

RULE 466 - SOLVENT CLEANING
Adopted 5-23-02**INDEX****100 GENERAL**

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100 GENERAL

- 101 **PURPOSE:** To reduce the emissions of volatile organic compounds from solvent cleaning operations and activities, and from the storage and disposal of new and spent cleaning solvents.
- 102 **APPLICABILITY:** Except as provided in Section 110, this rule applies to all persons who use VOC-containing materials in solvent cleaning operations during the production, repair, maintenance or servicing of parts, products, tools, machinery, or equipment, or in general work areas, and to all persons who store and dispose of VOC-containing materials used in solvent cleaning. The rule also applies to sellers of VOC-containing materials for use in solvent cleaning operations.
- 103 **SEVERABILITY:** If a court of competent jurisdiction issues an order that any provision of this rule is invalid, it is the intent of the Board of Directors of the District that other provisions of this rule remain in full force and effect, to the extent allowed by law.
- 110 **EXEMPTIONS:**
- 110.1 The provisions of this rule do not apply to cleaning operations specifically subject to requirements under the following rules:
- a. Rule 444 – PETROLEUM SOLVENT DRY CLEANING;
 - b. Rule 450 – GRAPHIC ARTS OPERATIONS;
 - c. Rule 451 – SURFACE COATING OF MISCELLANEOUS METAL PARTS AND PRODUCTS;
 - d. Rule 452 – CAN COATING;
 - e. Rule 454 – DEGREASING OPERATIONS
 - f. Rule 456 – AEROSPACE ASSEMBLY AND COMPONENT COATING OPERATIONS;
 - g. Rule 459 – AUTOMOTIVE, TRUCK AND HEAVY EQUIPMENT REFINISHING OPERATIONS;
 - h. Rule 460 – ADHESIVES AND SEALANTS;
 - i. Rule 463 - WOOD PRODUCTS COATING;
 - j. Rule 464 – ORGANIC CHEMICALS MANUFACTURING OPERATIONS; and
 - k. Rule 465 – POLYESTER RESIN OPERATIONS; and.
- 110.2 The provisions of this rule shall not apply to the following:
- a. Cleaning using solvents that contain 50 grams per liter or less VOCs as applied including water and exempt compounds;
 - b. Cleaning of solar cells, laser hardware, scientific instruments, and high-precision optics;
 - c. Cleaning of cotton swabs to remove cottonseed oil before cleaning of high-precision optics;
 - d. Cleaning of paper-based gaskets and clutch assemblies where rubber is bonded to metal by means of an adhesive;
 - e. Cleaning of application equipment used to apply coatings on satellites and radiation effect coatings;
 - f. Cleaning of electrostatic coating application equipment; and
 - g. Janitorial cleaning, including graffiti removal.
- 110.3 The provisions of this rule, except for the recordkeeping requirements in Section 501, shall not apply to the following:
- a. Cleaning of sterilization ink indicating equipment provided that the solvent usage is less than 1.5 gallons per day;
 - b. Cleaning with aerosol provided that 160 fluid ounces or less of aerosol product are used per day, per stationary source.
- 110.4 The provisions of Section 302.2 shall not apply to the cleaning of the nozzle tips of automated spray equipment systems, except for robotic systems.

200 DEFINITIONS

- 201 **ADHESIVE:** Any material that is used to bond one surface to another surface by attachment.
- 202 **AEROSOL CLEANING SOLVENT:** A material used as a surface preparation solvent, a cleanup solvent, or as a stripper and consisting of liquid and/or gaseous solvent and propellants packaged in a hand-held, pressurized, non-refillable container. The container expels pressurized aerosol materials when a valve on the container is depressed.
- 203 **APPLICATION EQUIPMENT:** A device used to apply adhesive, coating, ink, or polyester resin materials.
- 204 **APPURTENANCES:** Accessories to a stationary structure, including, but not limited to: hand railings, cabinets, bathroom and kitchen fixtures, fences, rain-gutters and down-spouts, window screens, lamp-posts, heating and air conditioning equipment, other mechanical equipment, large fixed stationary tools and concrete forms.
- 205 **ARCHITECTURAL COATINGS:** Any coating applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.
- 206 **ARCHITECTURAL COATINGS APPLICATION EQUIPMENT CLEANING:** The cleaning of architectural coating application equipment such as paint spray guns, brushes, and hoses. For purpose of this rule, the cleaning of architectural coating application equipment used for coating of prefabricated architectural components are not subject to the requirements of this rule.
- 207 **CLOSED CONTAINER:** A container which has a nonabsorbent cover where the cover meets with the main body of the container without any visible gaps between the cover and the main body of the container.
- 208 **COATING:** A material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealers, and stains.
- 209 **DEGREASER:** A tank, tray, drum, or other container in which the objects to be cleaned are exposed to a solvent or solvent vapor in order to remove contaminants.
- 210 **ELECTRICAL APPARATUS COMPONENTS:** An internal component such as wires, windings, stators, rotors, magnets, contacts, relays, energizers, and connections in an apparatus that generates or transmits electrical energy including, but not limited to: alternators, generators, transformers, electric motors, cables, and circuit breakers, except for the actual cabinet in which the components are housed. Electrical components of graphic arts application equipment and hot-line tools are also included in this category.
- 211 **ELECTRONIC COMPONENTS:** The portion of an assembly, including circuit board assemblies, printed wire assemblies, printed circuit boards, soldered joints, ground wires, bus bars, and other electrical fixtures, except for the actual cabinets in which the components are housed.
- 212 **ENCLOSED GUN CLEANER:**
- 212.1 A device that is used for the cleaning of spray guns, cups, pots and hoses, that has an enclosed solvent container, is not open to the ambient air when in use, and has a mechanism to force the cleanup material through the gun while the cleaner is in operation; or
- 212.2 A device that is used for the cleaning of spray guns, cups, pots and hoses, that has an enclosed solvent container, uses non-atomized solvent flow to flush the spray equipment and collects and returns the discharged solvent to the enclosed container.

- 213 **EXEMPT COMPOUND:** For the purposes of this rule, “exempt compound” has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.
- 214 **HIGH PRECISION OPTICS:** An optical element used in an electro-optical device and is designed to sense, detect, or transmit light energy, including specific wavelengths of light energy and changes in light energy levels.
- 215 **HOT-LINE TOOL:** A specialized tool used primarily on the transmission systems, sub-transmission systems and distribution systems for replacing and repairing circuit components or for other types of work with electrically energized circuits.
- 216 **INK:** Any fluid or viscous composition used in printing, impressing, or transferring an image onto a substrate.
- 217 **JANITORIAL CLEANING:** The cleaning of building or facility components including, but not limited to, floors, ceilings, walls, windows, doors, stairs, and bathrooms.
- 218 **KEY SYSTEM OPERATING PARAMETER:**
- 218.1 A variable that is critical to the operation of an emission control system and that ensures:
- a. Operation of the system within the system manufacturer’s specifications, and
 - b. Compliance with the overall system efficiency standard required by Section 305.
- 218.2 Such variables may include, but are not limited to:
- a. Hours of operation,
 - b. Temperature,
 - c. Flow rate, and
 - d. Pressure.
- 219 **LEAK:** A leak is:
- 219.1 The dripping of liquid volatile organic compounds in excess of three drops per minute; or
- 219.2 The appearance of a visible mist.
- 220 **MAINTENANCE CLEANING:** A solvent cleaning operation or activity carried out to keep tools, machinery, or general work areas clean and in good operational condition.
- 221 **MANUFACTURING PROCESS:** The process of making goods or articles by hand or by machinery.
- 222 **MEDICAL DEVICE:** An instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article, including any component or accessory, that meets one of the following conditions:
- 222.1 it is intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease; or
- 222.2 it is intended to affect the structure or any function of the body; or
- 222.3 it is defined in the National Formulary or the United States Pharmacopoeia, or any supplement to them.
- 223 **NON-ABSORBENT CONTAINER:** A container made of nonporous material, which does not allow the migration of the liquid solvent through it.
- 224 **NON-ATOMIZED SOLVENT FLOW:** The use of a solvent in the form of a liquid stream without atomization to remove uncured adhesives, uncured inks, uncured coatings, and contaminants from an article.

- 225 **NON-COMPLIANT SOLVENT:** A solvent that:
- 225.1 exceeds the VOC content limits specified in Section 301, and
 - 225.2 is not exempt pursuant to Section 110, and
 - 225.3 is used a facility that does not use emission control equipment pursuant to Section 304, and
 - 225.4 is used a facility that does not use an alternative compliance option pursuant to Rule 107, ALTERNATIVE COMPLIANCE.
- 226 **NON-LEAKING CONTAINER:** A container without leak.
- 227 **PLATELET DEVICES:** A very precision photo chemically etched metallic plates that are diffusion bonded (high pressure and heat) to make a monolithic part. The details of these parts can be as small as .00005 inches.
- 228 **POLYESTER RESIN:** Unsaturated polyester resin such as isophthalic, orthophthalic, halogenated, bisphenol-A, vinyl-ester, or furan resin; cross-linking agent; catalyst, gel coat, inhibitor, accelerator, promoter, and any other VOC-containing material comprising a resin made from polyester. Inert filler and cleaning material are excluded from this definition.
- 229 **PREFABRICATED ARCHITECTURAL COMPONENTS:** Prefabricated metal parts and products which are to be used as architectural appurtenances or structures and which are coated in a shop environment, not including window frames and door frames.
- 230 **PRODUCT CLEANING:** The cleaning of parts or components in a process of making goods or articles by hand or by machinery from those parts or components.
- 231 **RADIATION-EFFECT COATING:** A material that prevents radar detection.
- 232 **REPAIR CLEANING:** A solvent cleaning operation or activity carried out during a repair process or as part of a scheduled maintenance procedure during which the parts are removed.
- 233 **REPAIR PROCESS:** The process of returning a damaged object or an object not operating properly to good condition.
- 234 **SCIENTIFIC INSTRUMENT:** An instrument (including the components, assemblies, and subassemblies used in their manufacture) and associated accessories and reagents that is used for the detection, measurement, analysis, separation, synthesis, or sequencing of various compounds.
- 235 **SOLVENT:** Any liquid containing a volatile organic compound or combination of volatile organic compounds, which is used to perform solvent cleaning.
- 236 **SOLVENT CLEANING:** The removal of loosely held uncured adhesives, uncured inks, uncured coatings, and contaminants which include, but are not limited to, dirt, soil, and grease from parts, products, tools, machinery, equipment, and general work areas. Each distinct method of cleaning in a cleaning process, which consists of a series of cleaning methods, shall constitute a separate solvent cleaning operation.
- 237 **SOLVENT FLUSHING:** The use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of the equipment by flushing solvent through the equipment.
- 238 **STERILIZATION INDICATING INK:** Ink that changes color to indicate that sterilization has occurred. Such ink is used to monitor the sterilization of medical instruments, autoclave efficiency, and the thermal processing of foods for prevention of spoilage.

- 239 **STATIONARY SOURCE:** Any building, structure, facility, or emissions unit which emits or may emit any affected pollutant directly or as a fugitive emission.
- 239.1 Building, structure, facility, or emissions unit includes all pollutant emitting activities which:
- a. Belong to the same industrial grouping, and
 - b. Are located on one property, or two or more contiguous properties, and
 - c. Are under the same or common ownership, operation, or control, or which are owned or operated by entities which are under common control.
- 239.2 Pollutant emitting activities shall be considered as part of the same industrial grouping if:
- a. They belong to the same two-digit Standard Industrial Classification (SIC) code, or
 - b. They are part of a common production process, which includes industrial processes, manufacturing processes and any connected processes involving a common material.
- 240 **VOLATILE ORGANIC COMPOUND (VOC):** For the purpose of this rule, "volatile organic compound" has the same meaning as in Rule 101—GENERAL PROVISIONS AND DEFINITIONS.
- 241 **VOLATILE ORGANIC COMPOUND (VOC) AS APPLIED:** A VOC as applied means the VOC content of the cleaning solvent as applied, including any diluters, as calculated pursuant to Section 502.1.
- 242 **WIPE CLEANING:** The method of cleaning a surface by physically rubbing it with a material such as a rag, paper, sponge or a cotton swab moistened with a solvent.

300 STANDARDS**301 VOC STANDARDS:**

301.1 A person shall not perform solvent cleaning unless the solvent has a VOC content, as applied (as determined per Section 502.1) equal to or less than the applicable VOC limit in the table below. The VOC content shall be calculated based on grams per liter of solvent or pounds per gallon of solvent including water and exempt compounds.

Solvent Cleaning Activity	VOC Content g/l (lb/gal)
	5/22/03
General (wipe cleaning, maintenance cleaning)	50 (0.42)
Product Cleaning During Manufacturing Process or Surface Preparation for Coating, Adhesive, Sealants, or Ink Application	
General	50 (0.42)
Electrical Apparatus Components and Electronic Components	500 (4.2)
Medical Devices and Pharmaceuticals	800 (6.7)
Platelets	800 (6.7)
Repair and Maintenance Cleaning	
General	50 (0.42)
Electrical Apparatus Components and Electronic Components	900 (7.5)
Medical Devices and Pharmaceuticals	
General Work Surfaces	600 (5.0)
Tools, Equipment, and Machinery	800 (6.7)
Platelets	800 (6.7)
Architectural Coating Application Equipment	
Water based Coatings	50 (0.42)
Solvent based Coatings – Jobsite and no Enclosed Gun Cleaner	300 (2.5)

302 CLEANING DEVICES AND METHODS REQUIREMENTS: A person shall not perform solvent cleaning unless one of the following cleaning devices or methods is used:

- 302.1 Wipe cleaning;
- 302.2 Cleaning within closed containers or by using hand held spray bottles from which solvents are applied without a propellant-induced force;
- 302.3 Using cleaning equipment which has a solvent container that is closed during cleaning operations, except when depositing and removing objects to be cleaned, and is closed during non-operation with the exception of maintenance and repair to the cleaning equipment itself;
- 302.4 Using remote reservoir degreaser, non-vapor degreaser, or vapor degreaser used pursuant to the provisions of Rule 454, DEGREASING OPERATIONS; or
- 302.5 Using solvent flushing methods where the cleaning solvent is discharged into a container which is closed except for solvent collection openings and, if necessary, openings to avoid excessive pressure buildup inside the container. The discharged solvent from the equipment must be collected into containers without atomizing into the open air. The solvent may be flushed through the system by air or hydraulic pressure, or by pumping.
- 302.6 Using an enclosed gun cleaner for cleaning of application equipment, except as listed in Section 302.7 or by using a solvent that contains 50 grams per liter or less VOCs for cleaning of spray guns if no enclosed gun cleaner is used;
- 302.7 Using solvents that comply with the VOC limits in Section 301 and cleaning methods in Section 302.5 for cleaning of application equipment used to apply architectural coatings at the jobsite; or

- 302.8 Cleaning of spray gun nozzles by soaking in solvent provided the container (not to exceed five (5) gallons in size) is kept tightly covered at all times except when accessing the container.

303 **STORAGE AND DISPOSAL REQUIREMENTS**

- 303.1 All solvents shall be stored in closed containers when not in use. The container shall be:
- Nonleaking, and
 - Nonabsorbent.
- 303.2 All spent solvents shall be disposed of properly. Spent cleanup solvents may be classified as hazardous waste. The owner or operator shall obtain approval from applicable local, state, or federal water pollution control agency prior to disposing of spent solvents into the sewer or storm drain systems.

304 **EMISSIONS CONTROL EQUIPMENT:** As an alternative to complying with Sections 301 and 302, a person may use air pollution control equipment provided it satisfies the following:

- 304.1 The air pollution control equipment is approved by the Air Pollution Control Officer pursuant to Rule 201, General Permit Requirements, and
- 304.2 The air pollution control equipment is designed and operated with:
- A control device efficiency of at least 95 percent on a mass basis, as determined pursuant to Sections 403 and 502.3, and
 - An emission collection efficiency of at least 90 percent on a mass basis of the emissions generated by the solvent cleaning operations, as determined pursuant to Section 502.4, or
 - An output of less than 50 parts per million calculated as carbon with no dilution.

400 **ADMINISTRATIVE REQUIREMENTS**

- 401 **COMPLIANCE SCHEDULE:** Any person subject to this rule shall be in compliance with the requirements of this rule no later than May 22, 2002.

- 402 **CALCULATION FOR DETERMINING VOC CONTENT OF CLEANING SOLVENTS INCLUDING WATER AND EXEMPT COMPOUNDS:** For the VOC content as applied, the volume of solvent is defined as the volume of the original solvent, plus any material added to the original solvent (e.g., thinners or reducers). For the VOC content as supplied, the volume of solvent is defined as the volume of the original solvent. The weight of VOC per total volume of solvent shall be calculated by the following equation:

$$G_2 = \frac{W_v - W_w - W_{ec}}{V_m}$$

- Where: G_2 = Weight of VOC per total volume of solvent, in grams per liter
- W_v = Weight of all volatile compounds, in grams
- W_w = Weight of water, in grams
- W_{ec} = Weight of m compounds, in grams
- V_m = Volume of solvent, in liters

- 403 **CALCULATION FOR DETERMINING PERCENT CONTROL EFFICIENCY AND VOC MASS EMISSION RATE:** The VOC mass emission rate shall be calculated both upstream and downstream of the emissions control device based on the VOC mass concentration, collection efficiency, and volumetric flowrate, pursuant to Section 502.3, 502.4, and 502.5 and the following equations:

404.1 **VOC Mass Emission Rate:**

$$M = (Q) * (C) * \left(60 \frac{m}{hr}\right) \text{ (calculated upstream and downstream)}$$

Where: M = VOC mass emission rate (upstream/downstream), in lb/hr.
 Q = the volumetric flowrate at the inlet (upstream) or exhaust stack outlet (downstream), in standard cubic feet per minute as determined by Sections 502.3 and 502.5.
 C = the VOC mass concentration at the inlet (upstream) or outlet (downstream), in pounds per standard cubic feet, as determined pursuant to Section 502.3.

404.2 **The percent control efficiency is calculated as follows:**

$$\%CE = \left(\frac{M_u - M_d}{M_u} \right) * 100$$

Where: CE = control efficiency.
 M_u = the upstream VOC mass emission rate, in lb/hr.
 M_d = the downstream VOC mass emission rate, in lb/hr.

- 404 **OPERATION AND MAINTENANCE PLAN:** Any person using an approved emission control device pursuant to Section 305 must submit an Operation and Maintenance Plan for the emissions control to the Air Pollution Control Officer for approval. This Plan shall specify operation and maintenance procedures that demonstrate continuous operation and compliance of the emissions control equipment during periods of emissions-producing operations. This Plan shall specify key system operating parameters, such as temperatures, pressures, and/or flow rates, necessary to determine compliance with this rule and shall describe in detail procedures to maintain the approved control device. The plan shall specify which records must be kept to document these operations and maintenance procedures. The records shall comply with the requirements of Section 501. This Plan shall be implemented upon approval by the Air Pollution Control Officer.
- 405 **PRODUCT INFORMATION REQUIREMENTS FOR SELLERS:** Any person who sells any solvent subject to this rule shall make available to the purchaser at the time of sale the following information:
- 405.1 The solvent type by name/code/manufacturer;
- 405.2 The maximum VOC content of the cleanup solvent as applied. The VOC content shall be displayed as grams of VOC per liter of solvent (or pounds of VOC per gallon), including water and exempt compounds as determined pursuant to Section 502.1.
- 405.3 Recommendations regarding thinning, reducing, or mixing with any solvent, if applicable.

500 MONITORING AND RECORDS

- 501 **RECORDKEEPING:**
- 501.1 **List of Solvents:** A list shall be maintained of all solvents currently used and/or stored at the site. The list shall include the following information:
- Cleaning solvent type by name/code/manufacturer.
 - The actual VOC content of cleaning solvents listed in Section 301, as applied including water and exempt compounds.
 - The actual mixing ratio for the cleaning solvent as applied.
- 501.2 **Product Information:** The information listed under Section 405 shall be maintained on-site and made available to the Air Pollution Control Officer upon request.
- 501.3 **Usage Records:** Any person within the District using cleaning solvents regulated by this rule shall update and maintain the records as required by this rule as follows:
- Daily:**
 - Records of total applied volume in gallons per day of solvents used for cleaning of sterilization ink indicating equipment.
 - Records of total volume of aerosol products in ounces used.

- b. **Monthly:**
 - 1. Record of total applied volume in gallons for each cleaning solvent used, and
 - 2. Record of solvent cleaning activity associated with each solvent used.
 - 501.4 **Emission Control Equipment:** Any person using an emission control device pursuant to this rule shall maintain records, on a daily basis, of key system operating parameters for emission control equipment, including, but not limited to:
 - a. Hours of operation;
 - b. Routine and non-routine maintenance; and
 - c. The records required by Section 404 as part of the Operation and Maintenance Plan.
 - d. Records of test reports conducted pursuant to Section 502.
 - 501.5 **Duration of Records:** Such records shall be maintained on-site for a continuous three-year period and made available for review by the Air Pollution Control Officer upon request.
- 502 **TEST METHODS:**
- 502.1 **DETERMINATION OF VOC CONTENT:** The VOC content of the cleaning solvent shall be determined in accordance with United States Environmental Protection Agency. Method 24 and Section 402 of this rule.
 - 502.2 **DETERMINATION OF COMPOUNDS EXEMPT FROM VOC DEFINITION:** Exempt compounds referenced in Section 212 and listed in Rule 101 – General Provisions and definitions, shall be determined in accordance with ASTM D 4457-91 or California Air Resources Board Method 432. If any of the perfluorocarbons or volatile cyclic and linear methyl siloxanes are being claimed as exempt compounds, the person making the claim must state in advance which compounds are present, and the United States Environmental Protection Agency -approved test method used to make the determination of these compounds.
 - 502.3 **DETERMINATION OF CONTROL EFFICIENCY:** Control efficiency of the emissions control equipment shall be determined in accordance with United States Environmental Protection Agency Method 18, 25, or 25A (whichever is applicable).
 - 502.4 **DETERMINATION OF COLLECTION EFFICIENCY:** Efficiency of the collection system shall be determined in accordance with the United States Environmental Protection Agency's *Guidelines for Determining Capture Efficiency, January 9, 1995*. Individual capture efficiency test runs subject to United States Environmental Protection Agency technical guidelines shall be determined by:
 - a. Applicable United States Environmental Protection Agency Methods 204, 204A, 204B, 204C, 204D, 204E, and/or 204F; or
 - b. Any other method approved by United States Environmental Protection Agency, the California Air Resources Board, and the Air Pollution Control Officer.
 - 502.5 **DETERMINATION OF VOLUMETRIC FLOWRATE:** Volumetric flowrate shall be determined in accordance with United States Environmental Protection Agency Methods 2, 2A, 2C, or 2D (whichever is applicable).

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