Chapter NR 421

CONTROL OF ORGANIC COMPOUND EMISSIONS FROM CHEMICAL, COATINGS AND RUBBER PRODUCTS MANUFACTURING

NR 421.01 Applicability; purpose. (1) APPLICABILITY. This chapter applies to all chemical, coatings and rubber products manufacturing air contaminant sources and to their owners and operators.

(2) PURPOSE. This chapter is adopted under ss. 144.31 and 144.38, Stats., to categorize organic compound emissions from chemical, coatings and rubber products manufacturing sources into separate organic compound air contaminant source categories and to establish emission limitations for these categories of sources in order to protect air quality.

History: Cr. Register, September, 1986, No. 369, eff. 10-1-86; am. Register, February, 1990, No. 410, eff. 3-1-90.

NR 421.02 Definitions. The definitions in this section apply to the terms used in chs. NR 421 to 425. In addition, the definitions in chs. 400, 419 and 420 apply to the terms used in this chapter.

(1) "Bead dipping" means the dipping of an assembled tire bead into a solvent based cement.

(1m) "Blending tank" means any vessel in which resin, coating or other materials, or any combination thereof, are added to produce product blend.

(2e) "Coatings manufacturing facility" means any facility which mixes, blends or compounds paints, varnishes, lacquers, enamels, shellacs or sealers, and which is classified under standard industrial classification code 2851, as determined in s. NR 407.04 (1) (a).

(2s) "Completed resin" is any resin which has completed its processing and is available for use in the basic components of plastics or as a component of surface coating formulations.

(3) "Green tires" means assembled tires before molding and curing have occurred.

(4) "Green tire spraying" means the spraying of green tires, both inside and outside, with release compounds which help remove air from the tire during molding and prevent the tire from sticking to the mold after curing.

(4e) "Grinding mill" means any mill with cylindrical chambers containing grinding media such as balls, pebbles, or sand which grind and disperse coating solids.

(4s) "High speed dispersion mill" means any mixer with one or more blades that rotate at high speed in order to disperse coating solids.

(6) "Passenger type tire" means agricultural, airplane, industrial, mobile home, light and medium duty truck, and passenger vehicle tires with a bead diameter up to 50.8 cm (20 inches) and cross section dimension up to 32.5 cm (12.8 inches).

(7) "Pneumatic rubber tire manufacture" means the production of pneumatic rubber passenger type tires on a mass production basis.

(8) "Production equipment exhaust system" means a device for collecting and directing out of the work area fugitive emissions from reactor openings, centrifuge openings, and other vessel openings at a pharmaceutical manufacturing plant.

(8m) "Reaction tank" means any piece of equipment in which organic or other materials are reacted to produce a resin. A reaction tank may include a stripping column, condensers, and a water separator, which return the evaporated solvent to the reaction vessel.

(9) "Reactor" means a vat or vessel, which may be jacketed to permit temperature control, designed to contain chemical reactions.

(10e) "Resin" means a solid or semi-solid, water-insoluble, organic material with little or no tendency to crystallize and which is used as the basic components of plastics or as a component of surface-coating formulations.

(10s) "Roller mill" means any mill with horizontal rollers that grind and disperse coating solids.

(10w) "Synthesized pharmaceutical manufacturing" means manufacture of pharmaceutical products by chemical synthesis.

(11e) "Synthetic resin manufacturing facility" means any facility which reacts organic compounds to produce a synthetic resin and which is classified under standard industrial classification code 2821, as determined in s. NR 407.04 (1) (a).

(11s) "Thinning tank" means any vessel in which resin, coating, or other products are combined with solvents to thin the product.

(11w) "Tread end cementing" means the application of a solvent based cement to tire tread ends.

(12) "Undertread cementing" means the application of a solvent based cement to the underside of a tire tread.

(12m) "VOC emission leak" means a fugitive emission of volatile organic compounds from any valve, pump, sealed agitator, compressor, flange or relief valve for which the fugitive VOC concentration is measured to exceed 10,000 ppm when tested according to Method 21 in Appendix A of 40 C.F.R. part 60, incorporated by reference in ch. NR 484.

(13) "Water based sprays" means release compounds, sprayed on the inside and outside of green tires, in which solids, water, and emulsifiers have been substituted for all organic solvents.

History: Renum. from NR 154.01, cr. (1m), (2e), (2s), (4e), (4s), (9m), (10e), (10s), (11e) and (11s), Register, September, 1986, No. 369, eff. 10-1-86; renum. (2) and (5) to be NR 400.02 (22) and (51m), cr. (12m), Register, February, 1990, No. 410, eff. 3-1-90; renum. (10) and (11) to be (10w) and (11w) under s. 13.93 (2m) (b) 1, Stats., Register, August, 1990, No. 416.

NR 421.03 Chemical manufacture. (1) PHARMACEUTICAL MANUFACTURE. (a) *Applicability.* This subsection applies, subject to the provisions of s. NR 425.03, to all operations at pharmaceutical manufacturing facilities involved in the manufacture of pharmaceutical products by chemical synthesis, with the exception of any reactor, distillation unit, dryer, filter, crystallizer, centrifuge, or other individual operation that has a potential emission rate of less than 6.8 kilograms per day (15 pounds per day).

(b) *Emission control requirements.* Except as provided under par. (a), the owner or operator of a synthesized pharmaceutical manufacturing facility shall:

1. Equip each vent from reactors, distillation operations, crystallizers, centrifuges, or vacuum dryers with surface condensers or an equally effective control device as approved by the department. If a surface condenser is used, the condenser outlet gas temperature may not exceed:

a. —25°C (—13°F) for VOCs with vapor pressure greater than 40 kPa (5.8 psia) as measured at 20°C (68°F);

b. —15°C (5°F) for VOCs with vapor pressure between 20 kPa (2.9 psia) and 40 kPa (5.8 psia) as measured at 20°C (68°F);

c. 0°C (32°F) for VOCs with vapor pressure between 10 kPa (1.5 psia) and 20 kPa (2.9 psia) as measured at 20°C (68°F);

d. 10°C (50°F) for VOCs with vapor pressure between 7 kPa (1.0 psia) and 10 kPa (1.5 psia) as measured at 20°C (68°F);

e. 25°C (77°F) for VOCs with vapor pressure between 3.5 kPa (0.5 psia) and 7 kPa (1.0 psia) as measured at 20°C (68°F).

2. Limit the VOC emissions from air dryer exhaust systems and production equipment exhaust systems to 15.0 kilograms per day (33 pounds per day) or to 10% of the uncontrolled emission rate of the system, whichever is less stringent.

3. Enclose all centrifuges, rotary vacuum filters, and any other filters having an exposed liquid surface, where the liquid contains VOCs and exerts a total VOC vapor pressure of 3.5 kPa (0.5 psia) or more at 20°C (68°F).

4. Install covers on all in-process tanks that contain a VOC at any time. Covers are to be closed except for necessary operator access during production, sampling, maintenance or inspection.

5. Repair all visually detectible leaks of liquid VOCs the first time the equipment is off-line for a period long enough to complete the repair.

(2) TRANSFER OF VOCS AT PHARMACEUTICAL MANUFACTURING FACILITIES. (a) *Applicability.* Subject to the provisions of s. NR 425.03, this subsection applies to all storage vessels for VOCs of more than 7,751 liter (2,000 gallon) capacity at a synthetic pharmaceutical manufacturing facility.

(b) *Emission reduction requirements.* No owner or operator of a synthetic pharmaceutical manufacturing facility may permit the delivery of VOCs with vapor pressure in excess of 28.0 kPa (4.1 psia) at 20°C from a truck or railcar to the storage vessel unless a vapor balance or equivalent

control system is provided. The system must be at least 90% effective in reducing emissions from transfer operations.

(3) STORAGE OF VOCs AT PHARMACEUTICAL MANUFACTURING FACILITIES. (a) *Applicability.* This subsection applies, subject to the provisions of s. NR 425.03, to all storage vessels for VOCs of more than 3,785 liters (1,000 gallon) capacity at synthetic pharmaceutical manufacturing facilities.

(b) *Storage requirements.* The owner or operator of any storage vessel shall install pressure-vacuum conservation vents set at ±0.2 kPa, or an equally effective control device approved by the department, on all storage vessels that store VOCs with vapor pressures in excess of 10.5 kPa (1.52 psia) at 21°C (70°F).

History: Renum. from NR 154.13 (2) (b), (3) (e) and (9) and am., Register, September, 1986, No. 369, eff. 10-1-86; am. (1) (b) 1. and (2) (b), Register, February, 1990, No. 410, eff. 3-1-90.

NR 421.04 Pneumatic rubber tire manufacture. (1) APPLICABILITY. This section applies, subject to the provisions of s. NR 425.03, to all pneumatic rubber tire manufacturing facilities involved in undertread cementing, tread end cementing, bead dipping, or green tire spraying operations.

(2) EXEMPTIONS. (a) This section does not apply to the production of specialty tires for antique or other vehicles when produced on an irregular basis or with short production runs. This exemption applies only to tires produced on equipment separate from normal production lines for passenger type tires.

(b) The requirements of sub. (3) do not apply provided the combined total VOC emissions from all undertread cementing, tread end cementing, bead dipping and green tire spraying operations are less than or equal to 57 grams per tire produced and the emission rates are determined and certified under sub. (4) by August 31, 1981.

(3) EMISSION CONTROL REQUIREMENTS. The owner or operator of a pneumatic rubber tire manufacturing facility shall:

(a) For all undertread cementing, tread end cementing and bead dipping operations install and operate:

1. A carbon adsorption system which reduces the VOC emissions from the capture system by at least 90% by weight;

2. An incineration or catalytic oxidation system which oxidizes at least 90% of the nonmethane VOCs (measured as total combustible carbon) which enter the incineration or oxidation unit, to non-organic compounds; or

3. An alternative VOC emission reduction system demonstrated to have at least 90% reduction efficiency measured across the control system, as approved by the department.

(b) For green tire spraying operations, implement one of following control strategies:

1. Utilize water-based mold release compound sprays with a volatile fraction containing, at a minimum, 90% water;

2. Install and operate a carbon adsorption system which reduces the VOC emission from the capture system by at least 90% by weight;

3. Install and operate an incineration or catalytic oxidation system which oxidizes at least 90% of the nonmethane VOCs (VOC measured as total combustible carbon) which enter the incinerator or oxidation unit to nonorganic compounds; or

4. Install and operate an alternate VOC emission reduction system demonstrated to have at least a 90% reduction efficiency, measured across the control system, as approved by the department.

(c) For any control device required by this section, install and operate a capture system, as approved by the department, which is designed to provide maximum reasonable capture and transfer of VOCs to the control device. Maximum reasonable capture and transfer shall be in accord with guidance provided by:

1. Industrial Ventilation: A Manual of Recommended Practices, 14th ed., and

2. Recommended Industrial Ventilation Guidelines.

Note: See Industrial Ventilation: A Manual of Recommended Practices, 14th ed., Committee on Industrial Ventilation, American Conference of Governmental Hygienists, 1976, (available from: Governmental Industrial Hygienists, P.O. Box 16153, Lansing, Michigan 48901) and U.S. Department of Health, Education and Welfare, National Institute of Occupational Safety and Health, Recommended Industrial Ventilation Guidelines, Springfield, VA: National Technical Information Service, PB 266 227, 1976. Copies of these documents are available for inspection in the offices of the department of natural resources, secretary of state and revisor of statutes, Madison, Wisconsin and may be obtained for personal use from the respective agencies listed above.

(4) EMISSIONS TESTING SCHEDULE. The owner or operator of a pneumatic rubber tire manufacturing facility may not exceed the following deadlines:

(a) Submit, by May 1, 1981, a plan for tests to measure VOC emissions from undertread cementing and tread end cementing operations. Any capture systems used for such tests shall be designed in accord with guidelines presented in sub. (3) (c).

(b) Commence construction of systems needed in order to measure emissions by June 15, 1981.

(c) Complete construction of equipment needed for testing and begin testing by July 1, 1981.

(d) Complete testing by July 31, 1981.

(e) Submit to the department documentation, including test results, of the actual combined total VOC emissions from all undertread cementing, tread end cementing, bead dipping and green tire spraying operations per tire produced by August 31, 1981.

History: Renum. from NR 154.13 (8) and am. (1), Register, September, 1986, No. 369, eff. 10-1-86; am. (4) (intro.), Register, February, 1990, No. 410, eff. 3-1-90.

NR 421.05 Synthetic resin manufacturing. (1) APPLICABILITY. Effective October 1, 1986, this section applies to reaction tanks, thinning tanks, blending tanks and other process vessels used in any synthetic resin manufacturing facility which has the potential to emit more than 100 tons of VOCs per year, with any emission control equipment inoperative, and

which is located in the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha.

(2) EMISSION CONTROL REQUIREMENTS. The owner or operator of a synthetic resin manufacturing facility shall:

(a) Equip each vent from reaction tanks, and all blending tanks and thinning tanks, with an emission control system which includes the following:

1. A surface condenser, or equally effective control device approved by the department, and a vapor recovery or control system that reduces emissions from the surface condenser or equally effective device by 85%, or

2. An equivalent system or approach demonstrated to reliably control emissions from a process that does not include a condenser by not less than 90% as approved by the department.

(b) If a surface condenser is used, prevent the condenser outlet gas temperature from exceeding 32°C (90°F).

(c) Enclose all centrifuges, rotary vacuum filters, and any other filters having an exposed liquid surface, where the liquid contains VOCs;

(d) Install covers on all in-process tanks that contain a VOC at any time. Covers shall be closed except for necessary operator access during production, sampling, maintenance or inspection;

(e) Monitor each valve, pump, sealed agitator, compressor, flange and relief valve used with a process stream which contains at least 10.0% VOCs by weight using Method 21 of Appendix A, 40 C.F.R. part 60, incorporated by reference in ch. NR 484. The monitoring schedule shall be as follows:

1. Monitor each valve, pump, sealed agitator, compressor, flange and relief valve that is located within 2.0 meters (6.6 feet) of a permanent support surface once during each calendar quarter.

2. Monitor all other valves, pumps, sealed agitators, compressors, flanges, and relief valves once during each calendar year.

(f) Check bimonthly by visual inspection each valve, pump, sealed agitator, compressor, flange and relief valve for indications of dripping liquid.

(g) Repair all leaks detected as soon as practicable, but not later than 15 calendar days after leak detection unless the repair is technically infeasible without a process unit shutdown. In the case of such infeasibility, repair shall occur before the end of the next process unit shutdown.

(h) Document to the department all repairs of detectable leaks of VOCs for each calendar quarter. This documentation is to include a description of the equipment that leaked, date of detection, date of repair, dates of follow-up inspection, and an explanation of what caused the leak. This documentation is to be submitted to the department within one month after the close of the calendar quarter during which the leaks were detected and repaired.

(3) COMPLIANCE REQUIREMENTS AND SCHEDULES. The owner or operator of a synthetic resin manufacturing facility shall comply with the following requirements:

(a) The owner or operator of a synthetic resin manufacturing facility which is in compliance with the emission control requirements and emission limitations of this section shall certify compliance to the satisfaction of the department within 90 days after October 1, 1986.

(b) The owner or operator of a synthetic resin manufacturing facility which commenced construction or commenced modification on or after October 1, 1986 shall meet the emission control requirements of this section upon startup unless the owner or operator demonstrates to the satisfaction of the department that compliance upon startup would be technologically infeasible. Such sources shall instead meet a department specified compliance schedule which provides for compliance with the emission control requirements of this section as soon as practicable but in no event later than the time period allowed for achieving final compliance under par. (c).

(c) The owner or operator of a synthetic resin manufacturing facility which proposes to comply with the requirements of this section by modification of existing processing or emission control equipment may not exceed the deadlines specified in the following increments of progress and final compliance date, as measured from October 1, 1986:

1. Submit final plans to the department for achieving compliance within 5 months.

2. Award contracts for equipment modifications or issue orders for the purchase of component parts to accomplish equipment modifications within 7 months.

3. Commence construction or installation of equipment modifications within 10 months.

4. Complete construction or installation of equipment modifications and achieve final compliance not later than December 31, 1987.

History: Cr. Register, September, 1986, No. 369, eff. 10-1-86; am. (1), (2) (a) 1. and b. and (b), (3) (b) and (c) 4., r. and recr. (2) (e), renum. (2) (f) to be (2) (h) and am., cr. (2) (f) and (g), r. (3) (c) 5., Register, February, 1990, No. 410, eff. 3-1-90.

NR 421.06 Coatings manufacturing. (1) APPLICABILITY. Effective October 1, 1986, this section applies to pigment dispersion chambers, thinning tanks, tinting, straining, blending tanks and other process vessels used in any coatings manufacturing facility which has the potential to emit more than 100 tons of VOCs per year, with any emission control equipment inoperative, and which is located in the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha.

(2) EMISSION CONTROL REQUIREMENTS. The owner or operator of a coatings manufacturing facility shall:

(a) Keep all portable mixing vats covered with lids, except to add ingredients or to take samples. The lids:

1. Shall extend at least ½ inch beyond the outer rim of the vat or be attached to the rim of the vat;

2. Shall be maintained in good condition such that, when in place, they maintain contact with the rim for at least 90% of the circumference of the rim of the vat; and

3. May have a slit to allow clearance for insertion of a mixer shaft. The slit shall be covered after insertion of the mixer, except to allow safe clearance for the mixer shaft.

(b) Keep all stationary vats covered, except to add ingredients or take samples;

(c) Clean all portable mixing vats, stationary vats, high speed dispersion mills, grinding mills, and roller mills in a way which minimizes the emissions of VOCs into the atmosphere and which is approved by the department;

(d) Equip any grinding mill installed after October 1, 1986 with fully enclosed screens;

(e) Monitor each valve, pump, sealed agitator, compressor, flange and relief valve used with a process stream which contains at least 10.0 percent VOCs by weight using Method 21 of Appendix A, 40 C.F.R. part 60, incorporated by reference in ch. NR 484. The monitoring schedule shall be as follows:

1. Monitor each valve, pump, sealed agitator, compressor, flange and relief valve that is located within 2.0 meters (6.6 feet) of a permanent support surface once during each calendar quarter.

2. Monitor all other valves, pumps, sealed agitators, compressors, flanges, and relief valves once during each calendar year.

(f) Check bimonthly by visual inspection each valve, pump, sealed agitator, compressor, flange and relief valve for indications of dripping liquid.

(g) Repair all leaks detected as soon as practicable, but not later than 15 calendar days after leak detection unless the repair is technically infeasible without a process unit shutdown. In the case of such infeasibility, repair shall occur before the end of the next process unit shutdown.

(h) Document to the department all repairs of detectable leaks of VOCs for each calendar quarter. This documentation is to include a description of the equipment that caused the leak, date of detection, date of repair, date of follow-up inspection, and an explanation of what caused the leak. This documentation is to be submitted to the department within one month after the close of the calendar quarter during which the leaks were detected and repaired.

(3) COMPLIANCE REQUIREMENTS AND SCHEDULES. The owner or operator of a coatings manufacturing facility shall comply with the following requirements:

(a) The owner or operator of a coatings manufacturing facility which is in compliance with the emission control requirements of this section shall certify compliance to the satisfaction of the department within 90 days after October 1, 1986.

(b) The owner or operator of a coatings manufacturing facility on which construction or modification commenced on or after October 1, 1986 shall meet the emission control requirements of this section upon startup unless the owner or operator demonstrates to the satisfaction of the department that compliance upon startup would be technologically infeasible. Such sources shall instead meet a department specified compliance schedule which provides for compliance with the emission control requirements of this section as soon as practicable but in no event later than the time period allowed for achieving final compliance under par. (c).

(c) The owner or operator of a coatings manufacturing facility which proposes to comply with the requirements of this section by modification of existing processing or emission control equipment may not exceed the deadlines specified in the following increments of progress and final compliance date, as measured from October 1, 1986:

1. Submit final plans to the department for achieving compliance within 5 months.

2. Award contracts for equipment modifications or issue orders for the purchase of component parts to accomplish equipment modifications within 7 months.

3. Commence construction or installation of equipment modifications within 10 months.

4. Complete construction or installation of equipment modifications and achieve final compliance not later than December 31, 1987.

History: Cr. Register, September, 1986, No. 369, eff. 10-1-86; am. (1) and (3) (c) 4., r. and recr. (2) (e), renum. (2) (f) to be (2) (h) and am., cr. (2) (f) and (g), r. (3) (c) 5., Register, February, 1990, No. 410, eff. 3-1-90.