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DIVISION OF AIR QUALITY
Bryce C. Bird
Director

DAQ-030-14

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Bryce C. Bird, Executive Secretary

FROM: Joel Karmazyn, Environmental Scientist

DATE: March 18, 2014

SUBJECT: PROPOSE FOR PUBLIC COMMENT: Amend R307-335. Degreasing and Solvent Cleaning Operations.

IM Flash Technologies, LLC has petitioned the Board to amend R307-335 by setting a volatile organic compound (VOC) content limit of 6.7 lb/gallon for semiconductor tools, maintenance, and equipment cleaning because they must use 100% isopropyl alcohol in their clean room operations to eliminate moisture on sensitive surfaces without leaving a residue. The use of 100% high purity isopropyl alcohol is the industry standard for this type of cleaning, and the 6.7 lb/gallon proposed limit is consistent with other air district rules such as the South Coast Rule 1171.

Staff Recommendation: Staff recommends the Board propose for public comment R307-335 as amended.

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R307. Environmental Quality, Air Quality.
R307-335. Degreasing and Solvent Cleaning Operations.
R307-335-1. Purpose.

The purpose of this rule is to limit volatile organic compound (VOC) emission from degreasing and solvent cleaning operations.

R307-335-2. Applicability.

R307-335 applies to all degreasing or solvent cleaning operations that use VOCs and that are located in PM10 and PM2.5 nonattainment and maintenance plan areas as defined in 40 CFR 81.345 (July 1, 2011).

R307-335-3. Definitions.

The following additional definitions apply to R307-335:

"Batch open top vapor degreasing" means the batch process of cleaning and removing grease and soils from metal surfaces by condensing hot solvent vapor on the colder metal parts.

"Cold cleaning" means the batch process of cleaning and removing soils from metal surfaces by spraying, brushing, flushing or immersing while maintaining the solvent below its boiling point.

"Conveyorized degreasing" means the continuous process of cleaning and removing greases and soils from metal surfaces by using either cold or vaporized solvents.

“Department of Defense military technical data” means a specification that specifies design requirements, such as materials to be used, how a requirement is to be achieved, or how an item is to be fabricated or constructed.

"Freeboard ratio" means the freeboard height (distance between solvent line and top of container)divided by the width of the degreaser.

"Industrial solvent cleaning" means operations performed using a liquid that contains any VOC, or combination of VOCs, which is used to clean parts, tools, machinery, equipment and work areas. Cleaning operations include, but are not limited to, spraying, wiping, flushing, and purging.

"Open top vapor degreaser" means the batch process of cleaning and removing soils from metal surfaces by condensing low solvent vapor on the colder metal parts.

"Separation operation" means any process that separates a mixture of compounds and solvents into two or more components. Specific mechanisms include extraction, centrifugation, filtration, and crystallization.

"Solvent metal cleaning" means the process of cleaning soils from metal surfaces by cold cleaning, open top vapor degreasers, or conveyorized degreasing.

R307-335-4. Cold Cleaning Facilities.

No owner or operator shall operate a degreasing or solvent cleaning operation unless conditions in R307-335-4(1) through (7) are met.

(1) A cover shall be installed which shall remain closed except during actual loading, unloading or handling of parts in cleaner. The cover shall be designed so that it can be easily operated with one hand if:

(a) The volatility of the solvent is greater than 2 kPa (15 mm Hg or 0.3 psi) measured at 38 degrees C (100 degrees F),

(b) The solvent is agitated, or

(c) The solvent is heated.

(2) An internal draining rack for cleaned parts shall be installed on which parts shall be drained until all dripping ceases. If the volatility of the solvent is greater than 4.3 kPa (32 mm Hg at 38 degrees C (100 degrees F)), the drainage facility must be internal, so that parts are enclosed under the cover while draining. The drainage facility may be external for applications where an internal type cannot fit into the cleaning system.

(3) Waste or used solvent shall be stored in covered containers.

(4) Tanks, containers and all associated equipment shall be maintained in good operating condition, and leaks shall be repaired immediately or the degreaser shall be shutdown.

(5) Written procedures for the operation and maintenance of the degreasing or solvent cleaning equipment shall be permanently posted in an accessible and conspicuous location near the equipment.

(6) If the solvent volatility is greater than 4.3 kPa (33 mm Hg or 0.6 psi) measured at 38 degrees C (100 degrees F), or if solvent is heated above 50 degrees C (120 degrees F), then one of the following control devices shall be used:

(a) Freeboard that gives a freeboard ratio greater than 0.7;

(b) Water cover if the solvent is insoluble in and heavier than water); or

(c) Other systems of equivalent control, such as a refrigerated chiller or carbon adsorption.

(7) If used, the solvent spray shall be a solid fluid stream at a pressure that does not cause excessive splashing and may not be a fine, atomized or shower type spray.

R307-335-5. Open Top Vapor Degreasers.

Owners or operators of open top vapor degreasers shall, in addition to meeting the requirements of R307-335-4(3), (4) and (5),

(1) Equip the vapor degreaser with a cover that can be opened and closed without disturbing the vapor zone. The cover shall be closed except when processing work loads through the degreaser;

(2) Install one of the following control devices:

(a) Equipment necessary to sustain:

(i) A freeboard ratio greater than or equal to 0.75, and

(ii) A powered cover if the degreaser opening is greater than 1 square meter (10.8 square feet),

(b) Refrigerated chiller,

(c) Enclosed design (cover or door opens only when the dry part is actually entering or exiting the degreaser),

(d) 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 air/vapor area when cover is open and exhausting less than 25 parts per million of solvent averaged over one complete adsorption cycle;

(3) Minimize solvent carryout by:

(a) Racking parts to allow complete drainage,

(b) Moving parts in and out of the degreaser at less than 3.3 meters per minute (11 feet per minute),

(c) Holding the parts in the vapor zone at least 30 seconds or until condensation ceases,

(d) Tipping out any pool of solvent on the cleaned parts before removal, and

(e) Allowing the parts to dry within the degreaser for at least 15 seconds or until visibly dry.

(4) Spray parts only in or below the vapor level;

(5) Not use ventilation fans near the degreaser opening, nor provide exhaust ventilation exceeding 20 cubic meters per minute per square meter (65 cubic feet per minute per square foot) in degreaser open area, unless necessary to meet state and federal occupational, health, and safety requirements.

(6) Not degrease porous or absorbent materials, such as cloth, leather, wood or rope;

(7) Not allow work loads to occupy more than half of the degreaser's open top area;

(8) Ensure that solvent is not visually detectable in water exiting the water separator;

(9) Install safety switches on the following:

(a) Condenser flow switch and thermostat (shuts off sump heat if condenser coolant is either not circulating or too warm); and

(b) Spray switch (shuts off spray pump if the vapor level drops excessively, i.e., greater than 10 cm (4 inches).

(10) Open top vapor degreasers with an open area smaller than one square meter (10.8 square feet) are exempt from R307-335-5(2)(b) and (d).

R307-335-6. Conveyorized Degreasers.

Owners and operators of conveyorized degreasers shall, in addition to meeting the requirements of R307-335-4(3), (4) and (5) and R307-335-5(5):

(1) Install one of the following control devices for conveyorized degreasers with an air/vapor interface equal to or greater than two square meters (21.5 square feet):

(a) Refrigerated chiller; or

(b) 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 air/vapor area when downtime covers are open, and exhausting less than 25 parts per million of solvent, by volume, averaged over a complete adsorption cycle.

(2) Equip the cleaner with equipment, such as a drying tunnel or rotating (tumbling) basket, sufficient to prevent cleaned parts from carrying out solvent liquid or vapor.

(3) Provide downtime covers for closing off the entrance and exit during shutdown hours. Ensure that down-time cover is placed over entrances and exits of conveyorized degreasers immediately after the conveyor and exhaust are shut down and is removed just before they are started up.

(4) Minimize carryout emissions by racking parts for best drainage and maintaining the vertical conveyor speed at less than 3.3

meters per minute (11 feet per minute).

(5) Minimize openings: Entrances and exits should silhouette work loads so that the average clearance (between parts and the edge of the degreaser opening) is either less than 10 cm (4 inches) or less than 10% of the width of the opening.

(6) Install safety switches on the following:

(a) Condenser flow switch and thermostat - shuts off sump heat if coolant is either not circulating or too warm;

(b) Spray switch - shuts off spray pump or conveyor if the vapor level drops excessively, i.e., greater than 10 cm or (4 inches); and

(c) Vapor level control thermostat - shuts off sump level if vapor level rises too high.

(7) Ensure that solvent is not visibly detectable in the water exiting the water separator.

R307-335-7. Industrial Solvent Cleaning.

(1) Exemptions. The requirements of R307-335-7 do not apply to aerospace, wood furniture, shipbuilding and repair, flat wood paneling, large appliance, metal furniture, paper film and foil, plastic parts, miscellaneous metal parts coatings and light autobody and truck assembly coatings, flexible packaging, lithographic and letterpress printing materials, fiberglass boat manufacturing materials, and operations that are exclusively covered by Department of Defense military technical data and performed by a Department of Defense contractor and/or on site at installations owned and/or operated by the United States Armed Forces.

(2) Operators of industrial solvent cleaning that emit 15 pounds of VOCs or more per day from industrial solvent cleaning operations, shall reduce VOC emissions from the use, handling, storage, and disposal of cleaning solvents and shop towels by implementing the following work practices:

(a) Covering open containers; and

(b) Storing used applicators and shop towels in closed fire proof containers, and

(c) Limiting VOC emissions by either:

(i) Using solvents with a VOC limit in Table 1; or

(ii) Installing an emission control system designed to have an overall control efficiency of at least 85%.

TABLE 1
Solvent Cleaning VOC Limits

Solvent Cleaning Category	VOC Limit (lb/gal)
Coatings, adhesives & ink manufacturing	4.2
Electronic parts & components	4.2
General miscellaneous cleaning	2.5
Medical devices and pharmaceutical	
Tools, equipment & machinery	6.7
General surface cleaning	5.0
Screening printing operations	4.2
Semiconductor tools, maintenance & equipment Cleaning	6.7

R307-335-8. Emission Control Systems.

(1) The owner or operator of a control device shall maintain certification from the manufacturer that the emission control system will attain at least 85% overall efficiency performance and make the certification available to the director upon request.

(2) Emission control systems shall be operated and maintained in accordance with the manufacturer recommendations to maintain at least 85% overall efficiency performance. The owner or operator shall maintain for a minimum of two years records of operating and maintenance sufficient to demonstrate that the equipment is being operated and maintained in accordance with the manufacturer recommendations.

R307-335-9. Recordkeeping.

The owner or operator shall maintain, for a minimum of two years, records of the solvent VOC content applied and the physical characteristics that demonstrate compliance with R307-335.

R307-335-10. Compliance Schedule.

(1) All sources shall be in compliance with R307-335-7 by [~~July~~]August 1, 2014.

KEY: air pollution, degreasing, solvent cleaning
Date of Enactment or Last Substantive Amendment: 2014
Notice of Continuation: February 1, 2012
Authorizing, and Implemented or Interpreted Law: 19-2-104(1)(a)

UTAH DEPARTMENT OF
ENVIRONMENTAL QUALITY

FEB 2 1 2014

DIVISION OF AIR QUALITY

FLASH
TECHNOLOGIES

February 20, 2014

Mr. Bryce Bird, Director
Utah Division of Air Quality
P.O. Box 144820
Salt Lake City, Utah 84114-4820

RE: Discovery of compliance concern during self-evaluation of new rules established to address the PM2.5 State Implementation Plan.

Dear Mr. Bird,

During a recent environmental management system assessment, IM Flash Technologies, LLC (IM Flash) discovered a compliance concern related to R307-355 – Degreasing and Solvent Cleaning.

IM Flash manufactures semiconductors in a clean room environment using tools that require periodic maintenance. Preventive maintenance procedures established by tool vendors require the use of 100% Isopropyl alcohol (IPA) that meets high purity standards established by the industry. As currently written, R307-335 does not allow the use of 100% IPA for wipe cleaning activities.

IM Flash is consulting with the Utah Division of Air Quality to pursue an amendment to the rule to allow the use of 100% IPA for wipe cleaning activities associated with semiconductor manufacturing tool and equipment maintenance. When this rule is amended, this compliance concern will be resolved.

If you have questions regarding this notification, please contact Michael Smith at (801) 767-5526.

Regards,

Brad Mortensen
Facilities Manager

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