RULE 67.6. SOLVENT CLEANING OPERATIONS

TO BE REPEALED Effective May 23, 2008 (Effective 7/25/79: Rev. Effective 10/16/90)

(a) **APPLICABILITY**

This rule is applicable to all surface cleaning or stripping operations or gas-path cleaners which use solvents for the purpose of removing surface impurities or coatings, and preparing parts or products for painting, plating, repair, inspection, assembly, heat treatment, or for any other use. This rule is also applicable to operations which immerse items in solvent-rich atmospheres for heating or any other purpose, including vapor-phase solder reflow operations.

(b) **EXEMPTIONS**

(1) Cleaning Material

The provisions of Section (d) shall not apply to any solvent cleaner installed, or for which application for an Authority to Construct was received, before September 1, 1980, and which, prior to and since September 1, 1980, has continuously employed exclusively any of the following cleaning materials:

(i) 1,1,1-Trichloroethane

(ii) Trichlorotrifluoroethane

(iii) Methylene Chloride

The provisions of Section (d) shall not apply to any cold solvent cleaner with a liquid surface area less than 5 square feet and vapor solvent cleaner with a vapor-air interface less than 5 square feet installed, or for which application for an Authority to Construct was received before October 16, 1990, and that employ any of the following cleaning materials:

(i) 1,1,1-Trichloroethane

(ii) Trichlorotrifluoroethane

(iii) Methylene Chloride

(2) Wipe Cleaning

The provisions of Section (d) shall not apply to any solvent cleaning operation employing only wipe cleaning.

(3) The provisions of Section (d) shall not apply to any cold solvent cleaner dip tank with a liquid surface area of 1 square foot (0.09 square-meters) or less, or with a capacity of 1 gallon or less.

(4) Operations Subject to Rules 67.9 or 67.11.

The provisions of Section (d) shall not apply to non-immersion stripping or coating equipment cleanup operations subject to the requirements of Rule 67.9 or Rule 67.11.

(5) Dry Cleaning Operations.

The provisions of Section (d) shall not apply to the application of solvent to garments, fabrics, or leather for the purposes of cleaning when such applications are subject to the requirements of Rule 67.2 or Rule 67.8.

(c) **DEFINITIONS**

(1) **"Cold Solvent Cleaner"** means any non-boiling solvent cleaner, excluding conveyorized solvent cleaners, vapor solvent cleaners, and gas-path cleaners, and wipe cleaning operations, and including spray sinks, spray booths, strippers, remote-reservoir cleaners, and dip tanks. Solvent cleaners which employ heated but non-boiling solvents shall be considered cold solvent cleaners.

(2) **"Conveyorized Cold Solvent Cleaner"** means any continuously loaded, solvent cleaner which is not a conveyorized vapor solvent cleaner.

(3) **"Conveyorized Vapor Solvent Cleaner"** means any continuously loaded solvent cleaner which immerses parts in boiling solvent or in solvent vapors generated by boiling solvent. Conveyorized solvent cleaners which contain any vapor solvent cleaning sections shall be considered conveyorized vapor solvent cleaners.

(4) **"Existing Unit"** means, for the purposes of this rule, one which was installed and operating in San Diego County before October 16, 1990.

(5) **"Freeboard Chiller"** means a condenser placed above the primary condenser which provides a blanket of cold air above the vapor-air interface to reduce emissions.

(6) **"Freeboard Height"** means

(i) For cold solvent cleaner dip tanks, the distance from the maximum solvent level line to the top of the tank.

(ii) For open-top vapor solvent cleaners, the distance from the solvent vapor-air interface to the top of the solvent cleaner tank.

(iii) For conveyorized solvent cleaners, the distance from the top of the solvent or solvent vapor-air interface to the bottom of the lowest entrance of the solvent cleaner.

(7) **"Freeboard Ratio"** means the freeboard height divided by the smaller of the interior length or width of the solvent cleaner tank.

(8) **"Gas-Path Cleaner (Corrosion Control Cart)"** means equipment which applies solvent to the interiors of gas turbines or jet engines for removal of corrosion or combustion deposits.

(9) **"Liquid Leak"** means any visible leak of liquid solvent at a rate in excess of three drops per minute.

(10) **"Liquid Surface Area"** means the area of the interface between the liquid solvent available for dipping and the air which is contiguous with the outside of the solvent cleaner. The area of surfaces wetted by the solvent before it drains into a reservoir in a section of the solvent cleaner used for parts drainage and not used for dipping shall not be included in the liquid surface area.

(11) **"Open-top Vapor Solvent Cleaner"** means any batch loaded, vapor solvent cleaner.

(12) **"Organic Compound"** means any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and methane) which might be emitted during use, processing, application, curing, or drying of a solvent or other material.

(13) **"Remote-Reservoir Solvent Cleaner"** means any batch-loaded cold solvent cleaner in which liquid solvent is pumped to a sink-like work area which drains back into a liquid solvent tank, which is completely enclosed except for the drain opening, while parts are being cleaned. For the purposes of this rule any cold solvent cleaner except for wipe stations, dip tanks, and gas-path cleaners shall be considered a remote-reservoir solvent cleaner.

(14) **"Solvent"** means, for the purposes of this rule, any liquid containing more than 10 percent by weight of organic compounds and which is used to dissolve, clean, strip, or remove impurities, coatings, stains, or films from surfaces.

(15) **"Solvent Cleaner"** means a device which applies solvent or in which solvent is applied to items for the purpose of removing or stripping impurities, coatings, stains, or films.

(16) **"Stripper"** means a solvent cleaner in which solvent is applied to a surface for the purpose of removing a film, coating, or stain, including, but not limited to, dip tanks and spray sinks.

(17) **"Stripping"** means applying solvent to remove a coating or film from a surface.

(18) **"Vapor-Air Interface"** means the area of contact between the solvent vapors and air which is contiguous with the air outside the solvent cleaner.

(i) The area of the vapor-air interface shall be calculated as the product of the lengths between internal solvent cleaner walls behind the condensing coils.

(ii) The perimeter of the vapor-air interface shall be calculated as the sum of the lengths of the internal solvent cleaner walls behind the condensing coils.

(19) **"Vapor-Phase Solder Reflow Unit"** means a device in which parts are immersed in an organic compound-rich vapor generated by boiling a liquid for heating to melt or soften solder connections of electronic components. For the purposes of this rule batch-loaded vapor-phase solder reflow units shall be considered open-top vapor solvent cleaners and continuously loaded vapor-phase solder reflow units shall be considered conveyorized vapor solvent cleaners.

(20) **"Vapor Solvent Cleaner"** means a solvent application device in which parts are immersed in an organic compound-rich vapor generated by boiling a liquid for cleaning. For the purposes of this rule vapor-phase solder reflow units shall be considered to be vapor solvent cleaners. For the purposes of this rule solvent cleaners which immerse parts in boiling solvent shall be considered vapor solvent cleaners.

(21) **"Wipe Cleaning"** means that method of cleaning which utilizes a material, such as a rag, wetted with a solvent, coupled with a physical rubbing process to remove contaminants from surfaces.

(d) **STANDARDS AND REQUIREMENTS**

(1) General Equipment Requirements. A person shall not operate a solvent cleaner unless all of the following are used:

(i) A container for the solvent ;

(ii) An apparatus or cover which completely covers the solvent container when not processing work;

(iii) A facility for draining cleaned parts such that drained solvent is returned to the container; and

(iv) A permanent, conspicuous, legible label listing the applicable operating requirements contained in Subsections (d)(5) through (d)(9).

(2) Cold Solvent Cleaner Equipment Requirements. A person shall not operate a cold solvent cleaner unless the requirements of Subsection (d)(1) are met and the following are used:

(i) A cover which is easily operable with one hand or mechanically assisted.

(ii) For dip tanks or dip sections, a readily visible, permanent mark or line indicating the maximum allowable solvent level.

(iii) For dip tanks, a freeboard ratio greater than or equal to 0.5.

(iv) For remote-reservoir cleaners, a solvent with a vapor pressure of organic compounds less than 33 mm Hg at 38°C (0.6 psia at 100°F): This provision does not apply to stripping of wood products with any combination of 1,1,1-trichloroethane or methylene chloride.

(v) For cold solvent cleaners employing sprays, spray nozzles which produce continuous liquid flows, not fine atomized nor shower-type sprays.

(vi) For cold solvent cleaners employing solvent with a vapor pressure of organic compounds greater than 33 mm Hg (0.6 psia) at 38°C (100°F) or employing solvent heated above 50°C (122°F).

(A) an internal drainage device, such that parts are enclosed under the cover of the solvent cleaner while draining; and

(B) a freeboard ratio greater than or equal to 0.75; or

(C) a water cover, provided the solvent is insoluble in and denser than water.

(3) Open-top Vapor Solvent Cleaner and Conveyorized Solvent Cleaner Equipment Requirements: A person shall not operate an open-top vapor solvent cleaner or conveyorized solvent cleaner unless the requirements of Subsection (d)(1) are met and the following are used:

(i) A cover which can be easily operated without disturbing the vapor layer;

(ii) A primary condensing coil situated above the boiling solvent, except for conveyorized cold solvent cleaners;

(iii) All of the following safety devices, except for conveyorized cold solvent cleaners:

(A) a device which shuts off the sump heat if the condenser coolant stops circulating, except for refrigerated condensers;

(B) a device which shuts off the sump heat if the condenser coolant or refrigerant becomes warmer than the designed operating temperature;

(C) a device which shuts off the sump heat if the vapor level rises above the designed operating level and which is only manually resettable; and

(D) for solvent cleaners of the spray type, a device which prevents spray pump operation if the solvent vapor-air interface falls below the designed operating level.

(iv) For solvent cleaners employing sprays:

(A) spray nozzles which produce continuous liquid flows, not fine atomized or shower type sprays; or

(B) sprays which are located below the vapor-air interface.

(v) For open-top vapor solvent cleaners with a vapor-air interface area greater than 1 square meter (10.76 square feet), conveyorized vapor solvent cleaners with an vapor-air interface area greater than 2 square meters (21.52 square feet), and conveyorized cold solvent cleaners with a liquid surface area greater than 2 square meters (21.52 square feet).

(A) an automated cover-elevator system which opens only when the dry part is actually entering or exiting the solvent cleaner, except for conveyorized solvent cleaners; or

(B) a freeboard ratio greater than or equal to 0.75 and a powered cover, except for conveyorized solvent cleaners; or

(C) a refrigerated freeboard chiller having a minimum of 500 BTU per hour cooling capacity per foot along the vapor-air interface perimeter or a refrigerated condenser coil having a minimum cooling capacity of 100 percent of the boiling sump heat input rate; or

(D) a carbon adsorption system with ventilation greater than or equal to 15 cubic meters per minute per square meter (50 cubic feet per minute per square foot) of vapor-air interface area and a control efficiency of 90 percent or more by weight of organic compounds ; or

(E) a control system which has a control efficiency at least as effective as any of the above and which is approved by the Air Pollution Control Officer on an annual basis and meets the requirements of Section (e).

(vi) For all conveyorized solvent cleaners, the following:

(A) a drying tunnel, which is an extension from the exit of the conveyorized solvent cleaner to allow more time for the cleaned parts to drain completely, or other means sufficient to prevent cleaned parts from carrying solvent liquid out of the solvent cleaner, and

(B) minimized openings such that entrances and exits shall silhouette work loads with an average clearance between parts and the edge of the solvent cleaner opening less than 10 centimeters or less than 10 percent of the opening width.

(4) Gas-Path Cleaner (Corrosion Control Cart) Requirements: A person shall not operate a gas-path cleaner unless the requirements of Subsection (d)(1) are met and a solvent with a vapor pressure of organic compounds less than 33 mm Hg at 38°C (0.6 psia at 100°F) and greater than 75 percent water by volume or a vapor pressure of organic compounds less than 1 mm HG at 38°C (0.6 psia at 100°F) and greater than 50 percent water by volume is used.

(5) General Operating Requirements: Any person who operates a solvent cleaner shall conform to the following operating requirements.

(i) The solvent cleaner, ventilation systems, and emission control equipment shall be installed and maintained in proper working order. The ventilation systems and emission control equipment shall be properly operating at all times when parts are being cleaned or solvent is being heated in the solvent cleaner.

(ii) There shall be no liquid solvent leaks from any portion of the degreasing equipment.

(iii) Solvent, including waste solvent and distillation residue, shall not be stored or disposed of in a manner that will cause or allow evaporation into the atmosphere.

(iv) Distillation residues shall not contain more than 10 percent solvent by volume after distillation recovery of waste.

(v) Devices designed to cover the solvent shall not be removed except to process work or to perform maintenance.

(vi) Solvent agitation shall be achieved only by means of pump circulation, mechanical mixing, or with ultrasonics. Gas agitation shall not be used.

(vii) For solvent cleaners employing sprays, except gas-path cleaners, the stream pressure shall be low enough to prevent liquid splashing outside the container.

(viii) No porous or absorbent materials, such as cloth, leather, wood, or rope shall be cleaned with solvent. This provision does not apply to stripping of wood products using solvents which are more than 50% by volume of any combination of 1,1,1-trichloroethane and methylene chloride.

(ix) Solvent cleaner operators shall maintain records of the types, amounts, and dates of solvents added to and removed from each solvent cleaner. The records shall be maintained for three years and made available to the Air Pollution Control Officer immediately upon request.

(6) Cold Solvent Cleaner Operating Requirements: Any person who operates a cold solvent cleaner shall conform to requirements of Subsection (d)(5) and the following:

(i) Cleaned parts shall be drained until dripping ceases.

(ii) The solvent cleaner liquid level shall not be above the marked maximum solvent level line.

(iii) For remote-reservoir cleaners, the cover of the solvent reservoir shall be closed at all times except when the reservoir is being cleaned or repaired, and

(iv) For remote-reservoir cleaners, the portion of the solvent cleaner where parts are cleaned shall not be exposed to drafts greater than 40 meters per minute (131 feet per minute).

(7) Open-top Vapor Solvent Cleaner Operating Requirements: Any person who operates an open-top vapor solvent cleaner shall conform to the requirements of Subsection (d)(5) and the following:

(i) Solvent carry-out shall be minimized by all of the following methods:

(A) racking parts for full drainage;

(B) moving parts in and out of the solvent cleaner at a speed less than 3.3 meters per minute;

(C) cleaning the workload in the vapor zone until condensation ceases;

(D) tipping out any pools of solvent on the cleaned parts before removal; and

(E) not removing parts from the solvent cleaner until visually dry.

(ii) Solvent shall not be sprayed above the vapor-air interface.

(iii) Solvent cleaner exhaust ventilation systems, if used, shall not exceed 20 cubic meters per minute per square meter (65 cubic feet per minute per square foot) of solvent cleaner vapor-air interface area, unless necessary to meet OSHA requirements. Comfort ventilation fans shall not be positioned near the solvent cleaner opening in such a way as to disturb the vapor zone. Lip ventilation, located below the cover of the solvent cleaner, if used, shall be turned off when the solvent cleaner is covered.

(iv) Water shall not be visibly detectable in the organic compound phase exiting the water separator, nor shall organic compounds be visibly detectable in the aqueous phase leaving the separator.

(v) Workloads placed in the solvent cleaner shall have an occupied, horizontal cross-sectional area less than one half of the vapor-air interface area.

(vi) During start up, the primary condenser and refrigerated freeboard chiller, if used, shall be turned on either simultaneously or before the sump heater. During shutdown, the sump heater shall be turned off, either simultaneously or before the condenser coolant and refrigerated freeboard chiller are turned off. The solvent cleaner shall be covered whenever the primary condenser is turned off.

(8) Conveyorized Solvent Cleaner Operating Requirements: Any person who operates a conveyorized solvent cleaner shall conform to the requirements of Subsection (d)(5) above and the following:

(i) Solvent carry-out shall be minimized by the following methods:

(A) racking parts for best drainage;

(B) for conveyorized vapor solvent cleaners, maintaining vertical conveyor speed at less than 3.3 meters (11 feet) per minute; and

(C) for conveyorized cold solvent cleaners, draining parts until dripping ceases.

(ii) Solvent cleaner exhaust ventilation systems shall not exceed 20 cubic meters per minute per square meter (65 cubic feet per minute per square foot) of solvent cleaner open area, unless necessary to meet OSHA requirements. Comfort ventilation fans shall not be positioned near the solvent cleaner opening in such a way as to disturb the vapor zone.

(iii) Water shall not be visibly detectable in the organic compound phase exiting the water separator, nor shall organic compounds be visibly detectable in the aqueous phase leaving the separator.

(iv) During startup, the primary condenser and refrigerated freeboard chiller, if used, shall be turned on either simultaneously or before the sump heater. During shutdown, the sump heater shall be turned off, either simultaneously or before the condenser coolant and refrigerated freeboard chiller are turned off. The solvent cleaner shall be covered whenever the primary condenser is turned off.

(9) Gas-Path Cleaner (Corrosion Control Cart) Operating Requirements: Any person who operates a gas-path cleaner shall conform to the requirements of Subsection (d)(5) and the following:

(i) Cleaned parts shall be drained until dripping ceases.

(ii) The cover of the solvent reservoir shall be closed at all times except when the reservoir is being cleaned or repaired.

(iii) Solvent cleaning operations shall not be conducted in areas with air flows greater than 135 meters per minute (5 miles per hour).

(e) **ALTERNATIVE CONTROL**

(1) The provisions of Section (d) shall not apply if alternative methods which reduce emissions of organic compounds from the solvent cleaning operations by at least 85 percent by weight are employed, such as:

(i) Venting the organic compound emissions from a solvent cleaning operation through an air pollution control device approved by the Air Pollution Control Officer,

(ii) Reducing the emissions of organic compounds from a solvent cleaning operation through the use of low volatility cleaning materials.

When employing low volatility cleaning materials, the reduction shall be determined by comparing the organic compound emissions which occur when employing the low volatility cleaning materials with the organic compound emissions that occur when employing the organic solvent cleaning material that was in use on or before September 1, 1980. Such demonstration shall be done using methods and procedures approved by the Air Pollution Control Officer.

(2) Any person electing to comply by one or more alternative control measures shall first submit a plan to the Air Pollution Control Officer, for approval, showing how compliance will be achieved. Such plan shall include documentation sufficient to identify and characterize the cleaning materials in use on or before September 1, 1980 and shall include a protocol describing how compliance shall be demonstrated. The protocol shall include methods and procedures approved by the Air Pollution Control Officer.

(3) Any person electing to comply by one or more alternative control measures shall first submit an application for authorization to construct and permit to operate or for modified permit to operate to the Air Pollution Control Officer. Such person shall reimburse the District for all District costs incurred in evaluating an alternative compliance demonstration. The District costs shall be determined using the labor rates specified in Rule 40, Schedule 94.

(4) An alternative control measure subject to the provisions of this section shall be submitted as a Source-Specific Revision to the State Implementation Plan (SIP) for Solvent Metal Cleaning by the USEPA. The Air Pollution Control Officer shall not accept a method as equivalent under this Section unless it has been accepted as a Source-Specific SIP Revision.