

Chapter NR 423

CONTROL OF ORGANIC COMPOUND EMISSIONS FROM SOLVENT CLEANING OPERATIONS

NR 423.01 Applicability; purpose.
 NR 423.02 Definitions.
 NR 423.03 Solvent metal cleaning.

NR 423.035 Industrial cleaning operations — part 1.
 NR 423.037 Industrial cleaning operations — part 2.
 NR 423.05 Liquid VOC solvent dry cleaning.

Note: Corrections made under s. 13.93 c2md cbd 6. and 7., Stats., Register, December, 1996, No. 492.

NR 423.01 Applicability; purpose. c1d APPLICABILITY. This chapter applies to all solvent cleaning operation air contaminant sources and to their owners and operators.

c2d PURPOSE. This chapter is adopted under ss. 285.11, 285.13, and 285.17, Stats., to categorize organic compound emissions from solvent cleaning operations 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 423.02 Definitions. The definitions contained in chs. NR 400, 419, 420, and 421 apply to the terms used in this chapter. In addition, the following definitions apply to the terms used in this chapter:

c1gd XAerosol productY means solvent or solvent solution expelled by a propellant from a hand-held non-refillable pressurized container.

c1rd XBlanket or roller washY has the meaning given it in s. NR 422.02 c12d.

c2d XCartridge filterY means a perforated canister containing filtration paper or activated carbon, or both, that is used to remove solid particles and fugitive dyes from soil-laden solvent.

c5d XDry cleaning facilityY means any facility engaged in the cleaning of fabrics or leather in an essentially nonaqueous solvent by means of one or more washes in solvent, extraction of excess solvent by spinning, and drying by tumbling in an airstream. The facility includes but is not limited to any washer, dryer, filter and purification systems, waste disposal systems, holding tanks, pumps, and attendant piping and valves.

c5gd XElectrical apparatus componentY means an internal component such as wires, windings, stators, rotors, magnets, contacts, relays, energizers and connections in an apparatus that generates or transmits electrical energy including, but not limited to: alternators, generators, transformers, electric motors, cables and circuit breakers, except for the actual cabinet in which the components are housed. Electrical components of all rotogravure, letterpress, flexographic and lithographic application equipment and hot-line tools are also included in this category.

c5md XFlexible magnetic data storage discY means a flat, circular plastic film, contained in a non-rigid envelope, with a magnetic coating on which digital information can be stored by selective magnetization of portions of the flat surface.

c5rd XFlexographic printingY has the meaning given it in s. NR 422.02 c35d.

c6d XFreeboard heightY means, for a cold cleaner, the distance from the liquid solvent level in the degreaser tank to the lip

of the tank. For a vapor degreaser it means the distance from the top of the vapor zone to the lip of the degreaser tank.

c7d XFreeboard ratioY means the freeboard height divided by the internal width of the degreaser tank.

c7md XHot-line toolY means a specialized tool used primarily on the transmission systems, sub-transmission systems and distribution systems for replacing and repairing circuit components or for other types of work with electrically energized circuits.

c8cd XLetterpress printingY means the method in which the image area is raised relative to the non-image area and the ink is transferred directly from the ink roller to the plate cylinder.

c8gd XLithographic printingY has the meaning given it in s. NR 422.02 c48d.

c8pd XMedical deviceY means an instrument, apparatus, implement, machine, contrivance, implant, in vitro reagent or other similar article, including any component or accessory that meets any one of the following conditions:

cad It is intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment or prevention of disease.

cbd It is intended to affect the structure or function of the body.

ccd It is defined as a XdeviceY under 21 USC 321.

Note: Common examples of such medical devices include but are not limited to x-ray machines, medical lasers, diagnostic ultrasound products, thermometers, bedpans, artificial hearts, pacemakers, pregnancy test kits, scalpels, tongue depressors and bandages.

c8xd XOn-press componentY means a part, component or accessory of a press that is cleaned while still being physically attached to the press. Rollers, blankets, metering rollers, fountains, impression cylinders and plates are considered on-press components even when detached from the press.

c9d XRefrigerated freeboard chillerY means an emission control device which is mounted above the water jacket or primary condenser coils of a vapor degreaser and which consists of secondary coils carrying a refrigerant to provide a chilled air blanket above the solvent vapor.

c9gd XRemovable press componentY means a part, component or accessory of a press, excluding rollers, blankets, metering rollers, fountains, impression cylinders and plates, that is physically attached to the press but is disassembled and removed from the press prior to being cleaned.

c9td XRigid magnetic data storage discY means a flat, circular, non-flexible plate with a magnetic coating on which digital information can be stored by selective magnetization of portions of the flat surface.

c9wd XRotogravure printingY has the meaning given it in s. NR 422.02 c80d.

c10d XSolvent metal cleaningY means the process of cleaning soils from metal surfaces by cold cleaning, open top vapor degreasing, conveyORIZED degreasing or wipe cleaning.

c10gd XScreen printingY has the meaning given it in s. NR 422.02 c82d.

c10rd XSurface preparationY means the removal of contaminants such as dust, soil, oil, etc., prior to coating, adhesive or ink applications.

c11d XSolvent recovery dryerY means a dry cleaning dryer that employs a condenser to liquefy and recover solvent vapors evaporated in a closed-loop, recirculating stream of heated air.

c11gd XVOC composite partial vapor pressureY means the sum of the partial pressures of the compounds defined as VOCs and shall be calculated by one of the following equations:

$$P_{VOC} = \left[\frac{\sum_{i=1}^Q \left(\frac{W_i}{MW_i} \right)}{\frac{W_w}{MW_w} + \sum_{j=1}^K \left(\frac{W_{NVOCj}}{MW_{NVOCj}} \right) + \sum_{i=1}^Q \left(\frac{W_i}{MW_i} \right)} \right] P_{total}$$

or, if the total vapor pressure of the mixture is unknown

$$P_{VOC} = \left[\frac{\sum_{i=1}^Q \left(\frac{W_i VP_i}{MW_i} \right)}{\frac{W_w}{MW_w} + \sum_{j=1}^K \left(\frac{W_{NVOCj}}{MW_{NVOCj}} \right) + \sum_{i=1}^Q \left(\frac{W_i}{MW_i} \right)} \right]$$

where:

P_{VOC} is the VOC composite partial vapor pressure at 20vC cmm Hgd

W_i is the weight of the i th VOC compound ckilogramsd

MW_i is the molecular weight of the i th VOC compound ckilograms per kilogram moled

W_w is the weight of the water ckilogramsd

MW_w is the molecular weight of the water ckilograms per kilogram moled

W_{NVOCj} is the weight of the j th organic compound included in the VOC exclusion list in s. NR 400.02 c162d ckilogramsd

MW_{NVOCj} is the molecular weight of the j th organic compound included in the VOC exclusion list in s. NR 400.02 c162d ckilograms per kilogram moled

P_{total} is the total vapor pressure of the mixture at 20vC cmm Hgd

VP_i is the vapor pressure of i th VOC compound at 20vC cmm Hgd

c11rd XVOC contentY means the weight of VOC per volume of solvent or solvent solution and shall be calculated by the following equation:

$$VOC \text{ content} = \left[\frac{W_s - W_w - W_{NVOC}}{V_s} \right]$$

where:

VOC content is in kilograms of VOC per liter of solvent or solvent solution cpounds per gallond

W_s is the weight of solvent or solvent solution in kilograms cpoundsd

W_w is the weight of water in kilograms cpoundsd

W_{NVOC} is the weight of organic compounds included in the VOC exclusion list in s. NR 400.02 c162d in kilograms cpoundsd

V_s is the volume of solvent or solvent solution in liters cgallonsd

c12d XWipe cleaningY means the cleaning and removing of soils from the metal surfaces of a product or product component

by manually wiping the surfaces with solvent using a porous applicator while maintaining the solvent below its boiling point.

History: Renum. from NR 154.01, Register, September, 1986, No. 369, eff. 10-1-86; cr. c3md, am. c4d, Register, January, 1987, No. 385, eff. 2-1-88; renum. c9d and c10d to be c10d and c11d and am. c10d, cr. c9d and c12d, Register, August, 1994, No. 464, eff. 9-1-94; am. cintro.d, Register, December, 1995, No. 480, eff. 1-1-96; renum. c3d, c3md, c4d and c8d to be NR 400.02 c22vd, c26od, c26qd and c60sd; cr. c1d, c1gd, c1rd, c5gd, c5rd, c7md, c8d to c8xd, c9cd to c9wd, c10gd, c10rd, c11gd and c11rd, Register, January, 2001, No. 541, eff. 2-1-01; CR 08-102: cr. c5md and c9td Register July 2009 No. 643, eff. 8-1-09; CR 11-005: renum. c1d, c8d, c8Ld, c8td, c9cd, c9nd, c9rd to be NR 400.02 c26md, c85md, c93md, c107md, c133ed, c133md, c133sd Register January 2012 No. 673, eff. 2-1-12.

NR 423.03 Solvent metal cleaning. c1d APPLICABILITY. Except as provided in sub. c8d, this section applies, with a final compliance deadline of May 1, 1980, or as provided by a compliance schedule issued or approved pursuant to s. NR 425.03 c5d, to cold cleaning, open top vapor degreasing and conveyORIZED vapor degreasing operations. This section also applies, with a final compliance deadline of May 1, 1988, except as provided in sub. c8d, to conveyORIZED non-vapor degreasing operations and, under the compliance provisions of sub. c8d ccd, to wipe cleaning operations.

Note: Owners and operators of solvent cleaning operations should refer to sub. c2d chd and cid and ch. NR 469.

c2d EXEMPTIONS. The owner or operator of any facility located in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and which claims to be exempt under this subsection from any requirement of subs. c3d to c7d shall comply with the recordkeeping requirements of sub. c10d. The following exemptions apply to the source categories indicated:

cad This section does not apply to individual cold cleaners to which not more than 5.7 liters c1.5 gallonsd of solvent is added per day, or to individual open top vapor, conveyORIZED vapor or conveyORIZED non-vapor degreasers whose emissions of VOCs are not more than 6.8 kilograms c15 poundsd in any one day provided the following conditions are met:

1. The degreaser is located outside the counties of Brown, Calumet, Dane, Dodge, Door, Fond du Lac, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha, and Winnebago.

2. The emission rates from open top vapor and conveyORIZED vapor degreasers are determined and certified before October 1, 1979 in a manner approved by the department, and the emission rates from conveyORIZED non-vapor degreasers are determined and certified before May 1, 1988 in a manner approved by the department.

cbd This section also does not apply to sources used exclusively for chemical or physical analysis or determination of product quality and commercial acceptance where all of the following conditions are met:

1. The operation of the source is not an integral part of the production process.

2. The emissions from the source do not exceed 363 kilograms c800 poundsd in any calendar month.

3. The exemption is approved in writing by the department.

ccd An individual cold cleaner which is:

1. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties and which has an open area smaller than 0.10 square meter c1.1 square feetd is exempt from the requirements of sub. c3d cbd to cgd.

2. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Wauke-

sha counties is exempt from the requirements of sub. [c3d chd](#), [cid](#) and [cjd](#).

3. Located inside Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and which has an open area smaller than 0.10 square meter c1.1 square feetd, and to which not more than 5.7 liters c1.5 gallonsd of solvent is added per day, is exempt from the requirements of sub. [c3d cbd](#) to [cjd](#).

cdd An individual open top vapor degreaser which is:

1. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties and which has an open area smaller than 1.0 square meter c10.8 square feetd is exempt from the requirements of sub. [c4d ccd](#).

2. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties is exempt from the requirements of sub. [c4d cnd](#) to [cqd](#).

3. Located inside Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and which has an open area smaller than 1.0 square meter c10.8 square feetd, and whose emissions of VOCs are not more than 6.8 kilograms c15 poundsd in any one day, is exempt from the requirements of sub. [c4d ccd](#), [cnd](#), [cod](#) and [cpd](#).

ced An individual conveyORIZED vapor degreaser which is:

1. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties and which has an open area smaller than 2.0 square meters c21.6 square feetd is exempt from the requirements of sub. [c5d ccd](#).

2. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties is exempt from the requirements of sub. [c5d chd](#), [cid](#), and [cjd](#).

3. Located inside Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and which has an open area smaller than 2.0 square meters c21.6 square feetd, and whose emissions of VOCs are not more than 6.8 kilograms c15 poundsd in any one day, is exempt from the requirements of sub. [c5d ccd](#).

cf An individual conveyORIZED non-vapor degreaser which is:

1. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties and which has a total horizontal solvent-air interface smaller than 2.0 square meters c21.6 square feetd, where such an interface exists, is exempt from the requirements of sub. [c6d cad](#) 2.

2. Located outside of Brown, Calumet, Dane, Dodge, Door, Fond du Lac, Jefferson, Kenosha, Kewaunee, Manitowoc, Milwaukee, Outagamie, Ozaukee, Racine, Rock, Sheboygan, Walworth, Washington, Waukesha, and Winnebago counties is exempt from sub. [c6d cad](#) 2.

3. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties is exempt from the requirements of sub. [c6d cad](#) 8, and 9.

4. Located inside Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and which has an open area smaller than 2.0 square meters c21.6 square feetd, and whose emissions of VOCs are not more than 6.8 kilograms c15 poundsd in any one day, is exempt from the requirements of sub. [c6d cad](#) 2.

cg An individual wipe cleaning operation which is:

1. Located outside of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties is exempt from the requirements of this section.

2. Located inside Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and whose emissions of VOCs are not more than 6.8 kilograms c15 poundsd in any one day is exempt from the requirements of sub. [c7d cdd](#).

ch This section does not apply to solvent metal cleaning operations using only cleaning solvents that have a VOC content of 2.0% or less by volume.

cid This section does not apply to any individual cold cleaning, batch vapor degreasing or conveyORIZED degreasing operation that is subject to ch. [NR 469](#).

c3d COLD CLEANERS. Except as provided under sub. [c2d cad](#), [cbd](#), [ccd](#), [chd](#) and [cid](#), the owner or operator of a cold cleaning facility shall do all of the following:

cad Equip the cleaner with a cover.

cbd Design the cover so that it can be easily operated with one hand if any of the following applies:

1. The solvent volatility is greater than 2 kPa c0.3 psiad measured at 38vC c100vFd.

2. The solvent is agitated.

3. The solvent is heated.

ccd Equip the cleaner with a facility for draining cleaned parts, and the drainage facility shall be constructed internally so that parts are enclosed under the cover while draining if the solvent volatility is greater than 4.3 kPa c0.6 psiad measured at 38vC c100vFd, except that the drainage facility may be external for applications where an internal type cannot fit into the cleaning system.

cdd Install one of the following control devices if the solvent volatility is greater than 4.3 kPa c0.6 psiad measured at 38vC c100vFd, or if the solvent is heated above 49vC c120vFd:

1. Freeboard that gives a freeboard ratio greater than or equal to 0.70.

2. Water cover csolvent must be insoluble in and heavier than waterd.

3. Other systems of equivalent control, such as refrigerated chiller or carbon adsorption, approved by the department.

ced If used, supply a solvent spray that is a solid fluid stream cnot a fine, atomized or shower type sprayd at a pressure which does not cause extensive splashing.

cf Provide a permanent, conspicuous label, summarizing the operating requirements.

cg Provide supervision or instruction adequate to ensure that the operation is conducted in accord with all of the following:

1. Close the cover whenever parts are not being handled in the cleaner.

2. Drain the cleaned parts for at least 15 seconds or until dripping ceases.

3. Store waste solvent only in covered containers and not dispose of waste solvent or transfer it to another person in such a way as to cause greater than 15% of the waste solvent, by weight, to evaporate into the ambient air during the ozone season, s. [NR 419.04](#) notwithstanding.

4. Repair solvent leaks immediately, or shut down the degreaser until the leaks are repaired.

ch Design the cover so that it is either a roll-top cover, a canvas curtain cover, a guillotine cbipartingd cover, or any other type of cover that slides off the degreaser in a horizontal motion and is designed such that it can be opened or closed without disturbing

the vapor layer or the solvent surface if any of the following applies:

1. The solvent volatility is greater than 2 kPa c0.3 psia measured at 38°C c100°Fd.

2. The solvent is agitated.

3. The solvent is heated.

cid If freeboard is chosen as a control device under par. cdd, design or modify the freeboard to give a freeboard ratio greater than or equal to 1.0.

cjd If a system of equivalent control is chosen under par. cdd 3., the level of control shall be equivalent to that achieved under a freeboard ratio of 1.0.

c4d OPEN TOP VAPOR DEGREASERS. Except as provided under sub. c2d cad, cbd, cdd, chd, and cid, the owner or operator of an open top vapor degreaser shall do all of the following:

cad Equip the vapor degreaser with a cover that can be opened and closed easily without disturbing the vapor zone.

cbd Provide the following safety switches:

1. A condenser flow switch or other switching system which shuts off the sump heat if the condenser coolant is either not circulating or too warm.

2. A thermostatically activated control switch which shuts off the sump heat when the vapor level rises above the upper boundary of the normal range.

3. A spray safety switch which shuts off the spray pump if the vapor level does not stay within the normal range.

ccd Install and use one of the following control devices:

1. Except when par. cod applies, a freeboard ratio equal to or greater than 0.75 for all degreasers, with a powered or mechanically assisted cover for any degreaser with an opening which is greater than 1.0 square meter c10.8 square feetd.

2. Refrigerated freeboard chiller.

3. Enclosed design ccover or door opens only when the dry part is actually entering or exiting the degreaserd.

4. Ventilation greater than or equal to 15 cubic meters per minute per square meter c50 cubic feet per minute per square footd of air-vapor area cwhen cover is opened, all passing through a carbon adsorption system which exhausts less than 25 parts per million of solvent averaged over one complete adsorption cycle.

5. A control system demonstrated to have control efficiency equivalent to or greater than any of subs. 1. to 4. and approved by the department.

cdd Position any ventilation fans so that they do not disturb the degreaser[s vapor zone, and limit exhaust ventilation to 20 cubic meters per minute per square meter c65 cubic feet per minute per square footd of degreaser open area during the ozone season, unless a higher exhaust rate is necessary to meet OSHA requirements.

ced Keep the cover closed at all times except when processing workloads through the degreaser.

cfid Always spray below the vapor level.

cgd Minimize solvent carryout by doing all of the following:

1. Racking parts to allow complete drainage.

2. Moving parts in and out of the degreaser at less than 3.3 meters per minute c11 feet per minuted.

3. Holding the parts in the vapor zone at least 30 seconds or until condensation ceases.

4. Tipping out any pools of solvent on the cleaned parts before removal from the vapor zone.

5. Allowing parts to dry within the degreaser for at least 15 seconds or until visually dry.

chd Prevent porous or absorbent materials, such as cloth, leather, wood, or rope, from entering the degreaser.

cid Move parts in and out of the degreaser at less than 1.5 meters per minute c4.9 feet per minuted if the workload occupies more than 50% of the degreaser[s open top area.

cjd Except where a load cannot be divided, avoid loading the degreaser to the point where the vapor level would drop more than 10 centimeters c4 inchesd when the workload is placed in the vapor zone.

ckd Operate the degreaser in a manner that prevents water from being visually detectable in solvent exiting the water separator.

cLd Follow the requirements of sub. c3d cgd 3. and 4.

cmd Provide a permanent, conspicuous label, summarizing the operating procedures of pars. ced to cid, and cqj if applicable, and provide supervision or instruction adequate to ensure that the procedures are followed.

cnd Equip the vapor degreaser with an enclosed design, such that the cover or door opens only when the dry part is actually entering or exiting the degreaser, that is either a roll-top cover, a canvas curtain cover, a guillotine cbi-partingd cover, or any other type of cover that slides off the degreaser in a horizontal motion and is designed such that it can be opened or closed without disturbing the vapor layer or the solvent surface, and if the degreaser opening is greater than 2.0 square meters c21.6 square feetd, then design the cover to be an automated, powered or mechanically assisted sliding cover.

cod Under par. ccd, if par. ccd 1. is chosen, design or modify the freeboard to give a freeboard ratio equal to or greater than 1.0.

cpd If a system of equivalent control is chosen under par. ccd 5., the level of control shall be equivalent to that achieved under a freeboard ratio of 1.0.

cqd At startup, turn on the refrigerated condenser and the refrigerated freeboard chiller either simultaneously with or before turning on the sump heater. At shutdown, turn off the sump heater either simultaneously with or before turning off the refrigerated condenser and refrigerated freeboard chiller.

c5d CONVEYORIZED VAPOR DEGREASERS. Except as provided under sub. c2d cad, cbd, ced, chd, and cid, the owner or operator of a conveyORIZED vapor degreaser shall do all of the following:

cad Minimize entrance and exit openings during operation so that no opening dimension exceeds the smallest physically possible by more than 20 centimeters c8 inchesd or by more than 20% of the opening dimension, whichever is smaller.

cbd Provide the following safety switches:

1. A condenser flow switch or other switching system which shuts off the sump heat if the condenser coolant is either not circulating or too warm.

2. A thermostatically activated control switch which shuts off the sump heat when the vapor level rises above the upper boundary of the normal range.

3. A spray safety switch which shuts off the spray pump or the conveyor if the vapor level does not stay within the normal range.

ccd Install and use one of the following control devices:

1. Refrigerated freeboard chiller.

2. Carbon adsorption system, with ventilation greater than or equal to 15 cubic meters per minute per square meter c50 cubic feet per minute per square footd of air-vapor area cwhen down-time covers are opened, and exhausting less than 25 parts per million of solvent by volume averaged over a complete adsorption cycle.

3. A system demonstrated to have a control efficiency equivalent to or greater than subd. 1. or 2. and approved by the department.

cdd Provide downtime covers for closing off the entrance and exit during shutdown hours.

ced Place downtime covers over entrances and exits of conveyorized vapor degreasers immediately after the conveyors and exhausts are shut down and not remove them until just before startup.

cfđ Minimize carryout emissions by doing all of the following:

1. Using a drying tunnel, rotating tumbling basket or their equivalent.

2. Racking parts for best drainage.

3. Maintaining the vertical conveyor speed at less than 3.3 meters per minute c11 feet per minute.

cgd Follow the requirements of subs. **c3d cgd 3.** and **4.** and **c4d cdd** and **ckd**.

chđ Minimize entrance and exit openings during operation so that no opening dimension exceeds the smallest physically possible by more than 10 centimeters c4 inches or by more than 10% of the opening dimension, whichever is smaller.

cid At startup, turn on the refrigerated condenser and the refrigerated freeboard chiller either simultaneously with or before turning on the sump heater. At shutdown, turn off the sump heater either simultaneously with or before turning off the refrigerated condenser and refrigerated freeboard chiller.

cjd Provide a permanent, conspicuous label summarizing the operating procedures of pars. **ced** to **cid**, and provide supervision or instruction adequate to ensure that the procedures are followed.

c6đ CONVEYORIZED NON-VAPOR DEGREASERS. **cad** *Control requirements.* Except as provided under sub. **c2đ cad, cbd, cfđ, chđ,** and **cid**, the owner or operator of a conveyorized non-vapor degreaser shall do all of the following:

1. Minimize entrance and exit openings during operation so that no opening dimension exceeds the smallest physically possible by more than 20 centimeters c8 inches or by more than 20% of the opening dimension, whichever is smaller.

2. Install and operate one of the following control systems:

a. A carbon adsorption system demonstrated to have at least a 95% control efficiency, as measured across the carbon adsorption equipment and averaged over a complete adsorption cycle.

b. A system, demonstrated to have a control efficiency equivalent to or greater than that described in subd. 2. a., and approved by the department.

3. Provide downtime covers for closing off the entrance and exit during shutdown hours.

4. Place downtime covers over the entrances and exits of conveyorized non-vapor degreasers immediately after the conveyors and exhausts are shut down and not remove them until just before startup.

5. Minimize carryout emissions by:

a. Use of rollers to remove excess solvent in strip cleaning operations.

b. Arranging parts for best drainage in mesh belt cleaning operations and other conveyorized non-vapor degreasing operations.

6. Store waste solvent in covered containers and not dispose of waste solvents or transfer it to another person in such a way as to cause greater than 15% of the waste solvent, by weight, to evaporate into the ambient air during the ozone season.

7. Repair solvent leaks immediately, or shut down the degreaser and drain it of all solvent until the leaks are repaired.

8. Minimize entrance and exit openings during operation so that no opening dimension exceeds the smallest physically possible by more than 10 centimeters c4 inches or by more than 10% of the opening dimension, whichever is smaller.

9. Provide a permanent, conspicuous label, summarizing the operating procedures of subs. 4. to 7., and provide supervision or instruction adequate to ensure that the procedures are followed.

cbd *Compliance schedule.* The owner or operator of a conveyorized non-vapor degreaser subject to the control requirements of par. **cad 2.** shall achieve final compliance on or before May 1, 1988.

c7đ WIPE CLEANING. Except as provided under sub. **c2đ cbd, cgd,** and **chđ,** the owner or operator of a wipe cleaning operation shall do all of the following:

cad Immediately after use, place all rags, or any other porous materials used to apply solvent, in a covered container that is labeled as waste solvent, and handled in accordance with local, state and federal regulations.

cbd Store waste solvent only in covered containers labeled as waste solvent and handled in accordance with local, state and federal regulations.

ccd Follow operating procedures which prevent solvent from dripping from the applicator during solvent application.

cdd Install and operate one of the following emission control systems:

1. A vapor collection system that includes a carbon adsorption system demonstrated to have at least a 90% capture efficiency, and a 90% control efficiency as measured across the carbon adsorption equipment and averaged over a complete adsorption cycle.

2. Use of a solvent with a volatility of less than 2 kPa c0.3 psiad measured at 38°C c100°Fd.

3. A system demonstrated to have a control efficiency equivalent to or greater than that described in subd. 1. or 2. and approved by the department.

ced Provide a permanent, conspicuous label, summarizing the operating procedures of pars. **cad** to **ccd**, and provide supervision or instruction adequate to ensure that the procedures of pars. **cad** to **ccd** are followed.

c8đ COMPLIANCE SCHEDULE. This subsection applies only to facilities located in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties.

cad *Previously regulated operations.* 1. This paragraph applies only to a facility which is in existence on September 1, 1994 and which:

a. Prior to September 1, 1994 was subject to all requirements of sub. **c3đ, c4đ, c5đ,** or **c6đ.**

b. Is subject to sub. **c3đ chđ, cid,** or **cjd, c4đ cnd** to **cqd, c5đ chđ, cid** or **cjd,** or **c6đ cad 8.** or **9.** as of September 1, 1994.

2. The owner or operator of any source identified under subd. 1. shall:

a. Remain in compliance with all requirements of sub. **c3đ, c4đ, c5đ,** or **c6đ** to which the owner or operator was subject prior to September 1, 1994.

b. Achieve final compliance with the requirements of sub. **c3đ chđ, cid,** or **cjd, c4đ cnd** to **cqd, c5đ chđ, cid,** or **cjd,** or **c6đ cad 8.** or **9.** as soon as practicable, but no later than May 15, 1995.

cbd *Previously exempt operations.* 1. This paragraph applies only to a facility which is in existence on September 1, 1994 and which is subject to requirements under sub. c3d cbd to cgd, c4d ccd, c5d ccd, or c6d cad 2. as of September 1, 1994 and which prior to September 1, 1994 was exempt from the requirements of sub. c3d cbd to cgd under sub. c2d ccd, from the requirements of sub. c4d ccd under sub. c2d cdd, from the requirements of sub. c5d ccd under sub. c2d ced, or from the requirements of sub. c6d cad 2. under sub. c2d cfd.

2. The owner or operator of any source identified under subd. 1. shall achieve final compliance with the applicable requirements as soon as practicable, but no later than September 15, 1995.

ccd *Wipe cleaning operations.* 1. This paragraph applies only to a facility which is in existence on September 1, 1994 and which is subject to the requirements of sub. c7d as of September 1, 1994.

2. The owner or operator of any source identified under subd. 1. shall achieve final compliance with the requirements of sub. c7d as soon as practicable, but no later than May 15, 1996.

c9d EQUIVALENT CONTROL. Any equivalent control system approved by the department under sub. c3d cdd 3. or cjd, c4d ccd 5. or cpd, c5d ccd 3., c6d cad 2. b., or c7d cdd 3. shall be submitted to, and will not become effective for federal purposes until approved by, the administrator as a source-specific revision to the department's state implementation plan for ozone.

c10d RECORDKEEPING. This subsection applies only to facilities located in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county. As of September 1, 1994, each owner or operator of a degreasing operation that is exempt from the requirements of subs. c3d to c7d, under sub. c2d ccd to cgd, shall collect and record the information specified in this paragraph, as appropriate to support the exemption. The following information shall be maintained on the facility premises for a minimum of 3 years and shall be made available upon request to an authorized department representative at any time during normal working hours:

cad A unique name or identification number for each degreaser or wipe cleaning operation.

cbd The volume of solvent used or added per day for each individual degreaser or wipe cleaning operation, in units of gallons.

ccd The VOC emissions, in units of pounds or kilograms per day, from each individual degreaser or wipe cleaning operation.

cdd The density of the solvent used, in units of pounds per gallon.

ced The VOC content of the solvent, expressed as percent by volume.

History: Renum. from NR 154.13 c6d cad and am. Register, September, 1986, No. 369, eff. 10-1-86; am. c1d, c2d cad cintro.d, 2. and ced, c5d cintro.d and ced, cr. c2d cfd and c6d, Register, January, 1988, No. 385, eff. 2-1-88; am. c2d cad cintro.d and ced and c3d cdd 1., Register, February, 1990, No. 410, eff. 3-1-90; am. c2d cad 1. and cfd, a. c7d, Register, December, 1993, No. 456, eff. 1-1-94; am. c1d, c2d cad cintro.d, c3d cad cintro.d and cgd 4., c4d cintro.d, ced 2., cid and cmd, c5d cintro.d, ced 1. and cgd, c6d cad cintro.d and 7., renum. c7d to be c9d and am., cr. c2d cintro.d, cgd, chd, c3d chd to cjd, c4d end to cqd, c5d chd to cjd, c6d cad 8. and 9., c7d, c8d and c10d, r. and recr. c2d ced to cfd, Register, August, 1994, No. 464, eff. 9-1-94; am. c4d cad cintro.d and cmd, c5d cintro.d, c6d cad cintro.d and cbd cintro.d and c9d, r. c6d cbd 1. to 5., Register, December, 1995, No. 480, eff. 1-1-96; am. c1d, c2d cintro.d, cad cintro.d, cbd cintro.d, c3d cintro.d, cbd cintro.d, cgd cintro.d, chd cintro.d, c4d cgd cintro.d, c5d cfd cintro.d, c6d cad cintro.d, c7d cintro.d, c8d cbd 1. cintro.d, r. c8d cbd 1. a. to d., Register, December, 1996, No. 492, eff. 1-1-97; cr. c2d cid and am. c3d cintro.d, c4d cintro.d, c5d cintro.d and c6d cad cintro.d, Register, March, 1997, No. 495, eff. 4-1-97; am. c2d cgd 2., c4d ccd cintro.d, 1., cdd, chd, ckd, c5d ccd cintro.d and c7d ced, Register, October, 1999, No. 526, eff. 11-1-99.

NR 423.035 Industrial cleaning operations — part

1. c1d APPLICABILITY. cad Except as provided in subs. c2d and c9d cad, this section applies to industrial cleaning operations at facilities that are located in Kenosha, Milwaukee, Ozaukee,

Racine, Washington, or Waukesha county and have maximum theoretical emissions of VOCs from the facility, excluding any maximum theoretical emissions of VOCs resulting from combustion, or VOCs specifically subject to s. NR 419.05, 419.06, or 419.08, ch. NR 420, 421, or 422, or s. NR 423.03, 423.05, 424.04, or 424.05, of 25 tons per year or more.

Note: To determine the maximum theoretical emissions of VOCs from a facility, excluding any maximum theoretical emissions of VOCs specifically subject to the cited provisions, use the following procedure.

1. Calculate the maximum theoretical emissions of VOCs from the facility excluding emissions from combustion.

2. Calculate the maximum theoretical emissions of VOCs from the facility subject to s. NR 419.05, 419.06, or 419.08, ch. NR 420, 421 or 422, or s. NR 423.03, 423.05, 424.04, or 424.05.

3. Subtract the emissions calculated in step 2 from the emissions calculated in step 1.

4. If the quantity calculated in step 3 is less than 25 tons per year, then the only requirements of this section that apply to the facility are the recordkeeping requirements of sub. c9d cad.

cbd Except as provided in subs. c2d and c9d cad, this section applies to industrial cleaning operations at facilities that are located in Kewaunee, Manitowoc, or Sheboygan county and have maximum theoretical emissions of VOCs from the facility, excluding any maximum theoretical emissions of VOCs resulting from combustion, or VOCs specifically subject to s. NR 419.05, 419.06, or 419.08, ch. NR 420, 421, or 422, or s. NR 423.03, 423.05, 424.04, or 424.05, of 100 tons per year or more.

Note: To determine the maximum theoretical emissions of VOCs from a facility, excluding any maximum theoretical emissions of VOCs specifically subject to the cited provisions, use the following procedure.

1. Calculate the maximum theoretical emissions of VOCs from the facility excluding emissions from combustion.

2. Calculate the maximum theoretical emissions of VOCs from the facility subject to s. NR 419.05, 419.06, or 419.08, ch. NR 420, 421 or 422, or s. NR 423.03, 423.05, 424.04, or 424.05.

3. Subtract the emissions calculated in step 2 from the emissions calculated in step 1.

4. If the quantity calculated in step 3 is less than 100 tons per year, then the only requirements of this section that apply to the facility are the recordkeeping requirements of sub. c9d cad.

c2d EXEMPTIONS. If any exemption in this subsection is based on an exemption threshold and that threshold is exceeded, the exemption will no longer apply to the facility. The following exemptions are applicable to various provisions of this section:

cad This section does not apply to:

1. Operations regulated under s. NR 421.05 c2md, 421.06 c2md, 422.05 c3d, 422.06 c3d, 422.075 c3d, 422.08 c3d, 422.083 c3md, 422.09 c6d, 422.095 c7d, 422.105 c5d, 422.115 c5d, 422.125 c4md, 422.127 c3md, 422.128 c7d, 422.131 c3d, 422.14 c4d, 422.141 c3d, 422.142 c2d ccd, 422.143 c3d ccd and c4d, 422.144 c4d cbd and c5d, 422.145 c2md, 422.15 c9d, 422.155 c5d, or 423.03.

2. Stripping of cured coatings, cured inks or cured adhesives.

3. Cleaning operations in graphic arts pre-press areas including the cleaning of film processors, color scanners or plate processors, or film cleaning and plate cleaning.

cbd Subsection c3d does not apply to any of the following activities or facilities:

1. Cleaning conducted in conjunction with performance laboratory tests on coatings, adhesives or inks; research and development programs; and laboratory tests in quality assurance laboratories.

2. Cleaning of electrostatic printing and coating application equipment.

3. Medical device and pharmaceutical manufacturing facilities using less than a total of 1.5 gallons per day of VOC-containing solvents and solvent solutions for industrial cleaning operations.

4. Facilities whose aggregate use of solvent and solvent solutions which do not comply with the applicable VOC content lim-

its in sub. [c3d](#) and of any coatings and inks exempt under s. [NR 422.03 c7d](#) does not exceed 55 gallons during any 12 consecutive months at the facility.

[ccd](#) Subsections [c3d](#) and [c7d](#) do not apply to cleaning with aerosol product if 160 fluid ounces or less of VOC-containing aerosol product are used per day for industrial cleaning operations, per facility.

[cdd](#) Subsection [c7d](#) does not apply to cleaning with solvents or solvent solutions in spray bottles or containers described in sub. [c4d cbd](#).

[ced](#) Subsection [c7d](#) does not apply to the cleaning of the nozzle tips of automated spray equipment systems, except for robotic systems that are programmed to spray into a closed container.

[cfd](#) Subsection [c7d](#) does not apply to automatically applied blanket or roller wash.

[cgd](#) Subsections [c4d](#) to [c8d](#) do not apply to cleaning which uses solvents or solvent solutions containing no more than 0.05 kilograms of VOC per liter.

[chd](#) Subsections [c3d](#), [c6d](#), [c7d](#), and [c8d](#) do not apply to digital printing.

c3d SOLVENT AND SOLVENT SOLUTION REQUIREMENTS. Except as provided under sub. [c6d](#), no owner or operator of a facility may cause, allow or permit the use of a solvent or solvent solution for industrial cleaning operations on and after January 1, 2002 unless the VOC content of the solvent or solvent solution is less than or equal to the applicable VOC content listed in Table 1 for the respective cleaning operation.

Table 1
VOC Content Limits for Solvents and Solvent Solutions Used in Industrial Cleaning Operations

Cleaning Activity	VOC Content of Solvent or Solvent Solution in kilograms per liter or pounds per gallon
cad Product cleaning during manufacturing process or surface preparation for coating, adhesive or ink application	
1. General	0.05 c0.42d
2. Electrical apparatus components and electronic components	0.50 c4.2d
3. Laminated wood products — removal of contact adhesives	
a. General	0.46 c3.8d
b. Polyvinylchloride surfaces	0.70 c5.8d
4. Medical devices and pharmaceuticals	0.80 c6.7d
5. Screen printing] removal of adhesives from plastic substrates	0.77 c6.4d
cbd Repair and maintenance cleaning	
1. General	0.05 c0.42d
2. Electrical apparatus components and electronic components	0.90 c7.5d
3. Medical devices and pharmaceuticals	
a. Tools, equipment and machinery	0.80 c6.7d
b. General work surfaces	0.60 c5.0d
4. Screen printing] removal of oils and adhesives from cutting dies	0.55 c4.6d
ccd Cleaning of coatings application equipment or adhesives application equipment	
1. General	0.55 c4.6d
2. Architectural coatings	0.95 c7.9d
3. Ultraviolet coatings	0.80 c6.7d
cdd Cleaning of ink application equipment	
1. General	0.05 c0.42d
2. Flexographic printing	
a. General	0.05 c0.42d
b. Plastics, coated papers and metal foils	0.89 c7.4d
3. Rotogravure printing	
a. Publication	0.75 c6.3d
b. Packaging	0.05 c0.42d
4. Lithographic or letterpress printing	
a. On-press components	*
b. Removable press components	0.05 c0.42d
5. Screen printing	0.77 c6.4d
6. Ultraviolet ink application equipment cexcept screen printingd	0.80 c6.7d
ced Cleaning of polyester resin application equipment	0.05 c0.42d

* A maximum VOC content of 30% by weight.

c4d CLEANING DEVICES AND METHODS REQUIREMENTS. Except as provided under sub. **c6d**, on or after January 1, 2002, the owner or operator of a facility shall comply with the following requirements associated with the identified cleaning devices or methods when using solvents or solvent solutions:

cad Physically rub a surface with a porous applicator such as a rag, paper, sponge, or a cotton swab moistened with solvent or solvent solution.

cbd Closed containers or hand held spray bottles from which solvents or solvent solutions are applied without a propellant-induced force.

ccd Cleaning equipment which has a solvent or solvent solution container that is closed during cleaning operations, except when depositing and removing objects to be cleaned, and is closed during non-operation with the exception of maintenance and repair to the cleaning equipment itself.

ccd A remote reservoir cleaner operated in compliance with all of the following requirements:

1. Solvent vapors are prevented from escaping from the solvent or solvent solution container by using devices such as a cover or a valve when the remote reservoir is not being used, cleaned, or repaired.

2. Flow is directed in a manner that prevents solvent or solvent solution from splashing outside of the remote reservoir cleaner.

3. The cleaner is not used for cleaning porous or absorbent materials, such as cloth, leather, wood, or rope.

4. Only solvent or solvent solution containers free of all liquid leaks are used. Auxiliary equipment, such as pumps, pipelines or flanges, may not have any liquid leaks, visible tears, or cracks. Any liquid leak, visible tear, or crack detected shall be repaired within one calendar day, or the leaking section of the remote reservoir cleaner shall be drained of all solvents or solvent solutions and shut down until it is replaced or repaired.

ced A non-atomized flow method where the used solvents or solvent solutions are collected in a container or a collection system which is closed, except for the solvent or solvent solution collection openings that may be open when filling or emptying, or the opening caused by use of a pressure relief valve.

cfid A flushing method where the used solvents or solvent solutions are discharged into a container which is closed, except for the solvent or solvent solution collection openings that may be open when filling or emptying, or the opening caused by use of a pressure relief valve. The discharged solvents or solvent solutions shall be collected into containers without atomizing into the open air.

c5d STORAGE AND DISPOSAL. The owner or operator of a facility shall store all solvents or solvent solutions used in industrial cleaning operations in non-absorbent, non-leaking containers which shall be kept covered except when filling or emptying. Cloth and paper moistened with solvents or solvent solutions shall be stored in covered, non-absorbent, non-leaking containers.

c6d CONTROL EQUIPMENT. In lieu of complying with the requirements in sub. **c3d** or **c4d**, the owner or operator of a facility may use a VOC emission control system to control VOC emissions from the industrial cleaning operations at the facility provided one of the following requirements is met:

cad The emission control system has a minimum overall emission reduction efficiency of 85% for VOC emissions as determined in accordance with s. **NR 439.06 c3d camd**.

cbd The emission control system has a minimum VOC capture efficiency of 90% and an output of VOC emissions of less

than 50 ppm calculated as carbon, not including methane and ethane, with no dilution, as determined in accordance with s. **NR 439.06 c3d cad**.

ccd The emission control system meets the requirements of the applicable source specific rule in chs. **NR 420 to 422**.

c7d GENERAL PROHIBITIONS. The owner or operator of a facility may not atomize any solvent or solvent solution unless the resulting VOC emissions are controlled by an air pollution control system that meets one of the requirements of sub. **c6d**.

c8d ALTERNATIVE COMPLIANCE OPTION. In lieu of complying with the requirements in sub. **c3d**, the owner or operator of a facility may use solvents or solvent solutions for industrial cleaning operations which have a VOC composite partial vapor pressure of less than or equal to 10 mm of Hg at 20vC.

c9d RECORDKEEPING REQUIREMENTS. **cad** To determine applicability under sub. **c1d**, each owner or operator of an industrial cleaning operation at a facility located in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county shall maintain records of the maximum theoretical emissions of VOCs from the facility excluding any maximum theoretical emissions of VOCs resulting from combustion, or VOCs specifically subject to s. **NR 419.05, 419.06, or 419.08, ch. NR 420, 421, or 422, or s. NR 423.03, 423.05, 424.04, or 424.05**.

cbd Each owner or operator of a facility that is exempt under sub. **c2d** shall collect and record the information specified in this paragraph as appropriate:

1. Any owner or operator claiming to be exempt under sub. **c2d cbd 3**, shall maintain records of the daily quantity in gallons of VOC-containing solvents and solvent solutions used for industrial cleaning operations.

2. Any owner or operator claiming to be exempt under sub. **c2d cbd 4**, shall maintain records of the amount used in gallons of non-compliant solvents and solvent solutions and the amount used in gallons of any coatings and inks exempt under s. **NR 422.03 c7d** during any 12 consecutive months at a facility.

3. Any owner or operator claiming to be exempt under sub. **c2d ccd** shall maintain records of the daily quantity in fluid ounces of VOC-containing aerosol product used for industrial cleaning operations.

4. Any owner or operator claiming to be exempt under sub. **c2d cgd** shall maintain a record of the VOC contents of the solvents or solvent solutions used in kilograms per liter or pounds per gallon.

ccd Each owner or operator of a facility that is subject to this section shall collect and record the information specified in this paragraph as appropriate:

1. Any owner or operator subject to sub. **c3d** shall maintain a record of the VOC contents of the solvents or solvent solutions used in industrial cleaning operations in kilograms per liter, pounds per gallon or weight percent.

2. Any owner or operator subject to sub. **c6d** shall keep a record of the results of any testing conducted as required under sub. **c6d**.

3. Any owner or operator subject to sub. **c8d** shall keep a record of the VOC composite partial vapor pressures of solvents or solvent solutions used in industrial cleaning operations.

cdd Records required under this subsection shall be kept for five years unless another time period is approved by the department.

History: Cr. Register, January, 2001, No. 541, eff. 2-1-01; CR 02-097: am. c1d Register June 2004 No. 582, eff. 7-1-04, correction in c9d cad made under s. 13.93 c2md cbd 7. stats., Register June 2004 No. 582; CR 08-102: am. ctitled, c1d cad, cbd, c2d cintro.d, cbd cintro.d, 4., ced, cgd, c3d cintro.d, c6d cad, cbd and c9d cad

Register July 2009 No. 643, eff. 8-1-09; correction in c9d cad made under s. 13.92 c4d cbd 7., Stats., Register July 2009 No. 643; CR 11-005: am. c2d cad 1., c4d cintro.d, cad, cr. c2d chd Register January 2012 No. 673, eff. 2-1-12; CR 20-088: am. c2d cad 1. Register May 2022 No. 797, eff. 6-1-22.

NR 423.037 Industrial cleaning operations — part

2. c1d **APPLICABILITY.** Beginning on March 1, 2013, except as provided in sub. **c9d cad**, this section applies to industrial cleaning operations at facilities that are located in Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county and having actual VOC emissions from industrial cleaning operations equal to or exceeding 3 tons on a 12 consecutive month rolling basis from the facility with all control equipment inoperative.

c2d **EXEMPTIONS.** If any exemption in this subsection is based on an exemption threshold and that threshold is exceeded, the exemption will no longer apply to the facility. The following exemptions are applicable to various provisions of this section:

cad This section does not apply to:

1. Operations regulated under s. [NR 422.127 c3md](#), [422.128 c7d](#), or [423.03](#).
2. Stripping of cured coatings, cured inks, or cured adhesives.
3. Cleaning operations in graphic arts pre-press areas including the cleaning of film processors, color scanners or plate processors, or film cleaning and plate cleaning.
4. Cleaning operations associated with the following activities:
 - a. Aerospace assembly and component coating operations.
 - b. Wood furniture coating.
 - c. Coating of marine vessels and components and other structures intended for exposure to a marine environment.
 - d. Flexographic printing.
 - e. Lithographic printing.
 - f. Flat wood panel and wood flat stock coating.
 - g. Large appliance coating.
 - h. Furniture metal coating.
 - i. Paper, film, and foil coating.
 - k. Fabric and vinyl coating.
 - L. Plastic parts and products coating.
 - n. Miscellaneous metal parts and products coating.
 - p. Motor vehicle and mobile equipment assembly and coating operations.
 - q. Locomotive and railcar assembly and coating operations.
 - r. Surface preparation of precision optics.

- s. Surface preparation of numismatic dies.
- u. Resin, coating, ink, and adhesive mixing and molding equipment operation.
- w. Can coating.
- x. Coil coating.
- za. Coating manufacturing.
- ze. Screen printing.
- zf. Letterpress printing.
- zg. Rotogravure printing.
- zh. Automobile refinishing.
- zi. Synthetic resins manufacturing.

cbd Subsection **c3d** does not apply to any of the following activities or facilities:

1. Cleaning conducted in conjunction with performance laboratory tests on coatings, adhesives or inks; research and development programs; and laboratory tests in quality assurance laboratories.

3. Medical device and pharmaceutical manufacturing facilities using less than a total of 1.5 gallons per day of VOC-containing solvents and solvent solutions for industrial cleaning operations.

ccd Subsections **c3d** and **c7d** do not apply to cleaning with aerosol products if 160 fluid ounces or less of VOC-containing aerosol products are used per day for industrial cleaning operations, per facility.

cagd Subsections **c3d**, **c6d**, **c7d**, and **c8d** do not apply to digital printing.

ccrd Subsections **c3d**, **c4d**, **c6d**, **c8d**, and **c9d ccd** do not apply to use of industrial adhesives and adhesive primers.

cdd Subsection **c7d** does not apply to cleaning with solvents or solvent solutions in spray bottles or containers described in sub. **c4d cbd**.

ced Subsection **c7d** does not apply to the cleaning of the nozzle tips of automated spray equipment systems, except for robotic systems that are programmed to spray into a closed container.

cfid Subsection **c7d** does not apply to automatically applied blanket or roller wash.

c3d **SOLVENT AND SOLVENT SOLUTION REQUIREMENTS.** Except as provided under sub. **c6d**, no owner or operator of a facility may cause, allow or permit the use of a solvent or solvent solution for industrial cleaning operations on and after May 1, 2010 unless the VOC content of the solvent or solvent solution is less than or equal to the applicable VOC content listed in Table 1 for the respective cleaning operation.

Table 1
VOC Content Limits for Solvents and Solvent Solutions Used in Industrial Cleaning Operations

Cleaning Activity	VOC Content of Solvent or Solvent Solution in kilograms per liter pounds per gallon
cad Product cleaning during manufacturing process or surface preparation for coating, adhesive or ink application	
1. General	0.05 c0.42d
2. Electrical apparatus components and electronic components	
a. General	0.10 c0.83d
b. Cables	0.40 c3.3d
c. Touch-up performed on printed circuit boards where surface mounted devices have already been attached	0.80 c6.7d
4. Medical devices and pharmaceuticals	0.80 c6.7d
cbd Repair and maintenance cleaning	
1. General	0.05 c0.42d
2. Electrical apparatus components and electronic components	
a. General	0.10 c0.83d
b. Cables	0.40 c3.3d
3. Medical devices and pharmaceuticals	
a. Tools, equipment and machinery	0.80 c6.7d
b. General work surfaces	0.60 c5.0d
5. Ink and adhesive manufacturing	0.20 c1.7d
ccd Cleaning of coatings excluding adhesives application equipment	0.05 c0.42d
ced Cleaning of polyester resin application equipment	0.05 c0.42d

c4d CLEANING DEVICES AND METHODS REQUIREMENTS. Except as provided under sub. **c6d**, by November 1, 2009, the owner or operator of a facility shall comply with the following requirements associated with the identified cleaning devices or methods when using solvents or solvent solutions:

cad Physically rub a surface with a porous applicator such as a rag, paper, sponge, or a cotton swab moistened with solvent or solvent solution.

cbd Closed containers or hand held spray bottles from which solvents or solvent solutions are applied without a propellant-induced force.

ccd Cleaning equipment which has a solvent or solvent solution container that is closed during cleaning operations, except when depositing and removing objects to be cleaned, and is closed during non-operation with the exception of maintenance and repair to the cleaning equipment itself.

cdd A remote reservoir cleaner operated in compliance with all of the following requirements:

1. Solvent vapors are prevented from escaping from the solvent or solvent solution container by using devices such as a cover or a valve when the remote reservoir is not being used, cleaned, or repaired.

2. Flow is directed in a manner that prevents solvent or solvent solution from splashing outside of the remote reservoir cleaner.

3. The cleaner is not used for cleaning porous or absorbent materials, such as cloth, leather, wood, or rope.

4. Only solvent or solvent solution containers free of all liquid leaks are used. Auxiliary equipment, such as pumps, pipelines, or flanges, may not have any liquid leaks, visible tears, or cracks. Any liquid leak, visible tear, or crack detected shall be repaired within one calendar day, or the leaking section of the remote reservoir cleaner shall be drained of all solvents or solvent solutions and shut down until it is replaced or repaired.

ced A non-atomized flow method where the used solvents or solvent solutions are collected in a container or a collection sys-

tem which is closed, except for the solvent or solvent solution collection openings that may be open when filling or emptying, or the opening caused by use of a pressure relief valve.

cf d A flushing method where the used solvents or solvent solutions are discharged into a container which is closed, except for the solvent or solvent solution collection openings that may be open when filling or emptying, or the opening caused by use of a pressure relief valve. The discharged solvents or solvent solutions shall be collected into containers without atomizing into the open air.

c5d STORAGE, DISPOSAL, AND TRANSPORT. The owner or operator of a facility shall store all solvents or solvent solutions used in industrial cleaning operations in non-absorbent, non-leaking containers which shall be kept covered except when filling or emptying. Cloth and paper moistened with solvents or solvent solutions shall be stored in covered, non-absorbent, non-leaking containers. VOC-containing cleaning materials shall be conveyed in closed containers or pipes.

c6d CONTROL EQUIPMENT. In lieu of complying with the requirements in sub. **c3d** or **c4d**, the owner or operator of a facility may use a VOC emission control system to control VOC emissions from the industrial cleaning operations at the facility provided one of the following requirements is met:

cad The emission control system has a minimum overall emission reduction efficiency of 85% for VOC emissions as determined in accordance with s. **NR 439.06 c3d cad**.

cbd The emission control system has a minimum VOC capture efficiency of 90% and an output of VOC emissions of less than 50 ppm calculated as carbon, not including methane and ethane, with no dilution, as determined in accordance with s. **NR 439.06 c3d cad**.

ccd The emission control system meets the requirements of the applicable source specific rule in chs. **NR 420** to **422**.

c7d GENERAL PROHIBITIONS. The owner or operator of a facility may not atomize any solvent or solvent solution unless the resulting VOC emissions are controlled by an air pollution control system that meets one of the requirements of sub. **c6d**.

c8d ALTERNATIVE COMPLIANCE OPTION. In lieu of complying with the requirements in sub. **c3d**, the owner or operator of a facility may use solvents or solvent solutions for industrial cleaning operations which have a VOC composite partial vapor pressure of less than or equal to 8 mm of Hg at 20vC.

c9d RECORDKEEPING REQUIREMENTS. cad To determine applicability under sub. **c1d**, each owner or operator of an industrial cleaning operation at a facility located in Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, or Waukesha county shall maintain records of all of the following for solvent and solvent solutions used for cleaning activities:

1. The VOC content of each solvent or solvent solution used.
2. The volume of each solvent or solvent solution used per month.
3. The total emissions, before consideration of controls, for each month from all solvents or solvent solutions.
4. The total emissions, before consideration of controls, for each consecutive 12 month period from all solvents or solvent solutions.

cbd Each owner or operator of a facility that is exempt under sub. **c2d** shall collect and record the information specified in this paragraph as appropriate.

1. Any owner or operator claiming to be exempt under sub. **c2d cbd 3**. shall maintain records of the daily quantity in gallons of VOC-containing solvents and solvent solutions used for industrial cleaning operations.

3. Any owner or operator claiming to be exempt under sub. **c2d ccd** shall maintain records of the daily quantity in fluid ounces of VOC-containing aerosol product used for industrial cleaning operations.

ccd Each owner or operator of a facility that is subject to this section shall collect and record the information specified in subds. **1g** and **1r**, and also in subd. **2**. as appropriate:

1g. The name and identification of each cleaning material and the associated solvent cleaning activity.

1r. The VOC content, based upon Method 24 in **40 CFR part 60**, Appendix A, incorporated by reference in s. **NR 484.04 c13d**, of each cleaning material, in pounds per gallon of material, as employed or the VOC composite partial vapor pressure of the solvents or solvent solutions used in industrial cleaning operations, depending on whether the cleaning material is subject to sub. **c3d** or **c8d**.

2. Any owner or operator subject to sub. **c6d** shall keep a record of the results of any testing conducted as required under sub. **c6d** and shall meet the requirements in s. **NR 439.04 c6d**.

cdd Records required under this subsection shall be kept for 5 years unless another time period is approved by the department.

History: CR 08-102: cr. Register July 2009 No. 643, eff. 8-1-09; CR 11-005: renum. c9d cad to be c9d cad cintro.d and am., am. c1d, c2d cad 1., 4. b., d., g., i., k., w., c3d Table 1, c4d cintro.d, cad, c5d, c9d ccd cintro.d, 2., r. c2d cad 4. j., m., o., t., v., y., z., zb., zc., zd., 5., cbd 2., 4., cgd, c9d cbd 2., 4., ccd 1., 3., cr. c2d cad 4. ze., zf., zg., zh., zi., ccgd, ccrd, c9d cad 1., 2., 3., 4., ccd 1g., 1r. Register January 2012

No. 673, eff. 2-1-12; reprinted to correct transcription error in c1d Register February 2012 No. 674; CR 20-088: am. c2d cad 1. Register May 2022 No. 797, eff. 6-1-22.

NR 423.05 Liquid VOC solvent dry cleaning. c1d APPLICABILITY. This section applies to liquid VOC solvent washers, dryers, solvent filters, settling tanks, vacuum stills, piping, ductwork, pumps, storage tanks, and other containers and conveyors of liquid VOC solvent that are used in a liquid VOC solvent dry cleaning facility which has maximum theoretical emissions of VOCs from the facility greater than or equal to one of the following:

cad 25 tons per year for a facility which is located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington, or Waukesha.

cbd 100 tons per year for a facility which is located in the county of Door, Kewaunee, Manitowoc, Sheboygan, or Walworth.

c2d REQUIREMENTS. cad The owner or operator of a liquid VOC solvent dry cleaning facility shall limit VOC emissions from each liquid VOC solvent dry cleaning dryer to an average of 3.5 kilograms per 100 kilograms, dry weight, of articles cleaned, or install and operate a solvent recovery dryer in a manner such that the dryer remains closed and the recovery phase continues until the flow rate of recovered solvent no longer exceeds 50 milliliters per minute.

cbd The owner or operator of a liquid VOC solvent dry cleaning facility shall reduce the VOC content of all filtration wastes to not more than 1.0 kilogram per 100 kilograms, dry weight, of articles cleaned before disposing of such wastes or exposing them to the atmosphere, or install and operate a cartridge filtration system, and drain the filter cartridges in their sealed housings for at least 8 hours before removing them.

ccd The owner or operator of a liquid VOC solvent dry cleaning facility shall repair all solvent vapor and liquid leaks within 3 working days of their discovery. If necessary repair parts are not on hand, the owner or operator shall order them within 3 working days following discovery of solvent vapor or liquid leaks and repair the leaks within 3 working days following receipt of the parts.

c3d COMPLIANCE SCHEDULES. The requirements of this section are applicable on startup except that a petroleum liquid dry cleaning facility in existence on January 1, 1994 and which was not subject to this section prior to January 1, 1994 shall achieve final compliance with the requirements of this section no later than May 31, 1995.

Note: XMaximum theoretical emissionsY has the meaning given in s. **NR 419.02 c11d**.

History: Renum. from NR 154.13 c6d ccd and am. Register, September, 1986, No. 369, eff. 10-1-86; am. c1d, Register, February, 1990, No. 410, eff. 3-1-90; renum. c1d to be c1d cintro.d and am., cr. c1d cad and cbd and c3d, Register, December, 1993, No. 456, eff. 1-1-94; am. c1d, c2d, c3d cad, Register, December, 1996, No. 492, eff. 1-1-97; CR 02-146: am. c1d cintro.d, c2d and c3d Register October 2003 No. 574, eff. 11-1-03; correction in c3d made under s. 13.93 c2md cbd 7., Stats., Register June 2004 No. 582.