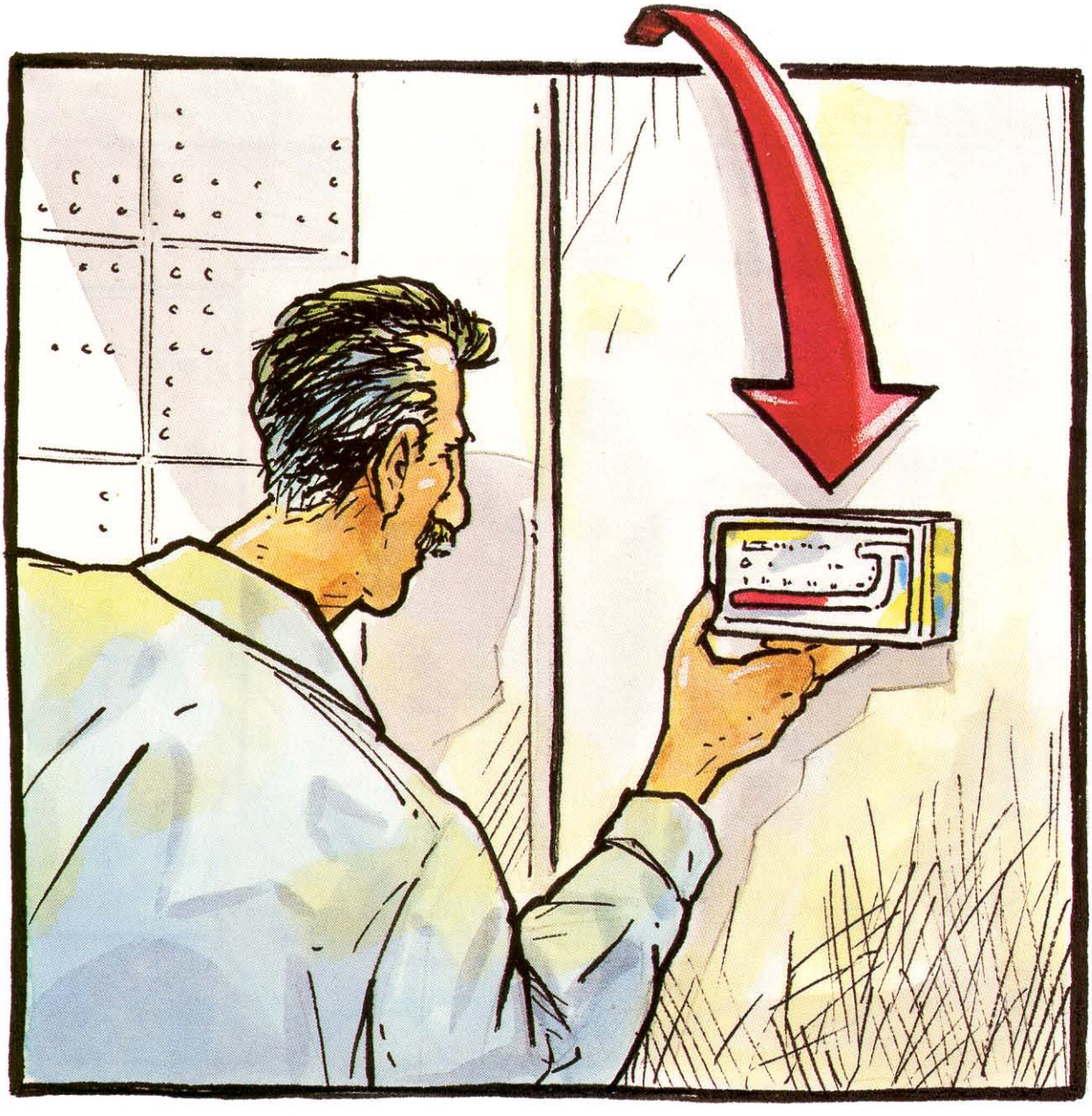
If the finish must be washed off, the NESHAP rules require that the number of parts washed off and the reason for the washoff be recorded.

Maintain Your Spray Booth Filters



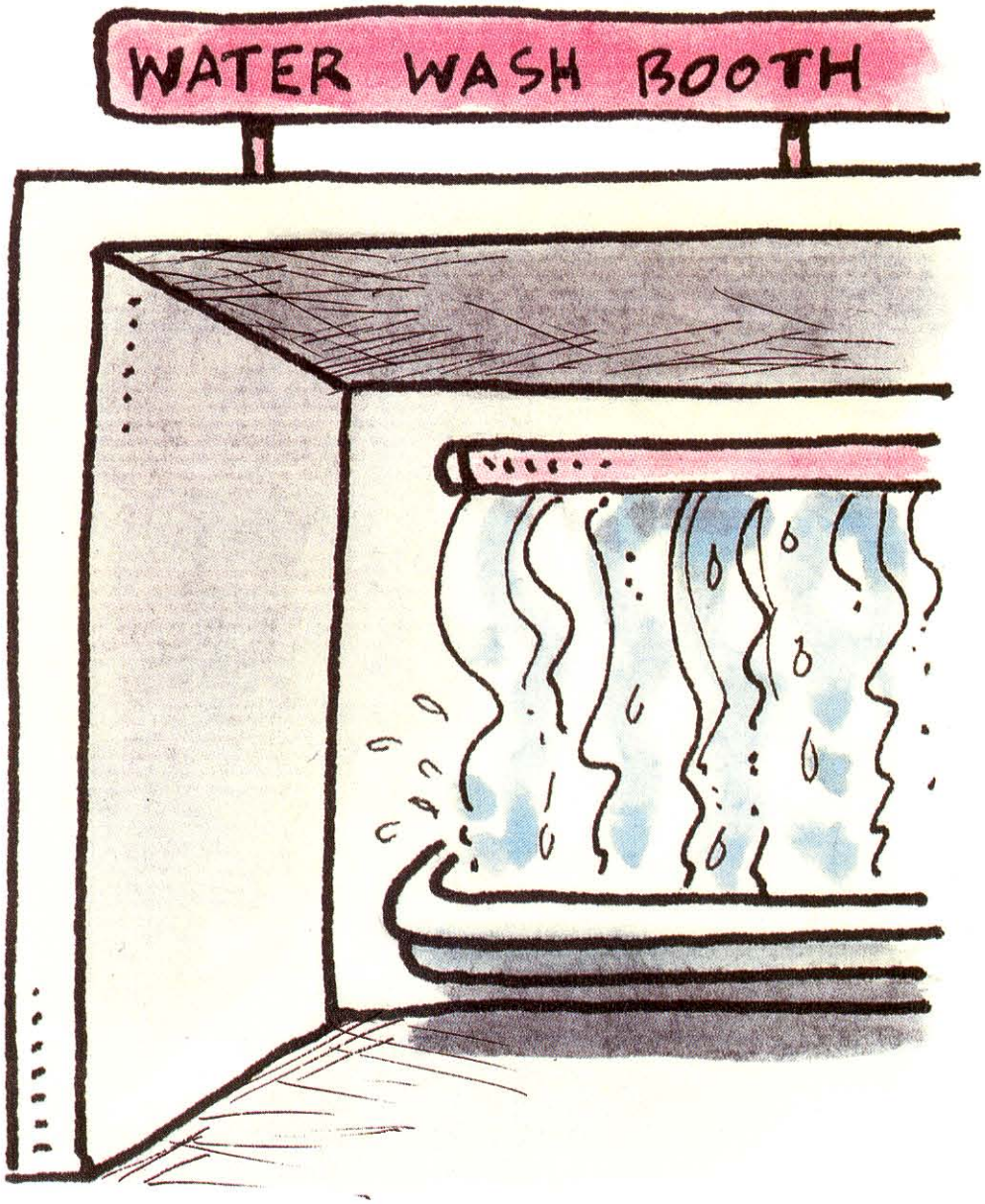
It is important to maintain your booth to ensure that your operation does not cause property damage. Paint overspray can travel through ineffective filters and damage the finish of automobiles and structures near your operation. Always make sure that the filters are installed properly and cover all openings. If your set-up requires dual filters, make sure both are in place.

Check Filter Pressure Gauge



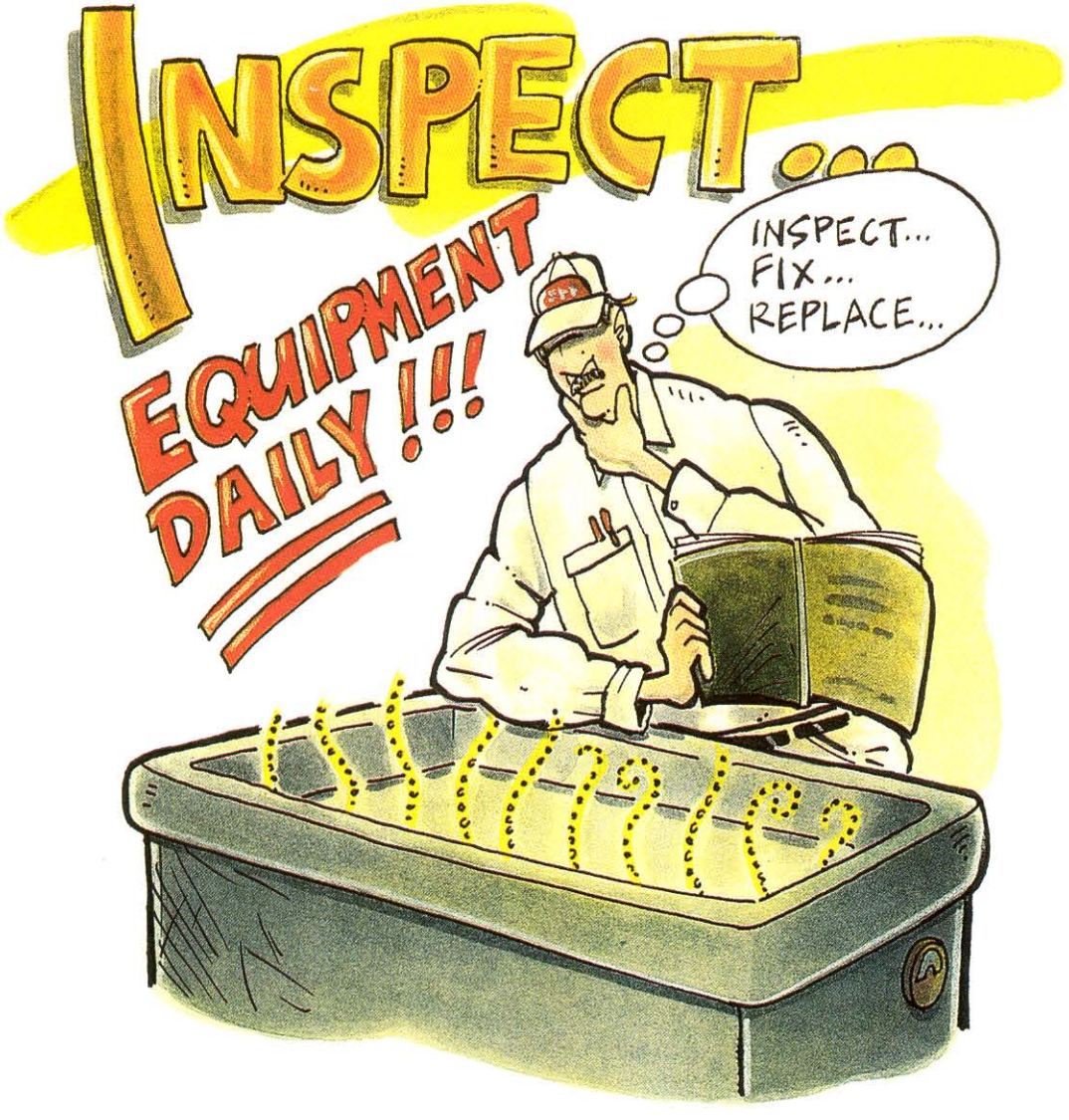
A manometer or a magnehelic gauge is used to determine the pressure drop across the spray booth filters. As the filter's pores become clogged, the pressure drop increases. Check your manometer frequently for accuracy and maintain its fluid level. Record pressure drop once per shift each day of booth use. Make sure the pressure drop does not exceed the limit (if one exists) in your permit conditions.

Keep Your Curtain Wet



Waterwash booths should provide a continuous sheet of water down the face of the rear booth panel. If the booth does not provide a continuous sheet of water, i.e., if dry spots appear, the water spray lines should be checked for clogged openings. Be sure to check and maintain the chemicals and additives in the water. Log water flow rate one per shift each day of booth operation. Clean the waterwash unit as necessary to ensure proper operation.

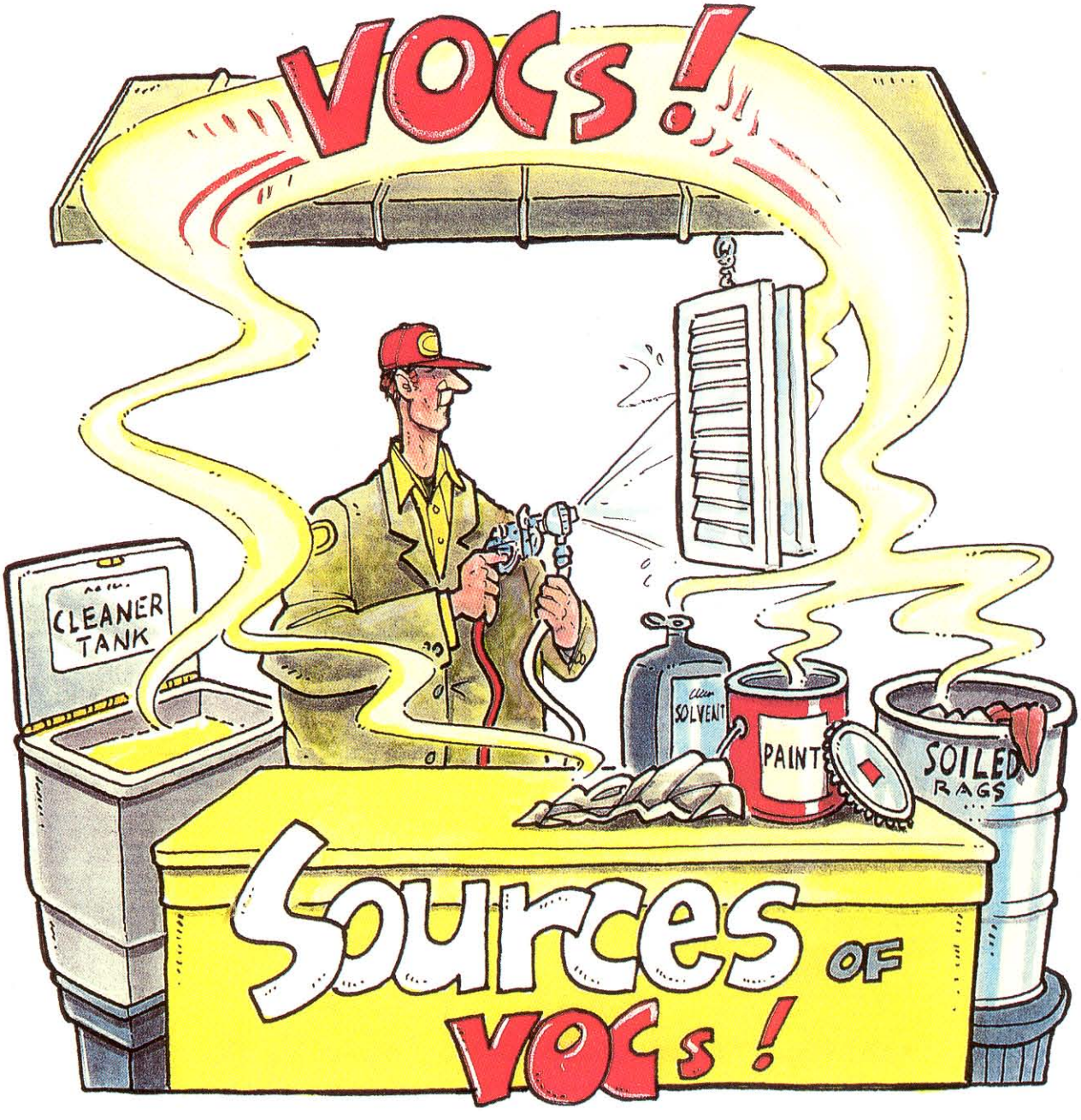
Inspect Your Equipment Often



Good operating and maintenance practices are essential to achieve the best performance and lowest emissions from even the best equipment. Maintain your control systems in accordance with the manufacturer's recommendations. If you **inspect** your machinery often and keep it in good working condition, you can improve the environment, improve working conditions, improve the quality of your products, and save money and jobs. If you find a problem, remove the equipment from service until you can **fix** it or have it **replaced.**

The **NESHAP** requires **monthly** inspections of all application equipment. Records must be kept of these monthly inspections.

Clean Equipment Properly



VOCs from your facility are reduced significantly by cleaning spray guns and equipment properly. Never clean lines by spraying solvents into the air or into filters. Purging lines in this manner wastes clean-up solvent and would be considered a violation. Always direct the clean-up solvents, using minimal pressure, into containers or soak spray guns in closed containers. Regulations **require** all VOC containers to be **tightly** sealed when not in use. Try to avoid the use of VOC solvents for clean-up, and choose non-VOC non-HAP materials where feasible.

Store Your Solvents Properly

Solvent vapor released in the workplace not only exposes employees to a potentially toxic substance, but eventually may find its way to the outside air or into residences or adjoining businesses. Your containers for the storage or disposal of cloth or paper used for solvent surface preparation and clean-up should be covered whenever they are not being used. This is also true when storing either fresh or spent solvent. Also, never leave containers of stripper, coating, adhesive, catalyst, or thinner open to the atmosphere when not in use.

These practices reduce solvent loss, prevent evaporation of emissions to the atmosphere, and reduce chances of fire.

Self-Inspection Checklists

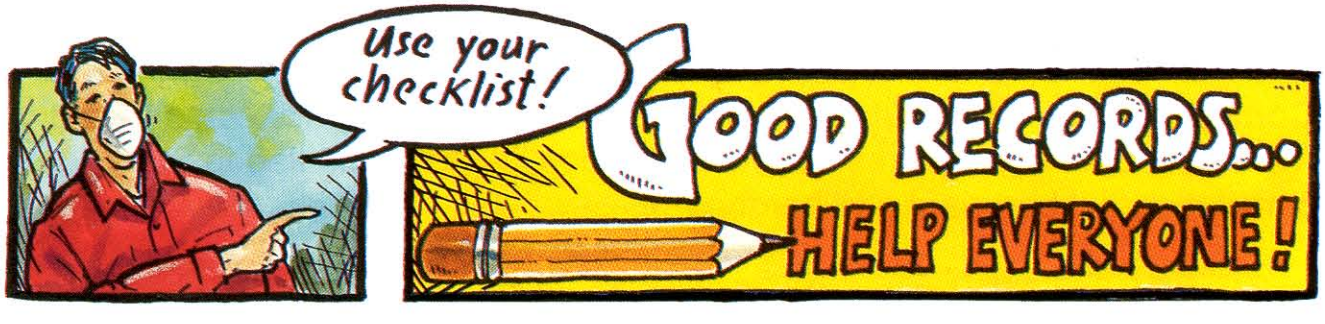
Self-inspection checklists are an easy way to keep more accurate records. Checklists, used with your wood products coatings handbook, will help you record emissions for VOCs as well as prepare you for your air pollution control inspection.

Keep all your records for at least five years or until the next district inspection, whichever period is longer. Please contact your local district for any specific forms they use when inspecting a wood product coating source.

Self-Inspection Checklist

Week of _____ to _____ Booth #s: _____

Item	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Notes:
Complying Coatings Used								
Recordkeeping Kept Daily, Incl. All VOC Materials								
Usage Under Permit Limits, All Permit Conditions Met								
Closed Containers								
Closed Waste Containers, Properly Stored & Disposed								
Booth Filter Condition ok, Water Curtain ok								
Manometer Fluid Level ok, Zero'ed Pressure ok								
Exhaust Fans ok								



Definitions

Aerosol Coating Product: pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can for hand-held application.

Airless Spray: equipment used to apply coatings by use of fluid pressure without atomizing air, including heated airless spray.

Air Assisted Airless Spray: equipment used to apply coatings that uses fluid pressure to atomize coating and air pressure to adjust the spray pattern.

Barrier Coat: coating applied to simulated wood components made from polypropylene, polystyrene, polyester, polyurethane, and other plastics to improve adhesion of waterborne coatings.

Binders: non-volatile polymeric organic materials (resins) which form the surface film in coating applications.

Capture Efficiency: ratio of weight of the VOC in the effluent stream entering the control device to the weight of VOC emitted from wood product coating operations, both measured simultaneously.

Clear Sealer: coating containing binders, but not opaque pigments, which seals the wood product prior to application of the subsequent coatings.

Clear Topcoat: final coating which contains binders, but not opaque pigments, and is specifically formulated to form a transparent or translucent solid protective film.

Coating: material applied to a surface and which forms a film in order to beautify and/or protect such surface.

Composite Wood: manufactured material consisting of tightly compressed wood fibers bonded with resins which includes, but is not limited to, particleboard, fiberboard and hardboard.

Control Device Efficiency: the ratio of the weight of the VOC removed by the control device from the effluent stream entering the control device to the weight of VOC in the effluent stream entering the control device; both measured simultaneously.

Conventional Air Spray: a spray coating method in which the coating is atomized by mixing it with compressed air at an air pressure greater than ten pounds per square inch (gauge) at the point of atomization.

Dip Coat: dipping an object into a vat of coating material and draining off any excess coating.

Electrostatic Application: charging of atomized paint droplets for deposition by electrostatic attraction.

Extreme Performance Coating: a two-component high-solids epoxy, urethane or polyester coating which requires the mixing of a resin and a catalyst, and is applied to a wood product to achieve a high gloss and/or high film build coat which cannot be achieved with a low-VOC coating, or to protect the wood product from one or more of the following environmental conditions: (a) repeated scrubbing with industrial grade detergents, cleaners, or abrasive scouring agents; or (b) frequent exposure to water, to outdoor weather, or to ultraviolet radiation.

Filler: a material which is applied to a wood product, and whose primary function is to build up, or fill the voids and imperfections in the wood product to be coated. This shall not include composite wood edge filler.

Flow Coat: to coat an object by flowing a stream of coating over an object and draining off any excess coating.

Glazes: type of stain used to soften or blend the original color without obscuring it.

High Film Build: when the dry-film thickness per application is greater than four thousandths of an inch.

High Gloss: when a coating surface shows a reflectance of 75 or more on a 60 degree meter.

High-Solid Stains: stains containing more than one pound of solids per gallon of material, and include wiping stains, glazes, and opaque stains.

High-Volume, Low-Pressure (HVLP) Spray: equipment used to apply coating by means of a spray gun which is designed to be operated and which

is operated between 0.1 and 10.0 pounds per square inch gauge (psig) air pressure, measured dynamically at the center of the air cap and at the air horns.

Ink: a fluid that contains dyes and/or colorants and is used to make markings, but not to protect surfaces.

Low-Solids Coating: a coating containing one pound, or less, of solids per gallon of material.

Mold-Seal Coating: initial coating applied to new mold or repaired mold to provide a smooth surface which, when coated with a mold release coating, prevents products from sticking to the mold.

Multi-Colored Coating: a coating which exhibits more than one color when applied, and which is packaged in a single container and applied in a single coat.

Overall Control Efficiency: the ratio of the weight of the VOC removed by the emission control system to the total weight of VOC emitted from wood product coating operations, both measured simultaneously.

Paint: an opaque pigmented coating.

Pigmented Primers, Sealers, and Undercoats: opaque coatings which contain binders and colored pigments formulated to hide the wood surface, that are applied prior to the topcoat to provide a firm bond, level the wood product surface, or seal the wood product surface.

Pigmented Topcoat: final opaque coating which contains binders and colored pigments, and is specifically formulated to hide the wood surface and form a solid protective film.

Potential to Emit: the maximum capacity of a facility to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation, emissions, or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable.

Pounds of VOC per Pound of Solids: the weight of VOC per weight of coating solids within any given volume of coating.

Reactive Diluent: a liquid which is a VOC during application and one in which, through chemical or physical reactions, such as polymerization, 20 percent or more becomes an integral part of a finished coating.

Rate per Day: the amount applied between 12:00 a.m. and 11:59 p.m. on the same calendar day.

Rate Per Calendar Year: the amount applied between 12:00 a.m. January 1, and 11:59 p.m. December 31.

Refinish: the recoating of wood products that have been previously coated.

Repair Coating: a coating used to recoat portions of a wood product which has sustained damage to the coating following normal painting operations.

Roll Coater: a series of mechanical rollers that applies a thin coating on the wood product.

Stain: any colorcoat having a solids content by weight of no more than 8.0% that is applied in single or multiple coats directly to the substrate. It includes, but is not limited to, nongrain raising stains, equalizer stains, prestains, sap stains, body stains, no-wipe stains, penetrating stains, and toners.

Stripper: a liquid used to remove cured coatings, cured inks and/or cured adhesives.

Toner: a wash coat which contains binders and dyes or pigments to add tint to a coated surface.

Touch-Up Coating: a coating used to cover minor coating imperfections appearing after the main coating operation.

Transfer Efficiency: the ratio of the weight of coating solids deposited on an object to the total weight of coating solids used in a coating application step, expressed as a percentage.

VOC Composite Partial Pressure: the sum of the partial pressures of the compounds defined as VOCs.

Volatile Organic Compounds (VOCs): any volatile compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.

Washcoat: coating containing no more than 1.0 pound of solids per gallon of material, and which is used to seal wood product surfaces, to prevent undesired staining, control penetration, provide a barrier when paper laminates are applied to the wood product, seal glazes, or improve adhesion of a waterborne topcoat.

Wood Furniture: (NESHAP definition) means any product made of wood, a wood product such as rattan or wicker, or an engineered wood product such as particleboard that is manufactured under any of the following standard industrial classification codes: 2434, 2511, 2512, 2517, 2519, 2521, 2531, 2541, 2599, or 5712.

Wood Products: surface-coated room furnishings which include cabinets, tables, chairs, beds, sofas, shutters, art objects, and any other coated objects made of wood, composite wood, simulated wood material used in combination with wood or composite wood, and/or paper laminated on composite wood.

Wood Product Coating Application Operations: a combination of coating application steps which may include use of spray guns, flash-off areas, spray booths, ovens, conveyors, and/or other equipment operated for the purpose of applying coating materials.

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Need More Information?

Air Resources Board (800) 952-5588 **District: _____**

Multi-County Districts

1 - Bay Area (415) 749-5000
2 - Feather River (530) 634-7659
3 - Great Basin (760) 872-8211
4 - Monterey Bay (831) 647-9411
5 - North Coast (707) 443-3093
6 - Northern Sierra (530) 274-9360
7 - South Coast (909) 396-2000
8 - Yolo-Solano (530) 757-3650
9 - San Joaquin Valley (559) 230-6000

County Districts

Amador (209) 257-0112
Antelope Valley (661) 723-8070
Butte (530) 891-2882
Calaveras (209) 754-6504
Colusa (530) 458-0590
El Dorado (530) 621-6662
Glenn (530) 934-6500
Imperial (760) 482-4606
Kern (661) 862-5250
Lake (707) 263-7000
Lassen (530) 251-8110
Mariposa (209) 966-2220
Mendocino (707) 463-4354
Modoc (530) 233-6419
Mojave Desert (760) 245-1661
No. Sonoma (707) 433-5911
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San Diego (858) 650-4700
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