

BOARD MEETING DATE: March 1, 2013

AGENDA NO. 28

PROPOSAL: Amend Rule 102 – Definition of Terms

SYNOPSIS: The proposed amendment would exempt two compounds from the VOC definition of the rule. The U.S. EPA has already exempted these compounds from the federal VOC definition because of their negligible photochemical reactivity levels.

COMMITTEE: Stationary Source, January 18, 2013, Reviewed

RECOMMENDED ACTIONS:

Adopt the attached resolution:

1. Certifying the Notice of Exemption for PAR 102 – Definition of Terms; and
2. Amending Rule 102 – Definition of Terms

Barry R. Wallerstein, D.Env.
Executive Officer

EC:LT:NB:DD:RC

Background

The U.S. EPA delisted the compounds 1,1,1,2,3,3,3-heptafluoropropane (commonly known as HFC-227ea) and trans-1,3,3,3-tetrafluoropropene (also known as HFO-1234ze) from the federal VOC definition on the basis that these compounds have negligible contribution to the formation of tropospheric ozone. Earlier this year, the 3M Company and Honeywell Specialty Materials petitioned the SCAQMD to exempt HFC-227ea and HFO-1234ze, respectively, as VOC-exempt compounds in Rule 102 – Definition of Terms. Both compounds do not have toxicity concerns, and are not listed as hazardous air pollutants under the federal Clean Air Act.

HFC-227ea is expected to replace chlorofluorocarbon (CFC) propellants widely used in metered-dose inhalers (MDIs) for treatment of asthma and chronic obstructive pulmonary disease. HFC-227ea is approved by the Food and Drug Administration (FDA) as a suitable replacement for CFC propellants in MDIs. The FDA's approval of HFC-227ea in an inhaler mitigates any toxicity concerns.

Additionally, HFC-227ea has good fire-suppressing characteristics, and it is already being used as a fire extinguishing agent for total flooding fire suppression systems for protecting high-value assets such as computers, data control centers, telecommunication facilities, and museum holdings. Because HFC-227ea is not considered an ozone depleting substance and has a relatively low global warming potential (GWP) compared to Halon 1301, it is listed as an acceptable replacement for Halon 1301 in the U.S. EPA's Significant New Alternatives Policy (SNAP) program.

Similarly, HFO-1234ze has zero ozone depleting potential and an ultra-low GWP, making it a good alternative to high-GWP and/or VOC gases used as foam blowing agents and aerosol propellants. Extensive toxicological studies conducted on the compound indicate it is low in toxicity.

Public Process

During the development of Proposed Amended Rule 102 (PAR 102), staff worked with industry and other persons affected by the proposed amendment. A public workshop was held on December 12, 2012. Comments received during the public workshop, including staff's responses, are summarized in the Final Staff Report.

Proposal

Based on a favorable review of relevant documents pertaining to these two compounds, staff is now proposing to add HFC-227ea and HFO-1234ze to the list of VOC exempt compounds in the rule, under the classification of Group I compounds. Staff estimates that PAR 102 may potentially reduce about 83 tons per year of VOC emissions from foam manufacturing operations, with additional potential VOC reductions for consumer products in aerosol form.

HFC-227ea is expected to replace CFCs as propellants in MDIs. Since these CFCs are considered VOC-exempt compounds, no VOC emission reduction is expected from this product replacement. However, the use of HFC-227ea as replacement for CFC propellants is anticipated to reduce greenhouse gas emissions.

California Environmental Quality Act

Pursuant to the California Environmental Quality Act (CEQA), the SCAQMD is the Lead Agency and has reviewed the proposed project pursuant to the CEQA Guidelines §15002 (k)(1) and §15061. Because the proposed project does not impose new requirements that will create any significant adverse effects on air quality or any other environmental areas, it can be seen with certainty that there is no possibility that the proposed project has the potential to have significant adverse effects on the environment.

Since it can be seen with certainty that the proposed project has no potential to adversely affect air quality or any other environmental area, it is exempt from CEQA pursuant to CEQA Guidelines §15061(b)(3). The Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties immediately following the adoption of the proposed project.

Cost Impacts

Staff does not anticipate any additional cost to users of the compounds proposed for exemption since the use of these compounds is voluntary. Furthermore, PAR 102 would result in savings to the affected facilities due to lower emission fees; therefore, PAR 102 would not have any adverse socioeconomic impacts.

AQMP and Legal Mandates

The California Health and Safety Code requires the SCAQMD to adopt an Air Quality Management Plan to meet state and federal ambient air quality standards in the Basin. In addition, the California Health and Safety Code requires that the SCAQMD adopt rules and regulations that carry out the objectives of the AQMP.

The proposed amendment to Rule 102 helps reduce VOC emissions by providing additional options in meeting SCAQMD’s VOC limits, and supports SCAQMD’s air quality objective of achieving state and federal air quality standards.

Implementation and Resources

Current SCAQMD resources are sufficient to implement the proposed amendments with no additional fiscal impact.

Attachments

- A. Summary of Proposal
- B. Rule Development Process
- C. Key Contacts
- D. Resolution
- E. Proposed Amended Rule 102 Language
- F. Final Staff Report
- G. Notice of Exemption

ATTACHMENT A

SUMMARY OF PROPOSAL

PROPOSED AMENDED RULE 102 – DEFINITION OF TERMS

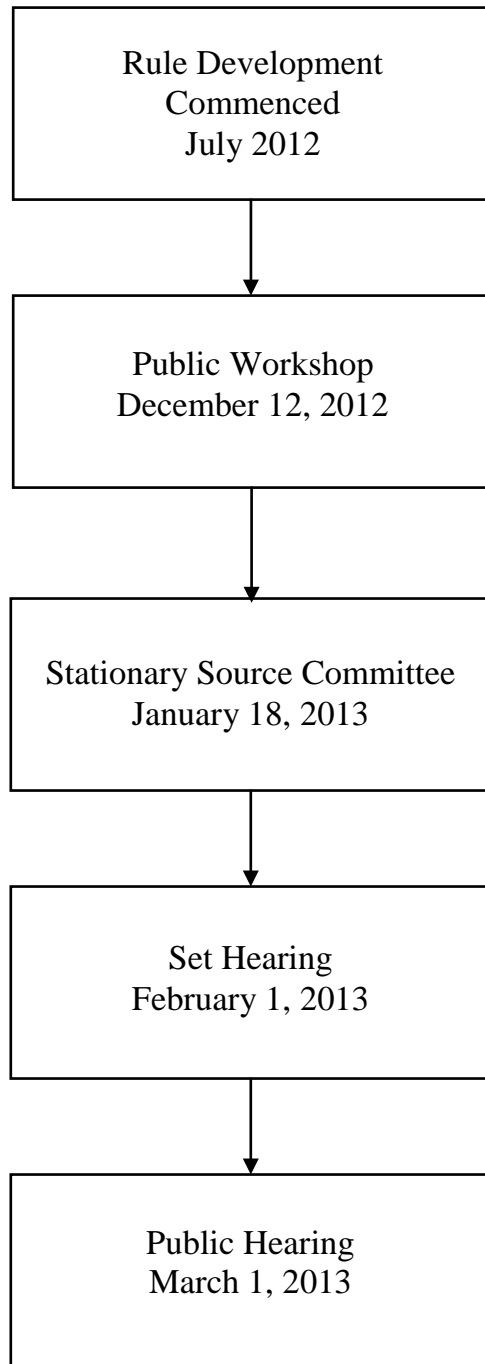
The proposed change to the rule is as follows:

- Add the compounds 1,1,1,2,3,3,3,-heptafluoropropane (HFC-227ea) and trans-1,3,3,3-tetrafluoropropene (HFO-1234ze) to the list of Group I exempt compounds

ATTACHMENT B

RULE DEVELOPMENT PROCESS

Proposed Amended Rule 102 – Definition of Terms



Total Time Spent In Rule Development Pre-Board Hearing: 8 Months

ATTACHMENT C
KEY CONTACTS LIST

The 3M Company
Honeywell Specialty Materials
Raymond Regulatory Resources (3R), LLC
Clemons Concrete Coatings

ATTACHMENT D

RESOLUTION NO. 13 -

A Resolution of the South Coast Air Quality Management District (SCAQMD) Governing Board certifying the Notice of Exemption for the proposed amendments to Rule 102 – Definition of Terms.

A Resolution of the SCAQMD Governing Board amending Rule 102 – Definition of Terms.

WHEREAS, the SCAQMD Governing Board finds and determines that the proposed amendments to Rule 102 are considered a "project" pursuant to the California Environmental Quality Act (CEQA); however, SCAQMD staff reviewed the proposed project and because it can be seen with certainty that there is no possibility that the proposed project in question has the potential to have a significant adverse effect on the environment, it was determined that the proposed project is exempt from CEQA pursuant to CEQA Guidelines §15061(b)(3) – Review for Exemption; and

WHEREAS, the SCAQMD has had its regulatory program certified pursuant to Public Resources Code Section 21080.5 and has conducted CEQA review and analysis pursuant to such program (Rule 110); and

WHEREAS, SCAQMD staff has prepared a Notice of Exemption for Rule 102, as proposed to be amended, that is completed in compliance with CEQA Guidelines §15002(k)(1) – Three Step Process, and §15061 – Notice of Exemption; and

WHEREAS, the SCAQMD Governing Board has determined that a need exists to amend Rule 102 – Definition of Terms in order to incorporate new compounds delisted by U.S. EPA from the federal VOC definition; and

WHEREAS, the SCAQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from California Health and Safety (H&S) Code §§39002, 40000, 40001, 40440, 40441, 40702, 41508, and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 102 – Definition of Terms is written and displayed so that the meaning can be easily understood by persons directly affected by it; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 102 – Definition of Terms, as proposed to be amended, is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 102 – Definition of Terms, as proposed to be amended, does not impose the same requirements as any existing state or federal regulation, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD; and

WHEREAS, the SCAQMD Governing Board in adopting this regulation, references the following statutes which the SCAQMD hereby implements, interprets or makes specific: California H & S Code §§40001, 40440, and 40702; and

WHEREAS, the SCAQMD Governing Board has determined that Proposed Amended Rule 102 – Definition of Terms will not result in increased costs to affected industries and therefore will not result in any adverse socioeconomic impact; and

WHEREAS, a public hearing has been properly noticed in accordance with all provisions of California H & S Code §40725; and

WHEREAS, the SCAQMD Governing Board has held a public hearing in accordance with all provisions of law; and

WHEREAS, the SCAQMD specifies the Manager of the Area Sources unit as the custodian of the Rule 102 documents or other materials which constitute the record of proceedings upon which the adoption of this proposed amendment is based, which are located at the South Coast Air Quality Management District, 21865 Copley Drive, Diamond Bar, California; and

NOW, THEREFORE, BE IT RESOLVED that the SCAQMD Governing Board hereby certifies, pursuant to the authority granted by law, the Notice of Exemption for Proposed Amended Rule 102 – Definition of Terms.

BE IT FURTHER RESOLVED that the SCAQMD Governing Board hereby amends, pursuant to the authority granted by law, Rule 102 – Definition of Terms, as set forth in the attached, and incorporated herein by this reference.

Attachment

DATE: _____

CLERK OF THE BOARDS

ATTACHMENT E

(Adopted February 4, 1977)(Amended April 1, 1977)(Amended September 2, 1977)
(Amended November 4, 1988)(Amended July 9, 1993)(Amended November 17, 1995)
(Amended June 13, 1997) (Amended March 13, 1998)(Amended June 12, 1998)
(Amended April 9, 1999)(Amended October 19, 2001)(Amended December 3, 2004)
(Amended September 11, 2009)(Amended March 1, 2013)

PROPOSED AMENDED RULE 102. DEFINITION OF TERMS

Except as otherwise specifically provided in these rules and except where the context otherwise indicates, words used in these rules are used in exactly the same sense as the same words are used in Division 26 of the Health and Safety Code.

AGRICULTURAL BURNING means open outdoor fires used in agricultural operations in the growing of crops or raising of fowl or animals, or open outdoor fires used in forest management, range improvement, or the improvement of land for wildlife and game habitat or disease and pest prevention. Agricultural burning also includes open outdoor fires used in the operation or maintenance of a system for the delivery of water for the purposes specified above.

AGRICULTURAL OPERATIONS means any operation occurring on a ranch or farm directly related to the growing of crops, or raising of fowl or animals for the primary purpose of making a profit or for a livelihood.

AGRICULTURAL PERMIT UNIT means any article, machine, equipment or other contrivance or combination thereof operated at an agricultural source, which is an agricultural operation and may cause or control the emissions of air contaminants that is not exempt from permit. In addition, each of the following at an agricultural source shall be considered a single agricultural permit unit:

- (A) All confined animal facilities, except that portion that is conveyORIZED feed storage and distribution.
- (B) All conveyORIZED feed storage and distribution at confined animal facilities.
- (C) All orchard wind machines powered by an internal combustion engine with a manufacturer's rating greater than 50 brake horsepower, and operated more than 30 hours in a calendar year.

AGRICULTURAL SOURCE means a source of air pollution or a group of sources used in the production of crops, or the raising of fowl or animals located on

contiguous property under common ownership or control that meets any of the following criteria:

- (A) Is a confined animal facility.
- (B) Is a stationary or portable internal combustion engine used in the production of crops or the raising of fowl or animals except an engine that is used to propel implements of husbandry, as that term is defined in Section 36000 of the Vehicle Code, as that section existed on January 1, 2003.
- (C) Is a stationary source required by federal law to be included in an operating permit program established pursuant to Title V of the Federal Clean Air Act (42 U.S.C. Sec. 7661 to 7661f, incl.) and the federal regulation adopted pursuant to Title V, or is a source that is otherwise subject to regulation by a district pursuant to this division or the Federal Clean Air Act (42 U.S.C. Sec. 7401 et seq.)

AGRICULTURAL WASTES means unwanted or unsalable materials produced wholly from agricultural operations, other than forest or range management operations, directly related to the growing of crops or animals for the primary purpose of making a profit or for a livelihood. The term does not include wastes created by land use conversion to non-agricultural purposes unless the destruction of such waste by open outdoor fire is ordered by the County or State Agricultural Commissioner upon his determination that the waste is infested with infections transmittable or contagious plant disease which is an immediate hazard to agricultural operations conducted on adjoining or nearby property.

AIR POLLUTION CONTROL OFFICER means the Executive Officer, or designee of the South Coast Air Quality Management District.

AIR CONTAMINANT or air pollutant means any discharge, release, or other propagation into the atmosphere directly or indirectly caused by man and includes, but is not limited to, smoke, charred paper, dust, soot, grime, carbon, fumes, gases, odors, particulate matters, acids or any combination thereof.

ATMOSPHERE (This definition was adopted on November 16, 1954 for the Metropolitan Zone and on November 23, 1973 for the Southern Zone. It is currently applicable only to the Metropolitan and Southern Zones.) "Atmosphere" means the air that envelopes or surrounds the earth. Where air pollutants are emitted into a building not

designed specifically as a piece of air pollution control equipment, such emission into the building shall be considered an emission into the atmosphere.

BASIC EQUIPMENT means any article, machine, equipment or contrivance which causes the issuance of air contaminants.

BREAKDOWN means a condition caused by an accidental fire or non-preventable mechanical or electrical failure.

CLEAN AIR SOLVENT is a VOC-containing material used to perform solvent cleaning, solvent finishing, or surface preparation operations or activities which:

- (A) Contains no more than twenty-five (25) grams of VOC per liter of material, as applied;
- (B) Has a VOC composite partial vapor pressure less than 5 mm Hg at 20°C (68°F);
- (C) Reacts to form ozone at a rate not exceeding that of toluene;
- (D) Contains no compounds classified as Hazardous Air Pollutants (HAPs) by the Federal Clean Air Act, or Ozone Depleting Compounds (ODCs) and Global Warming Compounds (GWCs) as defined by the District; and
- (E) Has been certified by the District to meet the criteria stated in (A) through (D) according to test methods and procedures approved by the District.

CLEAN AIR SOLVENT CERTIFICATE is a certificate issued by the District to a manufacturer, distributor, or facility for a specified product or class of products that meets the criteria for a Clean Air Solvent.

A Clean Air Solvent Certificate shall be valid for five years from the date of issuance, unless some lesser time is designated and written notification is given by the Executive Officer, and shall be renewed upon the Executive Officer's determination that the product(s) continues to meet the criteria for a Clean Air Solvent. However, the Executive Officer may revoke such Certificate if it is determined that the specific product or class of products does not meet the requirements of Clean Air Solvents as defined at the time of issuance.

COMBUSTIBLE REFUSE means any solid or liquid combustible waste material containing carbon in a free or combined state.

COMBUSTION CONTAMINANTS are particulate matter discharged into the atmosphere from the burning of any kind of material containing carbon in a free or combined state.

COMPLIANCE SCHEDULE means the date or dates by which a source or category of sources is required to comply with specific emission limitations contained in any air pollution rule, regulation, or statute and with any increment of progress toward such compliance.

CONFINED ANIMAL FACILITY (CAF) means a source or group of sources of air pollution at an agricultural source for the raising of 3,360 or more fowl or 50 or more animals, including but not limited to, any structure, building, installation, farm, corral, coop, feed storage area, milking parlor, or system for the collection, storage, or distribution of solid and liquid manure; if domesticated animals, including but not limited to, cattle, calves, horses, sheep, goats, swine, rabbits, chickens, turkeys, or ducks corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.

CONTROL EQUIPMENT means air pollution control equipment which eliminates, reduces or controls the issuance of air contaminants.

DISTRICT means the South Coast Air Quality Management District.

DUSTS are minute solid particles released into the air by natural forces or by mechanical processes including, but not limited to, crushing, grinding, milling, drilling, demolishing, shoveling, conveying, covering, bagging, and sweeping.

EXECUTIVE OFFICER means the Executive Officer or designee of the South Coast Air Quality Management District.

EQUIPMENT means any article, machine, or other contrivance.

EXEMPT Compounds are any of the following compounds

(A) Group I

1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee)

1,3-dichloro-1,1,2,2,3-pentafluoropropane (HCFC 225cb)

3,3-dichloro-1,1,1,2,2-pentafluoropropane (HCFC 225ca)

(A) Group I (cont.)

acetone

ethane

chlorodifluoromethane (HCFC-22)

trifluoromethane (HFC-23)

2,2-dichloro-1,1,1-trifluoroethane (HCFC-123)

2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124)

pentafluoroethane (HFC-125)

1,1,2,2-tetrafluoroethane (HFC-134)

1,1,1,2-tetrafluoroethane (HFC-134a)

1,1-dichloro-1-fluoroethane (HCFC-141b)

1-chloro-1,1-difluoroethane (HCFC-142b)

1,1,1-trifluoroethane (HFC-143a)

1,1-difluoroethane (HFC-152a)

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

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

difluoromethane (HFC-32)

1,1,1,2,2,3,3,4,4-nonafluoro-4-methoxy-butane (C₄F₉OCH₃)

2-(difluoromethoxymethyl)-1,1,1,2,3,3,3-heptafluoropropane
[(CF₃)₂CFCF₂OCH₃]

1-ethoxy-1,1,2,2,3,3,4,4,4-nonafluorobutane (C₄F₉OC₂H₅)

2-(ethoxydifluoromethyl)-1,1,1,2,3,3,3-heptafluoropropane
[(CF₃)₂CFCF₂OC₂H₅]

parachlorobenzotrifluoride (PCBTF)

methyl acetate

methyl formate

propylene carbonate

1,1,1,2,3,3,3-heptafluoropropane (HFC-227ea)

trans-1,3,3,3-tetrafluoropropene (HFO-1234ze)

(B) Group II

methylene chloride (dichloromethane)

1,1,1-trichloroethane (methyl chloroform)

trichlorofluoromethane (CFC-11)

dichlorodifluoromethane (CFC-12)

1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113)

1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114)

chloropentafluoroethane (CFC-115)

cyclic, branched, or linear, completely methylated siloxanes
(VMS)

tetrachloroethylene (perchloroethylene)

ethylfluoride (HFC-161)

1,1,1,3,3,3-hexafluoropropane (HFC-236fa)

1,1,2,2,3-pentafluoropropane (HFC-245ca)

1,1,2,3,3-pentafluoropropane (HFC-245ea)

1,1,1,2,3-pentafluoropropane (HFC-245eb)

1,1,1,3,3-pentafluoropropane (HFC-245fa)

1,1,1,2,3,3-hexafluoropropane (HFC-236ea)

1,1,1,3,3-pentafluorobutane (HFC-365mfc)

chlorofluoromethane (HCFC-31)

1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a)

1 chloro-1-fluoroethane (HCFC-151a)

The use of Group II compounds and/or carbon tetrachloride may be restricted in the future because they are either toxic, potentially toxic, upper-atmosphere ozone depleters, or cause other environmental impacts. By January 1, 1996, chlorofluorocarbons (CFC), 1,1,1-trichloroethane (methyl chloroform), and carbon tetrachloride were phased out in accordance with the Code of Federal Regulation Title 40, Part 82 (December 10, 1993).

Whenever there is a conflict between the definition of exempt compounds of VOCs in this rule and the definition of exempt compounds of VOCs in another District rule, the definition in Rule 102 shall apply.

FLEET VEHICLES means gasoline-powered motor vehicles as defined by Section 415 of the Vehicle Code and which are operated from one business address.

FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man.

GASOLINE means any petroleum distillate having a Reid vapor pressure of 200 mm Hg (3.9 pounds per square inch), or greater.

HAZARDOUS AIR POLLUTANT means any air pollutant listed as such by the United States Environmental Protection Agency in accordance with Section 112(b)(1) of the Federal Clean Air Act (42 U.S.C. Sec. 7412(b)(1)).

HEARING BOARD means the Hearing Board of the South Coast Air Quality Management District.

INCREMENTS OF PROGRESS means steps to be taken by an owner or operator to bring a source of air contaminants into compliance. (See definition of "Schedule of Increments of Progress.")

LOADING FACILITY means any aggregation or combination of organic liquid loading equipment which is both possessed by one person, and located so that all the organic liquid loading outlets, for such aggregation or combination of loading equipment can be encompassed within any circle of 90 meters (295 feet) in diameter.

MOTOR VEHICLE is a vehicle which is self-propelled.

MULTIPLE-CHAMBER INCINERATOR means any equipment, structure or part of a structure, used to dispose of combustible refuse by burning, consisting of three or more refractory lined combustion chambers, physically separated by refractory walls, interconnected by gas passage ports or ducts.

OIL-EFFLUENT WATER SEPARATOR means any tank, box, sump or other container in which any petroleum or product thereof, floating on or entrained or contained

in water entering such tank, box, sump, or other container, is physically separated and removed from such water prior to outfall, drainage, or recovery of such water.

ORCHARD HEATER or citrus grove heater means any equipment burning any type of fuel or material capable of being used, for the purpose of giving protection from frost damage that is approved by the California Air Resources Board to produce no more than one gram of unconsumed solid carbonaceous material. Equipment commonly known as Wind Machines are not included.

ORCHARD WIND MACHINE means an internal combustion engine powered fan used in orchards or in citrus groves exclusively for the purpose of giving protection from frost damage.

ORGANIC MATERIAL means a chemical compound of carbon excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, metallic carbonates and ammonium carbonate.

ORGANIC SOLVENTS include diluents and thinners and are defined as organic materials which are liquids at standard conditions and which are used as solvers, viscosity reducers or cleaning agents, except that such material exhibiting a boiling point higher than 104°C (219°F) at 0.5 mm Hg absolute pressure or having an equivalent vapor pressure shall not be considered to be solvents unless exposed to temperatures exceeding 104°C (219°F).

OZONE-DEPLETING COMPOUNDS (ODCs) are Class I substances identified in 40 CFR, Part 82, Appendix A, Subpart A, including, but not limited to the following compounds:

- 1,1,1-trichloroethane (methyl chloroform)
- trichlorofluoromethane (CFC-11)
- dichlorodifluoromethane (CFC-12)
- 1,1,2-trichloro-1,2,2,-trifluoroethane (CFC-113)
- 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114)
- chloropentafluoroethane (CFC-115)

PARTICULATE MATTER means any material, except uncombined water, which exists in a finely divided form as a liquid or solid at standard conditions.

PPM means parts per million by volume.

PERSON means any individual, firm, association, organization, partnership, business trust, corporation, company, contractor, supplier, installer, user or owner, or any state or local governmental agency or public district or any other officer or employee thereof. PERSON also means the United States or its agencies to the extent authorized by Federal law.

PHOTOCHEMICALLY REACTIVE SOLVENT means any solvent with an aggregate of more than 20 percent of its total volume composed of the chemical compounds classified below or which exceeds any of the following individual percentage composition limitations, referred to the total volume of solvent:

- (A) A combination of hydrocarbons, alcohols, aldehydes, ethers, esters or ketones having an olefinic or cycloolefinic type of unsaturation except perchloroethylene: 5 percent;
- (B) A combination of aromatic compounds with eight or more carbon atoms to the molecule except ethylbenzene, methyl benzoate and phenyl acetate: 8 percent;
- (C) A combination of ethylbenzene, ketones having branched hydrocarbon structures, trichloroethylene or toluene: 20 percent.

Whenever any organic solvent or any constituent of an organic solvent may be classified from its chemical structure into more than one of the above groups of organic compounds, it shall be considered as a member of the most reactive chemical group, that is, that group having the least allowable percent of the total volume of solvents.

PM-10 means the particulate matter with an aerodynamic diameter smaller than or equal to 10 microns as measured by applicable State and Federal reference test methods.

PROCESS WEIGHT means the total weight of all materials introduced into any specific process which may discharge contaminants into the atmosphere. Solid fuels charged will be considered as part of the process weight, but liquid gaseous fuels and air will not.

PROCESS WEIGHT PER HOUR means the total process weight divided by the number of hours in one complete operation from the beginning of any given process to the completion thereof, excluding any time during which the equipment is idle.

RECEPTOR AREA means that specified geographic area in which the air contaminants emitted from a source area are present or to which they may be transported.

REDUCTION OF ANIMAL MATTER means any heated process, used for rendering, cooking, drying, dehydrating, digesting, evaporating and protein concentrating of animal matter.

REGULATION means one of the major subdivisions of the Rules of the South Coast Air Quality Management District.

RULE means a rule of the South Coast Air Quality Management District.

SCHEDULE OF INCREMENTS OF PROGRESS means a statement of dates when various steps are to be taken to bring a source of air contaminants into compliance with emission standards and shall include, to the extent feasible, the following:

- (A) The dates of submittal of the final plan for the control of emissions of air contaminants from that source to the District.
- (B) The date by which contracts for emission control systems or process modifications will be awarded, or the date by which orders will be issued for the purchase of component parts to accomplish emission control or process modification.
- (C) The date of initiation of on-site construction or installation of emission control equipment or process change.
- (D) The date by which on-site construction or installation of emission control equipment or process modification is to be completed.
- (E) The date by which final compliance is to be achieved.
- (F) Such other dates by which other appropriate and necessary steps shall be taken to permit close and effective supervision of progress toward timely compliance.

SMALL BUSINESS means a business which is independently owned and operated and meets the following criteria, or if affiliated with another concern, the combined activities of both concerns shall meet these criteria:

- (A) the number of employees is 10 or less; and
- (B) the total gross annual receipts are \$500,000 or less; or
- (C) not-for-profit training center.

For the purpose of qualifying for assistance offered by the District's Small Business Assistance Office only, a small business means a business with total gross annual receipts of \$5,000,000 or less, or a business with a total number of employees of 100 or less.

SOLID PARTICULATE MATTER means particulate matter which exists as a solid at standard conditions.

SOURCE AREA means that specified geographic area in which air contaminants are emitted.

STANDARD CONDITIONS are a gas temperature of 60°F and a gas pressure of 760 mm Hg (14.7 pounds per square inch) absolute.

SUBMERGED FILL PIPE means any fill pipe the discharge opening of which is completely submerged when the liquid level is 15 centimeters (6 inches) above the bottom of the container; or when applied to a container which is loaded from the side, it means any fill pipe the opening of which is entirely submerged when the liquid level is 45 centimeters (18 inches) above the bottom of the container.

VEHICLE is a device by which any person or property may be propelled, moved, or drawn upon a highway, excepting a device moved by human power or used exclusively upon stationary rails or tracks.

VOLATILE ORGANIC COMPOUND (VOC) is any volatile compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.

ATTACHMENT F

| |
|--|
| SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT |
|--|

**Final Staff Report for
Proposed Amended Rule 102 - Definition of Terms**

**Deputy Executive Officer
Planning, Rule Development, & Area Sources**
Elaine Chang, DrPH

**Assistant Deputy Executive Officer
Planning, Rule Development, & Area Sources**
Laki Tisopulos, Ph.D., P.E.

**Manager
Planning, Rule Development, & Area Sources**
Naveen Berry

February 2013

Author: Rizaldy Calungcagin - Air Quality Specialist
Sue Lieu, Ph.D. – Program Supervisor

Reviewed by: David De Boer, Program Supervisor
Lauren Nevitt, Deputy District Counsel II

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
GOVERNING BOARD**

Chairman: DR. WILLIAM A. BURKE
Speaker of the Assembly Appointee

Vice Chairman: DENNIS YATES
Mayor, Chino
Cities of San Bernardino

MEMBERS:

MICHAEL D. ANTONOVICH
Supervisor, Fifth District
County of Los Angeles

JOHN J. BENOIT
Supervisor, Fourth District
County of Riverside

MICHAEL A. CACCIOTTI
Councilmember, South Pasadena
Cities of Los Angeles County/Eastern Region

JOSIE GONZALES
Supervisor, Fifth District
County of San Bernardino

JOSEPH K. LYOU, Ph.D.
Governor's Appointee

JUDITH MITCHELL
Mayor Pro Tem, Rolling Hills Estates
Cities of Los Angeles County/Western Region

SHAWN NELSON
Supervisor, Fourth District
County of Orange

DR. CLARK E. PARKER, SR.
Senate Rules Appointee

JAN PERRY
Councilmember, 9th District
City of Los Angeles Representative

MIGUEL A. PULIDO
Mayor, Santa Ana
Cities of Orange County

VACANT
Cities of Riverside County

EXECUTIVE OFFICER:

BARRY R. WALLERSTEIN, D.Env.

TABLE OF CONTENTS

| | page |
|---|------|
| Executive Summary | 1 |
| Background | 1 |
| Description of Proposed Compounds | 2 |
| Legislative Authority | 6 |
| Proposed Rule Amendments | 7 |
| Emissions Inventory | 7 |
| Cost Impact | 7 |
| Incremental Cost-Effectiveness | 8 |
| California Environmental Quality Act (CEQA) | 8 |
| Comparative Analysis | 8 |
| Draft Findings | 9 |
| Public Comments and Responses | 9 |
| References | 10 |

EXECUTIVE SUMMARY

The United States Environmental Protection Agency (U.S. EPA) excluded the compounds 1,1,1,2,3,3,3,-heptafluoropropane (commonly known as HFC-227ea) and trans-1,3,3,3-tetrafluoropropene (also known as HFO-1234ze) from the federal volatile organic compound (VOC) definition on the basis that these compounds have negligible contribution to the formation of tropospheric ozone. HFC-227ea was delisted by U.S. EPA as a VOC effective December 29, 2004, while HFO-1234ze became VOC-exempt on July 23, 2012.

These compounds have low or minimal toxicity, and are not listed as hazardous air pollutants under the federal Clean Air Act. HFC-227ea is approved by the Food and Drug Administration (FDA) as a propellant used in metered-dose inhalers (MDIs) for treatment of asthma and chronic obstructive pulmonary disease (COPD). HFC-227ea is expected to replace currently used chlorofluorocarbon (CFC) propellants. Additionally, HFC-227ea has fire-suppressing characteristics. HFC-227ea is not considered an ozone depleting substance (ODS) and has a relatively low global warming potential (GWP) compared to Halon 1301, an ODS, previously used in fire suppression systems. Furthermore, FDA's approval of HFC-227ea in an inhaler mitigates any toxicity concerns.

Similarly, HFO-1234ze has zero ozone depleting potential (ODP) and an ultra low GWP, making it a good alternative to high-GWP and/or VOC gases used as foam blowing agents and aerosol propellants. Extensive toxicological studies conducted on the compound indicate it is low in toxicity.

Earlier this year, the 3M Company (3M) and Honeywell Specialty Materials (Honeywell) petitioned the SCAQMD to exempt HFC-227ea and HFO-1234ze, respectively, as VOC exempt compounds in Rule 102 – Definition of Terms. Based on a favorable review of relevant documents pertaining to these two compounds, staff is now proposing to add HFC-227ea and HFO-1234ze to the list of VOC exempt compounds in the rule, under the classification of Group I compounds. Staff estimates that PAR 102 may potentially reduce about 83 tons per year of VOC emissions from foam manufacturing operations, and may further reduce flammability risks associated with currently used foam-blowing agents. Additionally, the potential use of HFO-1234ze as a substitute for hydrocarbon propellants may result in VOC reductions from consumer products in aerosol form.

BACKGROUND

The U.S. EPA lists chemical compounds that are excluded from the VOC definition based on the compound's negligible contribution to the formation of tropospheric ozone (commonly known as smog). Smog is formed when VOCs react photochemically with nitrogen oxides in the atmosphere. However, VOCs have different reactivity levels, i.e., they do not react to form ozone at the same rate or do not form ozone to the same extent. There are VOCs that react slowly, and changes in their emissions have limited effects on local or regional ozone pollution episodes. Because of this, the U.S. EPA's policy has been to exclude organic compounds with negligible reactivity level from the regulatory definition of VOCs, which helps states focus emission control efforts on VOCs that significantly increase ozone concentrations.

In determining negligible reactivity, the U.S. EPA compares the reactivity of a given organic compound to that of ethane. Compounds with reactivity levels lower than, or equal to, ethane under the assumed conditions may be deemed negligibly reactive, while compounds that are

more reactive than ethane continue to be considered reactive VOCs, and therefore subject to control requirements.

Three primary methods are used by the U.S. EPA when comparing reactivity of a specific compound to that of ethane. The first method is based on the reaction rate constant (k_{OH}) of the compound with the hydroxyl (OH) radical in the air. This reaction is the initial step in a series of chemical reactions in the formation of ozone. A slow reaction means the compound will likely not form ozone at a fast rate.

Two other methods for comparing reactivity levels are based on maximum incremental reactivity (MIR) expressed either on a reactivity per mass (gram) basis or on a reactivity per mole basis. The MIR values are more recently developed measures of photochemical reactivity and consider not only the initial reaction step, but also includes the complete ozone forming activity of a specific organic compound. MIR values are expressed either as grams of ozone formed per mole of VOC (molar basis), or as grams of ozone formed per gram of VOC (mass basis).

On February 18, 1998, the Great Lakes Chemical Corporation petitioned the U.S. EPA to exempt HFC-227ea from the federal VOC definition based on the fact that the k_{OH} value of the compound is well below ethane's reaction rate constant and, therefore, less reactive than ethane. HFC-227ea has a low k_{OH} value of 1.09×10^{-15} compared to ethane's 2.4×10^{-13} . Consequently, the U.S. EPA delisted HFC-227ea as a VOC beginning December 29, 2004.

On December 2, 2009, Honeywell, Inc. (Honeywell) submitted a petition to the U.S. EPA requesting that HFO-1234ze be excluded from VOC control based on the compound's low reactivity relative to ethane. The MIR on a mass basis for HFO-1234ze is 0.098 grams of ozone formed per gram of VOC, which is only 35 percent of ethane's MIR of 0.28 grams of ozone formed per gram of VOC. Based on HFO-1234ze's low photochemical reactivity, the U.S. EPA exempted HFO-1234ze as a VOC effective July 23, 2012.

On July 26, 2012, 3M formally petitioned the SCAQMD to include HFC-227ea in the definition of "Exempt Compound" in Rule 102. HFC-227ea is currently listed as a VOC-exempt compound by other California air districts, including Butte County Air Quality Management District, Eastern Kern Air Pollution Control District, Feather River Air Quality Management District, Santa Barbara County Air Pollution Control District, and Yolo-Solano Air Quality Management District.

In a letter dated August 3, 2012, Honeywell requested that the SCAQMD revise Rule 102 and also include HFO-1234ze in the rule's "Exempt Compound" definition based on its negligible contribution to tropospheric ozone formation and low toxicity.

A detailed discussion on the properties and potential uses of HFC-227ea and HFO-1234ze follows this section.

DESCRIPTION OF PROPOSED COMPOUNDS

HFC-227ea

HFC-227ea (CAS #431-89-0), is an odorless, colorless, liquefied compressed gas. It is also called by other names such 1,1,1,2,3,3,3-heptafluoropropane, heptafluoropropane, HFC-227, HFA-227ea, or HFA-227. It is stored under pressure as a liquid and discharges as a gaseous vapor due to its relatively low boiling point. Further, it is non-flammable under normal conditions, not an ozone depleter, and has a relatively low GWP compared to CFCs and Halon

1301. This compound has minimal toxic properties, and is not classified as a hazardous air pollutant under the federal Clean Air Act. The U.S. EPA exempted this compound based on its reaction rate constant (k_{OH}) being lower than ethane's. Table 1 below compares the reactivity of HFC-227ea to that of ethane.

Table 1 – Comparison of Reactivities of HFC-227ea and Ethane

| | HFC-227ea | Ethane |
|--|------------------------|-----------------------|
| k_{OH} (cm ³ /molecule-sec) | 1.09×10^{-15} | 2.4×10^{-13} |

Because of its benign toxicity properties, HFC-227ea is approved by the FDA as suitable replacement for CFC propellants in metered-dose inhalers or MDIs. Pulmonary conditions, such as asthma and chronic obstructive pulmonary diseases, have been predominantly treated with medications inhaled via the respiratory tract such as MDIs.

Typically, the drug present in the MDI accounts for less than one percent of the total volume, with nearly all the rest of the formulation being propellant. Chlorofluorocarbons, such as CFC-11 and CFC-12, are widely used as propellants because of their desirable attributes such as benign toxicology, low boiling point, good solvency, non-flammability, and density.

CFCs have been implicated in stratospheric ozone depletion and have been generally phased-out in the United States in 1996 under the terms of The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol), an international agreement designed to protect the ozone layer. The United States is a party to the Montreal Protocol, and has committed to phase out all and eventually eliminate substances that deplete the ozone layer, including CFCs. However, production or importation of CFCs for use in essential medical products, e.g. MDIs, is permitted under the Montreal Protocol.

In 1978, the Food and Drug Administration (FDA) banned the use of CFCs in all FDA-regulated products, except where medically essential, such as its use in “metered-dose steroid human drugs for oral inhalation.” As alternative propellants become available in the market, the U.S. EPA coordinates with the FDA in determining which MDIs using CFC continue to be essential for public health. For instance, the FDA removed the essential use designation for CFC-albuterol MDIs, and had been banned for sale as of December 31, 2008, pursuant to Section 610 of the Clean Air Act. Albuterol is an active medication contained in MDIs. Furthermore, the FDA announced in 2010 the phase out of several MDIs using CFCs, such as epinephrine, flunisolide, and cromolyn.

Over the last several years, manufacturers have identified and developed non-CFC propellants for use in MDIs. The 3M Company, in particular, has shifted to CFC-free MDIs by using HFA-134a (1,1,1,2-tetrafluoroethane) and HFA-227ea as propellants. HFA-134a is classified as a non-VOC compound by the U.S. EPA and SCAQMD (under Rule 102). It is also approved by the FDA as a propellant. According to 3M, the use of alternative propellants is “dependent upon the FDA-approved inhaler formulation and the active pharmaceutical drug’s solubility; therefore, HFA-134a and HFC-227ea are not interchangeable.” Further, HFC-227ea is not intended to replace HFA-134a as a propellant in existing FDA-approved formulations.

Another environmental benefit of using HFC-227ea as a propellant is that it has a GWP of 3,220, which is lower than those of the CFCs it is replacing, which range from 4,000 to 14,420. In the commercial/industrial application, HFC-227ea is used as a fire extinguishing agent for total flooding fire suppression systems. It is ideally suited for protecting high-value assets such as computers, data control centers, telecommunication facilities, and museum holdings. HFC-227ea is listed as an acceptable replacement for Halon 1301 and Halon 1211 in the U.S. EPA's Significant New Alternatives Policy (SNAP) program. Fire equipment companies, however, have been using HFC-227ea primarily as replacement for Halon 1301.

Like the halon agents, HFC-227ea has high fire suppression efficiency, no residue formation following extinguishment, is electrically non-conductive, and has low toxicity. Since the use of HFC-227ea as an extinguishing agent produces no corrosive or abrasive residues, it is ideal for protecting areas, such as libraries and museums, where the use of water or solid extinguishing agents could cause secondary damage equal to or exceeding that caused by direct fire damage. In addition, HFC-227ea has a low electrical conductivity and can be used to protect electrical and electronic equipment. HFC-227ea's low toxicity allows it to be used in areas where people are present. Further, HFC-227ea does not displace oxygen and is safe for use in occupied spaces without fear of oxygen deprivation.

Additionally, HFC-227ea's toxicity has been extensively tested for pharmaceutical use, and was approved in 1995 by the Committee for Proprietary Medicinal Products for use in medicinal products including MDIs used in asthma treatments. HFC-227ea has very low inhalation toxicity with a four-hour LC₅₀ greater than 788,696 ppm (WIL, 1992). No exposure-related effects were seen in a 90-day inhalation study involving groups of rats exposed 6 hours a day, 5 days a week, to 20,000, 50,000, or 105,000 ppm of HFC-227ea (Naas et al., 1995). HFC-227ea was negative for mutagenicity in the Ames Salmonella test (Japan Bioassay Lab., 1993) and mouse lymphoma assay (Mitchell, 1998). Further, no developmental toxicity was seen in pregnant rats and rabbits exposed during gestation to HFC-227ea concentrations as high as 105,000 ppm (DuPont, 1999).

Table 2 summarizes the physical, chemical, and environmental properties of HFC-227ea, including comparisons to CFCs and halon compounds being replaced in MDIs and fire suppression systems, respectively.

Table 2 – Physical and Chemical Properties

| | Proposed Compound HFC-227ea | CFC-11 | CFC-12 | Halon 1301 |
|-------------------|--|----------------------|---------------------------------|---------------------|
| Appearance | Clear colorless gas | Clear colorless gas | Clear colorless gas | Clear colorless gas |
| Odor | Slight ether | Sweet, ethereal odor | Ether-like odor | Slight ether |
| Molecular Formula | CF ₃ CHF ₂ CF ₃ | CCl ₃ F | CCl ₂ F ₂ | CF ₃ Br |
| Molecular Weight | 170g/mole | 137.36 g/mole | 134 g/mole | 149 g/mole |
| Boiling Point | -16.4 °C | 23.7 °C | -30 °C | -58 °C |

| | Proposed Compound HFC-227ea | CFC-11 | CFC-12 | Halon 1301 |
|---------------------------------------|--------------------------------|---------------|---------------|---------------|
| NFPA ^A Flammability Rating | 0 | 0 | 0 | 0 |
| Lower Explosive Limit | Not explosive | Not explosive | Not explosive | Not explosive |
| Upper Explosive Limit | Not explosive | Not explosive | Not explosive | Not explosive |
| Flash Point | No flashpoint | No flashpoint | No flashpoint | No flashpoint |
| Ozone Depleting Potential | 0 | 1 | 1 | 10 |
| Global Warming Potential (100 years) | 3,220 | 4,600 | 10,600 | 6,900 |

^A National Fire Protection Agency

HFO-1234ze

HFO-1234ze (CAS # 29118-24-9) is an odorless, colorless, liquefied compressed gas. It is also known as trans-1,3,3,3-tetrafluoropropene.

In 2009, Honeywell, Inc. petitioned the U.S. EPA to exclude HFO-1234ze from VOC controls based on the compound's low reactivity relative to ethane. Table 3 below compares the reactivities of HFO-1234ze to that of ethane.

Table 3 – Comparison of Reactivities of HFO-1234ze and Ethane

| | HFO-1234ze | Ethane |
|---|--------------------------|-------------------------|
| gram ozone/gram VOC | 0.098 | 0.28 |
| gram ozone/mole VOC | 11.2 | 8.4 |
| k _{OH} (cm ³ /molecule-sec) | 9.25 x 10 ⁻¹³ | 2.4 x 10 ⁻¹³ |

The above data shows that HFO-1234ze has a higher k_{OH} than ethane, i.e., it initially reacts more quickly in the atmosphere than ethane. HFO-1234ze's MIR value calculated as gram ozone/mole VOC indicate that its molecule is more reactive than ethane. However, the MIR on a mass basis for HFO-1234ze is a low 0.098 grams of ozone formed per gram of VOC, which is only 35 percent that of ethane (ethane's MIR is 0.28 grams of ozone formed per gram of VOC). Based on HFO-1234ze's lower photochemical reactivity than ethane, the U.S. EPA exempted HFO-1234ze as a VOC effective July 23, 2012.

HFO-1234ze is not a hazardous air pollutant under the Clean Air Act. It is not classified as an ozone depleting substance, and has a very low GWP of 6. In addition, HFO-1234ze has a very low order of toxicity based on results of extensive toxicological testing.

This compound is non-flammable and can be used as an aerosol propellant, a blowing agent in foam manufacturing, and as a refrigerant in stationary refrigeration applications. As an aerosol propellant, HFO-1234ze is expected to replace HFC-134a used in technical aerosols, including cleaners for electronics, dusters and freeze sprays, mold release, and spray lubricants. Such aerosols are used in manufacturing, maintenance, and repair facilities. HFO-1234ze may also be used in household products, including personal care products, where it would replace hydrocarbon or HFC-152a propellants, potentially resulting in VOC reductions from the California Air Resources Board's Consumer Products Regulation. The GWP of HFO-1234ze is much lower than that of HFC-134a and HFC-152a; therefore, its use as propellant replacement will reduce greenhouse gas emissions.

HFO-1234ze can also be used as a foam blowing agent in extruded polystyrene (XPS) operations. Based on Annual Emissions Reporting data submitted by foam manufacturers to SCAQMD, pentane is currently being used as foam blowing agent for such operation. Pentane is classified as a VOC, and its potential replacement as a blowing agent may translate to a VOC emission reductions benefit.

Table 4 summarizes the properties of HFO-1234ze and pentane which is currently being used as a blowing agent in XPS operations.

Table 4 – Properties for HFO-1234ze and Pentane

| | Proposed Compound | Currently Used Blowing Agent |
|---------------------------------------|--|-------------------------------------|
| | HFO-1234ze | Pentane |
| Appearance | Clear colorless gas | Clear colorless liquid |
| Odor | Slight ethereal | Mild pleasant, gasoline like |
| Molecular Formula | C ₃ H ₂ F ₄ | C ₅ H ₁₂ |
| Molecular Weight | 114 g/mol | 72.15 g/mole |
| NFPA ^A Flammability Rating | 1 | 4 |
| Lower Explosive Limit | 7.0% | 1.5% |
| Upper Explosive Limit | 9.5% | 7.8% |
| Flash Point | None | -49 °C (-56.2 °F) |
| Ozone Depleting Potential | 0 | 0 |
| Global Warming Potential (100 years) | 6 | 11 |

^A National Fire Protection Agency

LEGISLATIVE AUTHORITY

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977 (The Lewis-Presley Air Quality Management Act, California Health and Safety Code Section 40400 et seq.) as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin). By statute, the SCAQMD is required to adopt an Air Quality Management Plan (AQMP) demonstrating compliance with all state and federal ambient air quality standards for the Basin [California Health and Safety Code Section 40460(a)]. Furthermore, the SCAQMD must adopt rules and regulations that carry out the AQMP [California Health and Safety Code Section 40440(a)].

PROPOSED RULE AMENDMENTS

Staff's proposal will expand the definition of Group I VOC-exempt compounds in Rule 102 to include the hydrofluorocarbon compound HFC-227ea and hydrofluoro olefin HFO-1234ze. The toxicity of HFC-227ea is considered benign based on extensive toxicological studies conducted to demonstrate its safety in general use and as a propellant in metered-dose inhalers. In addition, HFC-227ea is not an ozone depleter (zero ODP) and has a relatively low global warming potential compared to halon compounds it intends to replace.

Currently, HFC-227ea is listed as a VOC-exempt compound by other California air districts, including Butte County Air Quality Management District, Eastern Kern Air Pollution Control District, Feather River Air Quality Management District, Santa Barbara County Air Pollution Control District, and Yolo-Solano Air Quality Management District.

HFO-1234ze has a very low order of toxicity, and an ultra low global warming potential (GWP = 6). Furthermore, HFO-1234ze is not an ozone depleting substance; thus, this compound is suited for inclusion under Group I exempt compounds.

EMISSIONS INVENTORY AND REDUCTIONS

Based on 2011 AER data and industry input, replacing pentane as blowing agent in XPS foam manufacturing with a VOC-exempt HFO-1234ze would potentially reduce VOC emissions by about 83 tons per year or about 0.23 tons/day, with additional potential VOC reductions for consumer products in aerosol form. Furthermore, the use of HFO-1234ze as replacement for high-GWP propellants (e.g. HFC-134a) in other aerosol consumer products would result in greenhouse gas emission reductions.

HFC-227ea is expected to replace CFCs, e.g., CFC-11 and CF-12, as propellants in MDIs. Since these CFCs are considered VOC-exempt compounds, no VOC emission reduction is anticipated from this product replacement. However, the use of HFC-227ea as replacement for CFC propellants will reduce greenhouse gas emissions because of HFC-227ea's lower GWP.

COST IMPACT

HFC-227ea can be used as a propellant in MDIs and as a fire extinguishing agent. There is only one company in the Basin with the potential to switch to HFC-227ea. This facility currently uses CFCs for propellants. As a result, this facility also pays ODC emission fees. There will be no emission fees for HFC-227ea. This, together with, the lower price of HFC-

27ea (compared to that of CFCs) will incentivize the switch to HFC-227ea. The savings is approximately \$420,000 annually.

HFO-1234ze can be used as an aerosol propellant, a blowing agent in foam manufacturing, and a refrigerant. In the Basin there are two plastic foam manufacturers that may have the potential to switch to HFO-1234ze to avoid paying VOC emission fees for pentane which is used currently. Since the price of HFO-1234ze is six times that of pentane, switch to HFO-1234ze may not be economical at this time. However, these two companies are not compelled to switch to HFO-1234ze due to the voluntary nature of the proposed amendments.

INCREMENTAL COST-EFFECTIVENESS

California Health and Safety Code Section 40920.6 requires the SCAQMD to perform an incremental cost effectiveness analysis when adopting a Best Available Retrofit Control Technology (BARCT) rule or feasible measure required by the California Clean Air Act. To perform this analysis, the SCAQMD must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule; (2) determine the cost-effectiveness for each option; and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the SCAQMD must “calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option.” The proposed amendments to Rule 102 do not implement a more restrictive BARCT or feasible control measure; therefore, Section 40920.6 is not applicable.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The SCAQMD has reviewed the proposed amendments to Rule 102 pursuant to CEQA Guidelines §15002(k)(1) – Three Step Process, for deciding which document to prepare for a project subject to CEQA and CEQA Guidelines §15061 – Review for Exemption, and has determined that the proposed amendments are exempt from CEQA pursuant to CEQA Guidelines §15061 (b)(3). Evaluation of the proposed project resulted in the conclusion that it will not create any significant adverse effects on air quality or any other environmental areas. The proposed project may produce beneficial effects by reducing VOC emissions and may reduce potential hazard impacts at facilities that replace currently used organic compounds with one or both of the two compounds proposed to be added to the list of exempt compounds in Rule 102 because they are generally less flammable than the organic compounds they would be replacing. Therefore, it can be seen with certainty that there is no possibility that the proposed project may have significant adverse effects on the environment.

Since it can be seen with certainty that the proposed project has no potential to adversely affect air quality or any other environmental area, it is exempt from CEQA pursuant to CEQA Guidelines §15061(b)(3). If adopted, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties immediately following the adoption of the proposed project.

COMPARATIVE ANALYSIS

The proposed amendment to Rule 102 does not impose emission control requirements on any equipment or source and, therefore, the analysis required by the California Health and Safety Code §40727.2 cannot be performed.

DRAFT FINDINGS UNDER THE CALIFORNIA HEALTH AND SAFETY CODE

Before adopting, amending, or repealing a rule, the California Health and Safety Code requires the SCAQMD to adopt written findings of necessity, authority, clarity, consistency, non-duplication, and reference, as defined in Section 40727. The draft findings are as follows:

Necessity - The SCAQMD Governing Board has determined that a need exists to amend Rule 102 - Definition of Terms to incorporate new compounds delisted by U.S. EPA from the federal VOC definition.

Authority - The SCAQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from the California Health and Safety Code sections 39002, 40000, 40001, 40440, 40441, 40702, 41508, and 41700.

Clarity - The SCAQMD Governing Board has determined that the proposed amendment to Rule 102 - Definition of Terms is written or displayed so that its meaning can be easily understood by persons directly affected by it.

Consistency - The SCAQMD Governing Board has determined that Proposed Amended Rule 102 - Definition of Terms is in harmony with, and not in conflict with or contradictory to, existing federal or state statutes, court decisions, or regulations.

Non-Duplication - The SCAQMD Governing Board has determined that the proposed amendment to Rule 102 - Definition of Terms does not impose the same requirement as any existing state or federal regulation, and the proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the SCAQMD.

Reference - In adopting this regulation, the SCAQMD Governing Board references the following statutes which the SCAQMD hereby implements, interprets or makes specific: Health and Safety Code sections 40001, 40440, and 40702.

PUBLIC COMMENTS AND RESPONSES

COMMENT: We are requesting SCAQMD to add tertiary butyl acetate (TBAC) and dimethyl carbonate (DMC) to the proposed list of exempt compounds in PAR 102 so it can be used in formulating AIM coatings. Both compounds have been exempted by the U.S. EPA as a VOC.

RESPONSE: Staff previously analyzed the ambient health risks from TBAC's primary metabolite, Tertiary Butanol, and determined that the risks, especially for workers applying TBAC-containing coatings, may exceed threshold levels; therefore, staff is not proposing TBAC as an exempt solvent.

Previously, the SCAQMD has carefully carved out limited exemptions only in areas where the use of personal protective equipment (PPE) is widespread, such as in automotive refinishing and industrial maintenance coatings, minimizing potential exposure and any corresponding risks to workers.

In regards to DMC, in September 2009, the SCAQMD's Governing Board rejected delisting DMC due to potential health concerns, especially risks to the workers. To date, the SCAQMD has considered only a limited exemption for DMC, such as in Rule 1144-Metalworking Fluids and Direct Contact Lubricants, where any potential exposure to workers is minimized.

As a part of Proposed Amended Rule 1107 – Coating of Metal Parts and Products, staff proposed limited exemptions for TBAC and DMC, but based on comments from the public, again pertaining to potential worker exposure, has delayed any such proposal. The SCAQMD plans to work with health experts, state and federal agencies, and other interested stakeholders in developing a path to analyze and address worker exposure issues related to the use of TBAC and DMC. As an initial step, the SCAQMD is planning to hold a conference to highlight and discuss work exposure issues and develop potential approaches to minimize such risks.

COMMENT: We support both compounds being added to your VOC exempt list.

RESPONSE: Staff acknowledges the comment in support of the proposed amendment.

REFERENCES

Noakes, T. (2002). Medical Aerosol Propellants. *Journal of Fluorine Chemistry*, 118, 35-45

Hu, P., & Chen, Z. (2004). Saturated Densities and Critical Properties of HFC-227ea. *Fluid Phase Equilibria*, 221, 7-13.

Emmen, H., Hoogendijk, E., Klopping-Ketelaars, W., Muijser, H., Duistermaat, E., Ravensberg, J., & et al. (2000). Human Safety and Pharmacokinetics of the CFC Alternative Propellants HFC 134a (1,1,1,2-tetrafluoroethane) and HFC-227 (1,1,1,2,3,3,3-heptafluoropropane) Following Whole-Body Exposure. *Regulatory Toxicology and Pharmacology*, 32, 22-35.

Dupont. (2004). *Dymel 227ea/Pharmaceutical Propellant Toxicity Summary May 2004*.

Dupont. *Dupont FE-227 Fire extinguishing Agent (HFC-227ea) properties, Uses, Storage, and Handling*.

Dupont. *Dupont FE-227 Fire extinguishing Agent Technical Information*.

Meyer, R. (1999). A United States Regulator's Perspective on the Ongoing Chlorofluorocarbon Transition.

Dunn, B. (2008). 1,3,3,3-Tetrafluoropropylene: Toxicology Summary

Muijser, H. (2008). TNO Report. Sub-chronic (13-week) Inhalation Toxicity Study with HFO-1234ze in Rats

Rusch, G. (2004). Trans HFO-1234: An acute (4-hour) Inhalation Toxicity Screening Study with a Micronucleus Assay in the Mouse and Rat Via Nose-Only Exposure

Japan Bioassay Research Center (2009). Mutagenicity Test of (*E*) 1,3,3,3-Tetrafluoroprop-1-ene Using Microorganisms (Reverse-Mutation Assay of (*E*) 1,3,3,3-Tetrafluoroprop-1-ene in Bacteria)

Honeywell Powerpoint Slides on HFO-1234ze

Internet Materials:

Federal Register, Volume 69, Number 228

(<http://www.gpo.gov/fdsys/pkg/FR-2004-11-29/pdf/04-26070.pdf>)

Federal Register, Volume 77, Number 121

(www.gpo.gov/fdsys/pkg/FR-2012-06-22/html/2012-15347.htm)

The Role of Hydrofluorocarbons in Global Fire Protection

(http://www2.dupont.com/FE/en_US/assets/downloads/pdf/k22197_Role_of_HFCs_white_paper.pdf)

Metered-Dose Inhalers. The Transition to Ozone-Safe Propellants

(<http://www.epa.gov/ozone/title6/exemptions/inhalers.html>)

The Next Generation of Metered-Dose Inhalers

(<http://legacy.uspharmacist.com>)

HFC-227ea Clean Fire Suppression Agent. Fike Corporation.

(www.fike.com/pub/fpsdocs/c.1.07.01.pdf)

HBA-1 Blowing Agent Commercialization Status – Honeywell

(http://www51.honeywell.com/sm/lgwp-uk/common/documents/FP_LGWP_UK_CPI-2008-Honeywell_Literature_document.pdf)

ATTACHMENT G



South Coast
Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

SUBJECT: NOTICE OF EXEMPTION FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

PROJECT TITLE: PROPOSED AMENDED RULE 102 – DEFINITION OF TERMS

Pursuant to the California Environmental Quality Act (CEQA) Guidelines, the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and will prepare a Notice of Exemption for the project identified above.

On December 29, 2004, the U.S. EPA excluded from the federal definition of volatile organic compound (VOC) 1,1,1,2,3,3,3,-heptafluoropropane (commonly known as HFC-227ea) and on July 23, 2012, the U.S. EPA excluded from the federal definition of VOC trans-1,3,3,3-tetrafluoropropene (also known as HFO-1234ze) on the basis that these compounds have negligible contribution to the formation of tropospheric ozone. These compounds have low or minimal toxicity, are not listed as hazardous air pollutants under the federal Clean Air Act, have a flammability rating equal to or less than comparable VOC compounds, have an ozone depleting potential (ODP) less than or equal to comparable compounds, and have a lower global warming potential (GWP) than comparable compounds. Based on staff's review of relevant data pertaining to these two compounds, the SCAQMD is now proposing to add HFC-227ea and HFO-1234ze to the list of compounds exempt from the definition of VOC as Group I compounds in Rule 102. Evaluation of the proposed project resulted in the conclusion that it will not create any adverse effects on air quality or any other environmental areas. Therefore, it can be seen with certainty that there is no possibility that the proposed project may have a significant adverse effect on the environment. Since it can be seen with certainty that the proposed project has no potential to adversely affect air quality or any other environmental area, it is exempt from CEQA pursuant to CEQA Guidelines §15061(b)(3) – Review for Exemption. Upon adoption, the Notice of Exemption will be filed with the county clerks of Los Angeles, Orange, Riverside and San Bernardino counties.

Any questions regarding this Notice of Exemption should be sent to Jeff Inabinet (c/o Planning, Rule Development & Area Sources) at the above address. Mr. Inabinet can also be reached at (909) 396-2453.

Date: March 1, 2013

Signature: Steve Smith

Steve Smith, Ph.D.
Program Supervisor
Planning, Rule Development &
Area Sources

NOTICE OF EXEMPTION

| | |
|--|---|
| To: County Clerks of Los Angeles, Orange, Riverside, San Bernardino | From: South Coast Air Quality Management District 21865 Copley Drive Diamond Bar, CA 91765 |
|--|---|

Project Title:

Proposed Amended Rule 102 – Definition of Terms

Project Location:

South Coast Air Quality Management District (SCAQMD) area of jurisdiction consisting of the four-county South Coast Air Basin (Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin and the Mojave Desert Air Basin.

Description of Nature, Purpose, and Beneficiaries of Project:

On December 29, 2004, the U.S. EPA excluded from the federal definition of volatile organic compound (VOC) 1,1,1,2,3,3,3,-heptafluoropropane (commonly known as HFC-227ea) and on July 23, 2012, the U.S. EPA excluded from the federal definition of VOC trans-1,3,3,3-tetrafluoropropene (also known as HFO-1234ze) on the basis that these compounds have negligible contribution to the formation of tropospheric ozone. These compounds have low or minimal toxicity, are not listed as hazardous air pollutants under the federal Clean Air Act, have a flammability rating equal to or less than comparable VOC compounds, have an ozone depleting potential (ODP) less than or equal to comparable compounds, and have a lower global warming potential (GWP) than comparable compounds. Based on staff's review of relevant data pertaining to these two compounds, the SCAQMD is now proposing to add HFC-227ea and HFO-1234ze to the list of compounds exempt from the definition of VOC as Group I compounds in Rule 102. Staff estimates that PAR 102 may potentially reduce about 83 tons per year of VOC emissions from foam manufacturing operations that replace currently-used foam blowing agents with HFO-1234ze and may also reduce flammability risks associated with currently used foam-blowing agents. The potential use of HFO-1234ze as a substitute for hydrocarbon propellants may also result in VOC reductions from consumer products in aerosol form.

Public Agency Approving Project:

South Coast Air Quality Management District

Agency Carrying Out Project:

South Coast Air Quality Management District

Exempt Status:

General Concepts [CEQA Guidelines §15002 (k)(1)];
Statute Exemption [CEQA Guidelines §15061 (b)(1)]; and
General Rule Exemption [CEQA Guidelines §15061 (b)(3)]

Reasons why project is exempt:

The SCAQMD has reviewed the proposed amendments to Rule 102 pursuant to CEQA Guidelines §15002(k)(1) – Three Step Process, and CEQA Guidelines §15061 – Review for Exemption, and has determined that the proposed amendments are exempt from CEQA pursuant to CEQA Guidelines §15061 (b)(3) (“General Rule Exemption”). Evaluation of the proposed project resulted in the conclusion that it will not create any adverse effects on air quality or any other environmental areas. The proposed project may produce beneficial effects by reducing VOC emissions and may reduce potential hazard impacts at facilities that replace currently used organic compounds with the two compounds proposed to be added to the list of exempt compounds in Rule 102. Therefore, it can be seen with certainty that there is no possibility that the proposed project may have a significant adverse effect on the environment. Since it can be seen with certainty that the proposed project has no potential to adversely affect air quality or any other environmental area, it is exempt from CEQA pursuant to CEQA Guidelines §15061(b)(3) – Review for Exemption.

Certification Date:

SCAQMD Governing Board Hearing: March 1, 2013, 9:00 a.m.; SCAQMD Headquarters

| CEQA Contact Person: | Phone Number: | Fax Number: | Email: |
|-----------------------------|----------------------|--------------------|----------------------|
| Mr. Jeffrey Inabinet | (909) 396-2453 | (909) 396-3324 | <jinabinet@aqmd.gov> |
| Rule Contact Person: | Phone Number: | Fax Number: | Email: |
| Mr. Henry Pourzand | (909) 396-2338 | (909) 396-2414 | <rpourzand@aqmd.gov> |

Date Received for Filing _____

Signature Signed upon certification _____

Steve Smith, Ph.D.
Program Supervisor
Planning, Rule Development
and Area Sources