(Adopted March 6, 2009)(Amended July 9, 2010)(Amended April 3, 2026)

RULE 1144 METALWORKING FLUIDS AND DIRECT-CONTACT LUBRICANTS

(a) Purpose

The purpose of Rule 1144 is to reduce Volatile Organic Compound (VOC) emissions from the use of Metalworking Fluids and Direct-Contact Lubricants at industrial facilities.

(b) Applicability

The rule applies to all persons who use Metalworking Fluids and Direct-Contact Lubricants on products and parts during manufacture and assembly; and all manufacturers and suppliers who supply, sell, or offer for sale Metalworking Fluids and Direct-Contact Lubricants for use at industrial facilities. This rule shall apply to all VOC containing fluids used for metalworking including metal removal, metal forming, metal treating or lubricating operations where the Metalworking Fluid or Direct-Contact Lubricant comes into direct contact with products and parts including, but not limited to, blanking, broaching, coining, cutting, drilling, drawing, forming, forging, grinding, heading, honing, Lapping, marquenching, milling, piercing, quenching, roll forming, rolling, stamping, tapping, threading, turning and wire drawing. The rule also applies to VOC containing fluids used for metal protection, including rust and corrosion prevention and inhibition, during the manufacture and assembly of products and parts.

(c) Definitions

For the purpose of this rule, the following definitions shall apply:

(1) ASSEMBLED AIRCRAFT is any machine that is a complete vehicle, assembly of parts at an aircraft assembly facility or major partial section including wheel wells, fuselage sections, pressure decks, wings, blades or cockpit, designed to travel through the air, without leaving the earth's atmosphere, including airplanes, balloons, dirigibles, helicopters and missiles.

(2) DIRECT-CONTACT LUBRICANT is a fluid that comes into direct contact with the product or part during Manufacturing or assembly and is used to reduce friction and to prolong the life of machine tools and machinery. A Direct-Contact Lubricant is not a Metal Forming Fluid and is not a Metal Removal Fluid.

(c) (3) EXEMPT COMPOUND is as defined in Rule 102 – Definition of Terms.

(4) GRAMS OF VOC PER LITER OF MATERIAL is the weight of VOC per volume of material and can be calculated by the following equation:

$$\text{Grams of VOC per Liter of Material} = \frac{W_s - W_w - W_{es}}{Vm}$$

Where: Ws = Weight of volatile compounds in grams
Ww = Weight of water in grams
Wes = Weight of Exempt Compounds in grams
Vm = Volume of material in liters

(5) LAPPING is a Manufacturing method that employs particles of an abrasive material, suspended in a liquid carrier, between rotating plates.

(6) MANUFACTURING is the use of tools and labor to make things for sale.

(7) METAL FORMING FLUID is a fluid used at the tool and workpiece interface to facilitate the flow of metal over the tool and to extend the life of the tool. Common metal forming operations include, but are not limited to, blanking, coining, drawing, forming, forging, heading, piercing, roll forming, stamping and wire drawing.

(8) METAL PROTECTING FLUID is fluid that inhibits or prevents the corrosion of metal surfaces. It is applied independently of any other metalworking, lubricating or cleaning application.

(9) METAL REMOVAL FLUID is a fluid used at the tool and workpiece interface to facilitate the removal of metal from the part, cool the part and tool, extend the life of the tool, and to flush away chips and debris. Common metal removal operations include, but are not limited to, broaching, cutting, drilling, grinding, honing, Lapping, milling, tapping, threading and turning.

(10) METAL TREATING FLUID is a fluid used to remove heat from metal parts, affect their hardness, and/or change the grain structure of the metal. Common metal treating operations include, but are not limited to, marquenching and quenching.

(11) METALWORKING FLUID is a fluid that facilitates operations involving the working, protecting or modification of metals, including metal forming, protecting, treating and removal, and may consist of straight oils, emulsifiable oils and synthetic and semi-synthetic fluids.

(c) (12) MILITARY SPECIFIED PRESERVATIVE is a preventative or protecting fluid qualified under military specification and used in a military application.

(13) PRECISION METAL REMOVAL FLUID is a fluid used for carbide grinding machine tools, where the manufacturer of the machine tool specifies the viscosity of the fluid, or for machining of aluminum or magnesium in single or multiple spindle automatic machines.

(14) SINKER ELECTRICAL DISCHARGE MACHINING (EDM) is a method of removing material by a series of rapid recurring electric arcing discharges between an electrode and the workpiece, in the presence of an energetic electric field, in an insulating oil.

(15) SPACE VEHICLE is a vehicle designed to travel beyond the earth's atmosphere.

(16) SOLICIT is to require for use or to specify, by written or oral contract.

(17) SUPER COMPLIANT MATERIAL is any material containing 50 grams or less of VOC per liter of material.

(18) VANISHING OIL is a Direct-Contact Lubricant or metalworking fluid with a flash point less than 200°F (93°C).

(19) VOLATILE ORGANIC COMPOUND (VOC) is as defined in Rule 102 – Definition of Terms.

(d) Requirements

(1) VOC Content

(A) A person shall not use or Solicit the use of any Metalworking Fluid or Direct-Contact Lubricant that has a VOC content in excess of the limits contained in Table A of this subparagraph:

Table A – Fluid Categories and VOC Limits

FLUID	VOC g/l (lb/gal)
(A) Vanishing Oil	50 (0.42)
(B) Metalworking Fluid	
(i) Metal Forming	75 (0.63)
(ii) Metal Removal	
(a) General	75 (0.63)
(b) Precision Metal Removal	130 (1.08)
(iii) Metal Treating	75 (0.63)
(iv) Metal Protecting	
(a) General	50 (0.42)
(b) Military Specified Preservative	340 (2.83)
(C) Direct-Contact Lubricant	50 (0.42)

(B) If anywhere on the container of any Metalworking Fluid or Direct-Contact Lubricant; on any sticker or label affixed thereto; or in any sales, advertising, or technical literature, any representation or information indicates the fluid or lubricant may be used, or is suitable for use, in more than one category listed in Table A, then the lowest applicable VOC limit shall apply.

(2) Prohibitions

(A) No person shall manufacture for use, offer for sale, sell, or distribute any Metalworking Fluid or Direct-Contact Lubricant for use in the South Coast Air Quality Management District (South Coast AQMD)

which, at the time of sale or manufacture, contains more VOC per liter of material after recommended dilution as listed in Table A.

(d) (2) (B) No person shall manufacture any Metalworking Fluid or Direct-Contact Lubricant for use within South Coast AQMD containing more than 0.01 percent by weight of *para*-Chlorobenzotrifluoride (pCBtF, Chemical Abstracts Service Registration Number 98-56-6) and/or *tert*-Butyl Acetate (t-BAc, Chemical Abstracts Service Registration Number 540-88-5) after July 1, 2027.

(C) No person shall supply, offer for sale, sell or distribute any Metalworking Fluid or Direct-Contact Lubricant for use within South Coast AQMD containing more than 0.01 percent by weight of pCBtF and/or t-BAc after July 1, 2028.

(D) No person shall use any Metalworking Fluid or Direct-Contact Lubricant within South Coast AQMD containing more than 0.01 percent by weight of pCBtF and/or t-BAc after July 1, 2029.

(E) No person shall use within, or manufacture, supply, offer for sale, sell, or distribute for use within South Coast AQMD any Metalworking Fluid or Direct-Contact Lubricant containing more than 0.01 percent by weight of Group II Exempt Compounds after July 1, 2027.

(e) Control Equipment

A person may use Metalworking Fluids and Direct-Contact Lubricants in excess of the limits, provided all Metalworking Fluids and Direct-Contact Lubricants are controlled by an emission control system that meets the following:

(1) The control device reduces VOC emissions from an emission collection system by at least 95 percent by weight or the output of the air pollution control device is no more than 5 PPM VOC by volume calculated as carbon with no dilution; and

(2) The emission collection system has been demonstrated to collect at least 90 percent by weight of the VOC emissions generated by the sources of VOC emission.

(f) Administrative Requirements

Containers for sale or distribution, of any Metalworking Fluid or Direct-Contact Lubricant subject to this rule shall display the VOC content and either the date of manufacture of the contents or a code indicating the date

of manufacture. The manufacturer or supplier of such fluids shall file with the Executive Officer an explanation of each date code.

(g) Recordkeeping Requirements

(1) An owner or operator shall develop and maintain a VOC listing of all Metalworking Fluids and Direct-Contact Lubricants purchased for use at the facility. The list shall be kept in a format specified by the Executive Officer or in an equivalent format and shall contain the following data:

(A) Name and AQMD facility identification number (if applicable) of the stationary source;

(B) For each Metalworking Fluid and Direct-Contact Lubricant:

(i) Manufacturer, a manufacturer product number, ID, or code that uniquely identifies the VOC-containing fluid, and a fluid category;

(ii) Grams of VOC per Liter of Material;

The VOC Listing shall be updated within seven (7) calendar days from the date of receipt of a new Metalworking Fluid or Direct-Contact Lubricant at the facility.

(2) An owner or operator shall record the following information on a monthly usage log in a format specified by the Executive Officer or in an equivalent format:

(A) Name and AQMD identification number of the facility;

(B) Manufacturer product number, ID, or code from the VOC Listing;

(C) Amount of each VOC-containing fluid purchased on a monthly basis;

(D) Initials of the person entering the data; and

(E) Date the data was entered.

(3) An owner or operator of a stationary source shall maintain and make available to a South Coast AQMD representative upon request all of the information necessary to verify the amount of Metalworking Fluids and Direct-Contact Lubricants used at the facility including, but not limited to purchase records identifying the supplier's name, date, and amount purchased.

(4) In lieu of complying with paragraphs (g)(1), (g)(2) and (g)(3), records may be maintained pursuant to Rule 109 – Recordkeeping for Volatile Organic Compound Emissions, for all applications subject to this rule.

(g) (5) Any person using an emissions control system as a means of complying with this rule shall maintain daily records of all key system parameters, including hours of operation, temperatures, pressures and flow rates, that are necessary to ensure control efficiency requirements.

(h) Test Methods and Procedures

The following test methods and procedures shall be used to determine compliance with this rule. Other applicable test methods may be used if they are determined to be equivalent and approved in writing by the Executive Officer, the California Air Resources Board and the U.S. Environmental Protection Agency.

(1) Determination of VOC Content

(A) ASTM E 1868 - 10 Standard Test Method for Loss-On-Drying by Thermogravimetry. Quality assurance and quality control procedures shall be conducted using South Coast AQMD Additional Requirements to ASTM Standard Test Method E 1868-10 for Metalworking Fluids and Direct-Contact Lubricants. Water content shall be determined by ASTM D 4017 (Standard Test Method for Water in Paints and Paint Materials by Karl Fischer Method) if applicable to the specific sample. The exempt solvent content shall be determined by South Coast AQMD Method 303 (Determination of Exempt Compounds) contained in the South Coast AQMD "Laboratory Methods of Analysis for Enforcement Samples" manual; or,

(B) Exempt Perfluorocarbon Compounds

The following classes of compounds:

cyclic, branched, or linear, completely fluorinated alkanes;

cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

sulfur-containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine,

will be analyzed as Exempt Compounds for compliance with subdivision (d), only when manufacturers specify which individual compounds are used in the coating formulation. In addition, the manufacturers shall identify the U.S. EPA, CARB, and the South

Coast AQMD approved test methods used to quantify the amount of each Exempt Compound.

(h) (2) Determination of Flash Point

ASTM D93 - 07 Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.

(3) Determination of Efficiency of Emission Control System

(A) The capture efficiency of an emission control system shall be determined by verifying the use of a Permanent Total Enclosure (PTE) and 100% capture efficiency as defined by U.S. EPA Method 204 "Criteria for and Verification of a Permanent or Temporary Total Enclosure." Alternatively, if a U.S. EPA Method 204 defined PTE is not employed, capture efficiency shall be determined using a minimum of three sampling runs subject to data quality criteria presented in U.S. EPA technical guidance document "Guidelines for Determination Capture Efficiency, January 9, 1995." Individual capture efficiency test runs subject to the U.S. EPA technical guidelines shall be determined by:

(i) The Temporary Total Enclosure (TTE) approach of U.S. EPA Method 204 through 204F; or

(ii) The South Coast AQMD "Protocol for Determination of Volatile Organic Compounds (VOCs) Capture Efficiency."

(B) The efficiency of the control device and the VOC content measured and calculated as carbon in the control device exhaust gases shall be determined by U.S. EPA's Test Method 18, or California Air Resources Board (CARB) Method 422 for the determination of emissions of Exempt Compounds and U.S. EPA's Test Methods 25, 25A, South Coast AQMD Method 25.1 for the determination of Total Gaseous Non-Methane Organic Emissions as Carbon, or South Coast AQMD Method 25.3 for the determination of Low Concentration Non-Methane Non-Ethane Organic Compound Emissions from Clean Fueled Combustion Sources, as applicable.

(C) The overall efficiency of an emission control system shall be determined using the following equation:

Overall Efficiency

= (Capture Efficiency) x (Control Equipment Efficiency)/100

(i) Exemptions

(1) Paragraph (d)(2) and subdivision (f) shall not apply to Metalworking Fluids and Direct-Contact Lubricants subject to the California Air Resources Board consumer products regulation found in Title 17 of the California Code of Regulations, beginning at Section 94507.

(2) The provisions of this rule shall not apply to Metalworking Fluids and Direct-Contact Lubricants that are expressly and exclusively offered for sale, sold, or manufactured for use outside of the South Coast AQMD or that are for shipment to other manufacturers for reformulation or repackaging.

(3) The provisions of subdivisions (d) and (f) of this rule shall not apply to Metalworking Fluids and Direct-Contact Lubricants subject to VOC limits in other Regulation XI rules.

(4) The provisions of subdivision (d) shall not apply to the following operations:

(A) Lapping;

(B) Sinker EDM;

(C) Avionics and Assembled Aircraft;

(D) Space Vehicle components; and

(E) Fluids utilizing the control device option in subdivision (e).

(5) The provisions of subdivision (g) shall not apply to any Super Compliant Material(s). This exemption shall only apply to facilities that demonstrate that total permitted and non-permitted facility VOC emissions do not exceed 4 tons in any calendar year, including emissions from the Super Compliant Material, as shown by annual purchase records.

(6) Paragraph (d)(2) shall not apply to any manufacturer or supplier of Metalworking Fluid or Direct-Contact Lubricant provided the product was sold to an independent distributor that was informed in writing by the manufacturer or supplier that the Metalworking Fluid or Direct-Contact Lubricant is not to be used in the South Coast AQMD. Manufacturers utilizing this provision shall maintain notification letters for five (5) years, which shall be made available to the Executive Officer or designee upon request.

(7) Subparagraph (d)(2)(A) shall not apply to any manufacturer or supplier of Metalworking Fluid or Direct-Contact Lubricant collected and directed to an emission control system pursuant to subdivision (e).

(i) (8) The provisions of this rule shall not apply to repair, maintenance, or research operations.