

## Chapter NR 422

**CONTROL OF ORGANIC COMPOUND EMISSIONS  
FROM SURFACE COATING, PRINTING AND ASPHALT  
SURFACING OPERATIONS**

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**NR 422.01 Applicability; purpose.** (1) **APPLICABILITY.** This chapter applies to all surface coating and printing process air contaminant sources and to their owners and operators. This chapter also applies to the handling and use of cutback asphalts for application to surfaces traversed by motor vehicles, bicycles or pedestrians and to all persons responsible for such handling and use.

(2) **PURPOSE.** This chapter is adopted under ss. 144.31 and 144.38, Stats., to categorize organic compound emissions from surface coating, printing and asphalt surfacing operations into separate organic compound air contaminant source categories and to establish emission limitations or other requirements 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 422.02 Definitions.** The definitions contained in chs. NR 400, 419 and 421 apply to the terms used in this chapter. In addition, the following definitions apply to the terms used in this chapter:

(1) "Adhesion promoter" means a coating used to promote adhesion of a topcoat on surfaces such as trim moldings, door locks and door sills, where sanding is impractical.

(1e) "Adhesive" means any substance that is used to bond one surface to another surface by attachment.

(1m) "Adhesive primer" means a coating that is applied directly to a substrate in order to seal the substrate and to provide a bonding surface for an adhesive prior to the application of the adhesive.

(1s) "Air dried coating" means coatings which are dried by the use of air or forced warm air. Forced warm air includes processes whereby the coated object is heated above ambient temperature up to a maximum of 90°C (194°F) to decrease drying time.

(1x) "Antiglare/safety coating" means a low gloss coating formulated to eliminate glare for safety purposes on interior surfaces of a vehicle, as specified under the U.S. department of transportation standard for reflecting surfaces in 49 CFR 571.107, as in effect on October 1, 1994.

(2) "Application area" means the area where a coating is applied by spraying, dipping or flow coating techniques.

(3) "Asphalt" means a dark-brown to black cementitious material (solid, semisolid or liquid in consistency) in which the predominating constituents are bitumens which occur in nature as such or which are obtained as residue in refining petroleum.

(3e) "Basecoat" means, for the purpose of wood furniture coating, a coat of colored material, usually opaque, that is applied before other inks, coatings, or opaque finishing materials and which usually has a topcoat subsequently applied for protection.

(3m) "Basecoat-clear coat system" means a topcoat system composed of a pigmented coating followed by a clear coat.

(4) "Baseline transfer efficiency" means the typical transfer efficiency, as defined by the department, for a specific operation in an industry.

(5) "Blade coating" means the application of a coating material to a substrate by means of drawing the substrate beneath a straight-edged blade that spreads the coating evenly over the full width of the substrate.

(6) "Blanket or roller wash" means any cleaning solvent or solution used to remove excess inks, oils and debris from the blanket roller or inking rollers on a lithographic printing press.

(7) "Class II hardboard paneling finish" means a finish that meets the specifications of ANSI/AHA A135.5-1988 as approved by the American National Standards Institute. This standard is incorporated by reference in ch. NR 484.

(7m) "Cleaning operation" means, for the purpose of wood furniture coating, any activity in which organic solvent is used to remove accumulated coating residue from equipment used in a finishing operation.

(8) "Clear coat" means a coating which lacks color and opacity or is transparent and uses the undercoat as a reflectant base or undertone color.

(9) "Coating applicator" means a device or devices used at a single location in a coating line to apply a surface coating of a particular material.

(10) "Coating line" means one or more apparatus or operations, which may include a coating applicator, flashoff area and oven, wherein a surface coating is applied, dried or cured.

(11) "Coil coating" means the coating of any flat metal sheet or strip that comes in rolls or coils.

(11m) "Conductive ink" means an ink used in screen printing which contains material that permits electric current to flow through printed lines or patterns.

(12) "Cutback asphalt" means asphalt cement which has been liquefied by blending with petroleum solvents (diluent) other than residual oils. Upon exposure to atmospheric conditions the diluents evaporate, leaving the asphalt cement to perform its function. Asphalt which contains less than 5% by weight petroleum solvents (disregarding any residual oils added) is not included in this definition.

(12d) "Elastomeric coatings" means coatings that are specifically formulated for application over flexible parts such as filler panels and elastomeric bumpers.

(12e) "Electrostatic application" means a coating method in which an electrical charge is applied to the object coated and the airborne particles of coating are attracted to the object due to the electrostatic potential created.

(12m) "Emergency response vehicle" means any motor vehicle specifically designed to carry equipment and personnel involved in providing emergency medical or rescue services.

(12s) "Emulsified asphalt" means an emulsion of asphalt cement and water which contains a small amount of an emulsifying agent; a heterogeneous system containing 2 normally immiscible phases (asphalt and water) in which the water forms the continuous phase of the emulsion, and minute globules of asphalt form the discontinuous phase.

(13) "End sealing compound" means a synthetic rubber compound which is coated onto can ends and which functions as a gasket when the end is assembled on the can.

(14) "Exterior base coating" means a coating applied to the exterior of a can to provide exterior protection to the metal and to provide background for the lithographic or printing operation.

(15) "Extreme performance coatings" means coatings designed for harsh exposure or exposure to one or more of the following: the weather all of the time, temperatures consistently above 95°C, detergents, abrasive and scouring agents, solvents, corrosive atmospheres or similar environmental conditions.

(16) "Fabric coating" means applying a coating, including a saturation coating, or printing on to a textile substrate with a blade, roll, rotogravure or dip coater, or other coating applicator, to impart properties that are not initially present, such as strength, stability, water or acid repellency, or appearance.

(16e) "Field-reacted traffic marking material" means a liquid traffic marking material, such as epoxy or polyester, which consists of resin, pigments and a hardening agent, and which is mixed at the time of application and designed to harden quickly.

(16g) "Final touch-up and repair" means, for the purpose of wood furniture coating, the localized application of finishing materials after the finishing operation to cover minor imperfections.

(16i) "Finishing material" means, for the purpose of wood furniture coating, coatings used to finish wood furniture, including, but not limited to, basecoats, stains, washcoats, sealers and topcoats. The term "finishing material" does not include industrial adhesives.

(16k) "Finishing operation" means, for the purpose of wood furniture coating, the application of finishing material to a substrate that is subsequently air dried, cured by radiation, or cured in an oven and the use of organic solvent in associated cleaning and washoff operations.

(16m) "Fire truck" means any motor vehicle specifically designed to be used in fighting fires and to carry equipment and personnel involved in fighting fires.

(17) "Flashoff area" means the space between the application area and the oven.

(18) "Flexographic printing" means the application of words, designs or pictures to a substrate by means of a roll printing technique in which the pattern to be applied is raised above the printing roll and the image carrier is made of rubber or other elastomeric materials.

(18m) "Flow coating" means a coating method in which an object is coated by causing a stream of coating to flow over the object and draining off any excess coating.

(18s) "Fountain solution" means a mixture of water, volatile and non-volatile chemicals and other additives which is applied to the image plate to maintain the hydrophilic properties of the nonimage areas of the printing plate surface.

(19) "Furniture metal coating" means the surface coating of any furniture made of metal or any metal part which will be assembled with other metal, wood, fabric, plastic or glass parts to form a furniture piece.

(20) "Hardboard" means a panel manufactured primarily from interfelted ligno-cellulosic fibers which are consolidated under heat and pressure in a hot press.

(21) "Hardwood plywood" means a plywood whose surface layer is a veneer of hardwood.

(21e) "Heatset" means a lithographic web printing process where solvents from the printing ink are evaporated by heat from a dryer.

(21m) "High performance architectural coatings" means a coating which meets the requirements specified in Architectural Aluminum Manufacturer's Association publication number AAMA 605.2-85, incorporated by reference in ch. NR 484.

(21s) "Ink transfer" means a decal, printed using screen printing onto a special release carrier, that will be transferred from the carrier to a substrate. Final transfer of the decal to the substrate may or may not occur at the screen printing facility.

(22) "Interior body spray" means a coating sprayed on the interior of the can body to provide a protective film between the product and the can.

(23) "Interior sheet base coating" means a coating applied by roller coater or spray to the interior side of sheets from which cans are formed to provide a protective lining between the can metal and product.

(24) "Large appliances" means doors, cases, lids, panels and interior support parts of residential and commercial washers, dryers, ranges, refrigerators, freezers, water heaters, dishwashers, trash compactors, air conditioners and other similar products. Not included are products of such weight that they are normally lifted only with powered lifting equipment or products which are intended to be permanently fastened in place.

(24m) "Leather coating" means the coating of any raw or processed leather material with a roll coater, spray system or other coating applicator to impart or enhance properties such as strength, stability, water or acid repellency, color or appearance.

(24p) "Lithographic printing" means a planographic printing process where the image and nonimage areas are chemically differentiated; the image area is oil receptive and the nonimage area is typically water receptive.

(24q) "Lithographic printing press" means a printing production assembly comprised of one or more inking and fountain solution dampening systems and includes any associated cleaning solutions, ovens, dryers, flashoff areas and chillers.

(24s) "Low-pressure spray method" means any coating method in which an object is coated with an air-atomizing spray gun that operates at no more than 69 kPa (10.0 psig) air pressure.

(25) "Low solvent coating or ink" means a coating or ink which contains less organic solvent than the conventional coatings used by the particular industry. Low solvent coatings or inks include waterborne, higher solids, electrodeposition and powder coatings or inks.

(26) "Magnet wire coating" means the process of applying a coating of electrically insulating varnish or enamel to aluminum or copper wire for use in electrical machinery.

(27) "Manufacturing plant" means a facility where parts are manufactured, finished or assembled for eventual inclusion into a finished product ready for sale to retailers. With respect to the manufacture of motor vehicles, customizers, body shops and other repainters are not included in this definition.

(27m) "Molded wood parts or products" means any composite shape molded, through heat, pressure and time, from a mixture of less than 30% by weight organic thermoset resin, and at least 10% by weight wood filler.

(28) "Natural finish hardwood plywood panels" means panels whose original grain pattern is enhanced by essentially transparent finishes which may be supplemented by fillers and toners.

(28g) "Non-heatset" means a lithographic printing process where the printing inks are set without the application of heat. Ultraviolet-cured and electron beam-cured inks are considered non-heatset.

(28j) "Office partitions" means partitions fabricated from honeycomb laminate or wood laminate which is placed inside a steel base support frame with a final outside covering of vinyl, cloth or laminate.

(28m) "Organisol" means a thick coating containing resin, plasticizers and organic solvent used to coat flexible substances such as paper or fabrics.

(29) "Oven" means, for the purpose of surface coating, a chamber within which heat is used to bake, cure, polymerize or dry a surface coating.

(30) "Overvarnish" means a coating applied directly over ink to reduce the coefficient of friction, to provide gloss and to protect the finish against abrasion and corrosion.

(31) "Packaging rotogravure printing" means rotogravure printing upon paper, paper board, metal foil, plastic film or other substrates, which in subsequent operations are formed into packaging products or labels for articles to be sold.

(32) "Paper coating" means application of the uniform coatings, including saturation coatings, put on paper and pressure sensitive tape in a web process. Related web coating processes on plastic films and on metal foil are included in this definition but processes such as printing where the coating is not uniform across the web are not included.

(33) "Penetrating prime coat" means an application of low-viscosity liquid asphalt to an absorbent surface to prepare it for an asphalt surface.

(33d) "Pigmented coating" means an opaque coating which contains binders and colored pigments and which is formulated to hide a surface, either as an undercoat or topcoat.

(33g) "Plastisol" means a composition of finely divided resin and plasticizer used to coat flexible substances such as paper or fabrics which is applied as a thick gel which solidifies when heated.

(33j) "Precoat" means any coating which is applied to bare metal primarily to deactivate the metal surface for corrosion resistance to a subsequent water-base prime coat.

(33m) "Pretreatment coat" means a coating applied directly to metal substrates and which contains at least 0.50% acid, by weight, and is used to provide surface etching, corrosion resistance and enhanced adhesion of subsequent coatings.

(34) "Prime coat" means a coating applied directly to a substrate or on top of a pretreatment coat or other coating for purposes of filling pores in the substrate, providing corrosion resistance or enhancing adhesion or blister resistance of subsequent coatings.

(34m) "Prime pigments" means pigments or solids which contribute to the overall coating color. Pigments whose main function is to act as a filler or provide corrosion resistance rather than providing color are not prime pigments.

(34s) "Primer sealer" means a coating, applied subsequent to the prime coat or primer surfacer, that improves the adhesion of the topcoat,

provides corrosion resistance and prevents solvents from the topcoats from penetrating into the prime coat or primer surfacer coating.

(34v) "Primer surfacer" means a coating which fills in irregularities, and is intentionally thick enough to permit sanding without cutting through to bare metal.

(35) "Printed interior panels" means panels whose grain or natural surface is obscured by fillers and basecoats upon which a simulated grain or decorative pattern is printed.

(36) "Publication rotogravure printing" means rotogravure printing upon paper which is subsequently formed into books, magazines, catalogues, brochures, directories, newspaper supplements, and other types of printed materials.

(37) "Quench area" means a chamber where the hot metal exiting the oven is cooled by either a spray of water or a blast of air followed by water cooling.

(37s) "Refinishing" means any coating of motor vehicles, their parts and components, including parts or components replaced in body collision repairs, for the purpose of protection or beautification and which is subsequent to the original coating applied at the plant where the equipment was manufactured.

(37v) "Restricted alcohol" means an alcohol which contains only one hydroxyl (-OH) group and less than 5 carbon atoms.

(38) "Roll coating" means the application of a coating material to a substrate by means of hard rubber or steel rolls.

(39) "Roll printing" means the application of words, designs or pictures to a substrate, usually by means of a series of hard rubber or steel rolls each with only partial coverage.

(40) "Rotogravure coating" means the application of a coating material to a substrate by means of a roll coating technique in which the pattern to be applied is etched on the coating roll. The coating material is transferred to the substrate from the recessed areas on the coating roll.

(41) "Rotogravure printing" means the application of words, designs or pictures to a substrate by means of a roll printing technique which involves an intaglio or recessed image areas in the form of cells.

(41m) "Saturation coating" means application of a coating which permeates the substrate to which it is applied.

(41p) "Screen printing" means a process in which ink or coating is passed through a taut screen mesh or fabric, to which a refined form of stencil has been applied, onto a substrate. The stencil openings determine the form and dimensions of the imprint made on the substrate.

(41s) "Screen printing unit" means a printing application station and its associated flashoff area, ovens or dryers, conveyors or other equipment operating as part of the screen printing process. Screen reclamation is considered to be part of the screen printing process.

(41v) "Screen reclamation" means the removal of the stencil or of residual ink or coating from the screen mesh or fabric after excess ink or coating has been removed from the screen or fabric.

(41w) "Sealer" means, for the purpose of wood furniture coating, any coating applied to substrates to prevent subsequent coatings from being absorbed by the substrate, or to prevent harm to subsequent coatings by materials in the substrate.

(41y) "Sheet-fed" means a lithographic printing process where individual sheets of substrate are fed to the press sequentially.

(42) "Single coat" means a single film of coating applied directly to a metal substrate, omitting the primer application.

(42m) "Special purpose screen printing inks and coatings" means inks and coatings used in screen printing which are conductive inks, are used to print ink transfers, or are designed to resist or withstand any of the following:

(a) More than 2 years of outdoor exposure.

(b) Exposure to chemicals, solvents, acids, detergents, oil products or cosmetics.

(c) Temperatures in excess of 170° F.

(d) Vacuum forming.

(e) Embossing.

(f) Molding.

(42n) "Specialty coatings" means coatings used only for discrete portions of the vehicle, such as bumpers or spot repairs, which are necessary due to unusual coating performance requirements. Specialty coatings include, but are not limited to, adhesion promoters, uniform finish blenders, elastomeric coatings, gloss flatteners, bright metal trim repair and antiglare/safety coatings.

(42o) "Stain" means, for the purpose of wood furniture coating, any color coat having a solids content of no more than 8.0%, by weight.

(42q) "Stripe-kilometer" means one 10-centimeter-wide solid stripe of traffic marking material that is 1.0 kilometer long.

(42s) "Stripe-mile" means one 4-inch-wide solid stripe of traffic marking material that is 1.0 mile long.

(42u) "Strippable spray booth coating" means, for the purpose of wood furniture coating, a coating that is applied to a spray booth wall as a protective film to receive overspray during finishing operations and that is subsequently peeled off, thereby reducing or eliminating the need to use organic solvents to clean spray booth walls.

(43) "Surface coating" means the application of a coating to a product in a coating line.

(43m) "Surface preparation products" means products used to remove wax, tar, grease and silicone from the surface to prepare the surface for refinishing.

(44) "Thin particleboard" means a manufactured board 0.64 centimeters (¼ inch) or less in thickness made of individual wood particles which have been coated with a binder and formed into flat sheets by pressure.



(44m) "Three or four stage coating system" means a topcoat system composed of a pigmented coating, one or two semi-transparent midcoats, and a clear coat.

(45) "Three-piece can side-seam spray" means a coating sprayed on the exterior and interior of a welded, cemented or soldered seam to protect the exposed metal.

(46) "Tileboard" means paneling that has a colored waterproof surface coating.

(46m) "Tinted pigmented coating" means a pigmented coating which contains less than 99.5% by weight white prime pigment as a percentage of all prime pigments.

(47) "Topcoat" means a coating or coating system in which one or more coats are applied over a prime coat or basecoat for purposes of appearance, identification or protection of the substrate.

(47e) "Touch-up coating" means a coating applied by brush or hand held, non-refillable aerosol cans to repair minor surface damage and imperfections.

(47m) "Traffic marking material" means any substance, either solid or liquid at time of application, used to provide lane delineation or other traffic guidance or information on paved surfaces. Markings provided by traffic marking material include, but are not limited to, centerlines, edge-lines, lane lines, turn arrows, parking stall markings, crosswalks, curb markings, railroad markings and airport taxi and runway markings.

(48) "Transfer efficiency" means the portion of coating solids which adheres to the surface being coated during the application process, expressed as a percentage of the total volume of coating solids delivered to the applicator.

(49) "Two-piece can exterior end coating" means a coating applied by roller coating or spraying to the exterior end of a can to provide protection to the metal.

(49m) "Uniform finish blender" means a thinner or low solids clear solution which is used to blend overspray from a repaired area into the unrepaired color.

(50) "Vinyl coating" means printing on or applying a decorative or protective topcoat, other than vinyl plastisols or organisol, to vinyl or urethane coated fabric or vinyl or urethane sheets.

(50e) "Washcoat" means, for the purpose of wood furniture coating, a transparent coating having a solids content, by weight, of 12.0% or less applied over initial stains to protect and control color and prepare the wood for sanding.

(50m) "Washoff operation" means, for the purpose of wood furniture coating, the process of using an organic solvent to remove coating from a substrate.

(50v) "Web" means a substrate onto which inks or coatings are applied after the substrate is unwound from a continuous roll and prior to the substrate being rewound or cut.

(51) "White pigmented coating" means a pigmented coating which contains 99.5% or more by weight white prime pigment as a percentage of all prime pigments.

(52) "Wood furniture" means any wood product that is within one of the following standard industrial classification codes, as described in the Standard Industrial Classification Manual, 1987, incorporated by reference in s. NR 484.05:

- (a) 2434 - wood kitchen cabinets.
- (b) 2511 - wood household furniture, except upholstered.
- (c) 2512 - wood household furniture, upholstered.
- (d) 2517 - wood television, radios, phonograph and sewing machine cabinets.
- (e) 2519 - household furniture, not elsewhere classified.
- (f) 2521 - wood office furniture.
- (g) 2531 - public building and related furniture.
- (h) 2541 - wood office and store fixtures, partitions, shelving and lockers.
- (i) 2599 - furniture and fixtures, not elsewhere classified.

**History:** Renum. from NR 154.01, Register, September, 1986, No. 369, eff. 10-1-86; cr. (24m), Register, January, 1987, No. 373, eff. 2-1-87; cr. (21m), Register, July, 1988, No. 391, eff. 8-1-88; cr. (12m), (16m) and (33m), am. (34) and (47), Register, August, 1989, No. 404, eff. 9-1-89; renum. (6) to be NR 400.02 (21m), am. (16), (32) (33m) and (50), cr. (28m), (33g) and (41m), (12s) renum. from NR 400.02 (36), Register, February, 1990, No. 410, eff. 3-1-90; am. (7), Register, May, 1992, No. 437, eff. 6-1-92; am. (50), Register, December, 1993, No. 456, eff. 1-1-94; cr. (11m), (21s), (41p), (41s), (41v) and (42m), am. (32), Register, June, 1994, No. 462, eff. 7-1-94; cr. (16e), (42q), (42s) and (47m), Register, July, 1994, No. 463, eff. 8-1-94; am. (7) and (34), cr. (12e), (18m), (24s), (27m), (33d), (34m), (46m) and (51), Register, August, 1994, No. 464, eff. 9-1-94; cr. (6), (18s), (21e), (24p), (24q), (28g), (37v), (41v) and (50v), Register, June, 1995, No. 474, eff. 7-1-95; am. (intro.) and (47), renum. (1) to be (1s), cr. (1), (1e), (1m), (1x), (3e), (3m), (12d), (16g), (16i), (16k), (28j), (33j), (34s), (34v), (37s), (41w), (42n), (42o), (42u), (43m), (44m), (47e), (49m), (50e), (50m) and (52), Register, August, 1995, No. 476, eff. 9-1-95; correction in (22) and (23) made under s. 13.93 (2m) (b) 1., Stats., Register, August, 1995, No. 475.

**NR 422.03 Exemptions.** Sections NR 422.04 to 422.155 apply to any facility which contains one or more of the surface coating or printing process lines described in ss. NR 422.05 to 422.155, except as specified in this section. If VOC emissions exceed an exemption level given in this section, the exemption will no longer apply to the source. Exempt facilities are subject to the recordkeeping requirements of s. NR 439.04 (4). Exempt facilities include:

(1) Any surface coating process line which meets the specific applicability requirements of ss. NR 422.04 to 422.09 and 422.10 to 422.155 within a facility when actual emissions of VOCs from all surface coating process lines meeting the same applicability requirements within the facility are never greater than 6.8 kilograms (15 pounds) in any one day with all emission control equipment inoperative.

(2) Surface coating facilities as described under s. NR 422.15 or 422.155 which have maximum theoretical emissions of VOCs from all surface coating process lines meeting the applicability requirements of s.

NR 422.15 or 422.155 within the facility of less than or equal to 10 tons per year.

(3) Surface coating facilities as described under ss. NR 422.05 to 422.08, 422.09, 422.10 to 422.13, 422.15 and 422.155 which are 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 and which have total emissions of VOCs from the facility, with all emission control equipment inoperative, of less than or equal to 100 tons per year.

(4) Printing facilities as described under s. NR 422.14 which are located in the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and have maximum theoretical emissions of VOCs from the facility of less than or equal to 25 tons per year, or are located outside the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington and Waukesha and have maximum theoretical emissions of VOCs from the facility of less than or equal to 100 tons per year.

(4m) Screen printing facilities as described under s. NR 422.145 which are:

(a) Located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha; or

(b) Located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and which have maximum theoretical emissions of VOCs from all screen printing units at the facility of less than or equal to 25 tons per year; or

(c) Located in the county of Kewaunee, Manitowoc or Sheboygan and which have maximum theoretical emissions of VOCs from all screen printing units at the facility of less than or equal to 100 tons per year.

(5) Surface coating process sources used exclusively for chemical or physical analysis or determination of product quality and commercial acceptance where:

(a) The operation of the source is not an integral part of the production process; and

(b) The emissions from the source do not exceed 363 kilograms (800 pounds) in any calendar month; and

(c) The exemption is approved in writing by the department.

(6) Leather surface coating facilities as described under s. NR 422.085 which are:

(a) Located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha; or

(b) Located in the counties of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha, and which have maximum theoretical emissions of VOCs from the facility of less than 25 tons per year; or

(c) Located in the counties of Door, Kewaunee, Manitowoc, Sheboygan or Walworth, and which have maximum theoretical emissions of VOCs from the facility of less than 100 tons per year.

(8) Any molded wood parts and products coating facility that is any of the following:

(a) Located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha.

(b) Located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and which has maximum theoretical emissions of VOCs from all molded wood parts and products coating at the facility of less than 25 tons per year.

(c) Located in the county of Kewaunee, Manitowoc or Sheboygan and which has maximum theoretical emissions of VOCs from all molded wood parts and products coating at the facility of less than 100 tons per year.

(9) Any wood entry or passage door coating facility that is any of the following:

(a) Located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha.

(b) Located in the county of Kenosha, Milwaukee, Ozaukee, Racine, Washington or Waukesha and which has maximum theoretical emissions of VOCs from all wood entry or passage door coating at the facility of less than 25 tons per year.

(c) Located in the county of Kewaunee, Manitowoc or Sheboygan and which has maximum theoretical emissions of VOCs from all wood entry or passage door coating at the facility of less than 100 tons per year.

**History:** Renum. from NR 154.13 (4) (a) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (3) and cr. (6), Register, January, 1987, No. 373, eff. 2-1-87; am. (intro.), (2) and (3), Register, August, 1989, No. 404, eff. 9-1-89; am. (intro.), (1) to (4) and (6) (b), Register, February, 1990, No. 410, eff. 3-1-90; am. (intro.) and (2), Register, May, 1992, No. 437, eff. 6-1-92; am. (1) to (4), (6) (a) and (b), Register, December, 1993, No. 456, eff. 1-1-94; cr. (4m), Register, June, 1994, No. 462, eff. 7-1-94; am. (intro.), cr. (8) and (9), Register, August, 1994, No. 464, eff. 9-1-94; am. (1), (3), Register, August, 1995, No. 476, eff. 9-1-95.

**NR 422.04 Methods of compliance.** (1) **IN-LINE AVERAGING.** Compliance with the emission limitations of this chapter may be achieved through a daily volume-weighted average of all coatings or inks applied by emission units in a process line subject to the same numerical emission limitation. Any owner or operator achieving compliance by means of this subsection shall comply with the reporting requirements of s. NR 439.03 (7) and the recordkeeping requirements of s. NR 439.04 (5) (g).

(a) No owner or operator of a coating line subject to an emission limitation contained in ss. NR 422.05 to 422.08, 422.09 to 422.12, 422.132, 422.135, 422.15 or 422.155 and complying with the emission limitation by means of this subsection may cause, allow or permit the daily volume-weighted average VOC content to exceed the emission limitation to which the coatings are subject. For purposes of this paragraph, daily volume-weighted average VOC content shall be calculated by using the following equation:

$$\text{VOC}_A = \left[ \sum_{i=1}^n C_i V_i \right] / V_T$$

where:

$VOC_A$  is the volume-weighted average VOC content of 2 or more coatings applied on a coating line during any day in kilograms per liter (pounds per gallon) of coating, excluding water

$i$  is the subscript denoting an individual coating

$n$  is the number of different coatings subject to the same numerical emission limitation applied during any day on a coating line

$C_i$  is the VOC content of each coating ( $i$ ) as applied during any day on the coating line in kilograms per liter (pounds per gallon) of coating, excluding water

$V_i$  is the volume of each coating ( $i$ ), excluding water, as applied during any day on the coating line in liters (gallons)

$V_T$  is the total volume of all  $n$  coatings subject to the same emission limitation, excluding water, applied during any day on the coating line in liters (gallons)

(b) No owner or operator of a printing line subject to an emission limitation contained in s. NR 422.14 (2) (a) or (b) and complying with the emission limitation by means of this subsection may cause, allow or permit the daily volume-weighted average VOC content to exceed the emission limitation to which the inks are subject:

1. When s. NR 422.14 (2) (a) applies, the daily volume-weighted average VOC content shall be calculated by using the following equation:

$$VOC_B = \frac{\sum_{i=1}^n C_i L_i V_{VFi}}{\sum_{i=1}^n L_i V_{VFi}}$$

where:

$VOC_B$  is the volume-weighted average VOC content of 2 or more inks applied on a printing line during any day in percent VOC by volume of the volatile fraction

$i$  is the subscript denoting an individual ink

$n$  is the number of different inks subject to the same emission limitation applied during any day on a printing line

$C_i$  is the VOC content in percent VOC by volume of the volatile fraction in each ink ( $i$ ) as applied

$L_i$  is the volume of each ink ( $i$ ) as applied in liters (gallons)

$V_{VFi}$  is the volume fraction volatile content in each ink ( $i$ ) as applied

2. When s. NR 422.14 (2) (b) applies, the daily volume-weighted average VOC content shall be calculated by using the following equation:

$$VOC_C = \left[ \frac{\sum_{i=1}^n C_i V_i}{V_T} \right]$$

where:

$VOC_C$  is the volume-weighted average VOC content of 2 or more inks applied on a printing line during any day in percent VOC by volume, excluding water

$i$  is the subscript denoting an individual ink

$n$  is the number of different inks subject to the same emission limitation applied during any day on a printing line

$C_i$  is the VOC content of each ink ( $i$ ) applied during any day on the printing line in percent VOC by volume, excluding water

$V_i$  is the volume of each ink ( $i$ ), excluding water, applied during any day on the printing line in liters (gallons)

$V_T$  is the total volume of all  $n$  inks subject to the same emission limitation, excluding water, applied during any day on the printing line in liters (gallons)

(c) An owner or operator of a coating or printing line subject to an emission limitation in this chapter not specified in par. (a) or (b) may comply by means of this subsection only by obtaining prior department approval through an order issued under s. 144.31 (2) (b), Stats., or through a permit. Any approval granted by the department under this paragraph shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(2) GENERAL METHODS. The surface coating emission limitations shall be achieved by:

(a) The application of low solvent content coating technology; or

(b) A vapor recovery system which recovers the solvent for reuse; or

(c) Incineration or catalytic oxidation, provided that 90% of the nonmethane VOCs (VOC measured as total combustible carbon) which enter the incinerator or oxidation unit are oxidized to non-organic compounds; or

(d) An equivalent system or approach demonstrated to reliably control emissions to a level at or below the applicable emission limit and approved by the department. Any approval granted by the department under this paragraph shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(3) HIGH TRANSFER EFFICIENCY COATING APPLICATION. (a) Surface coating operations covered under ss. NR 422.09 to 422.11 and 422.15 have the added option of achieving compliance with the emission limitation through the use of an alternative control method or system involving a high transfer efficiency coating application system, either when used alone or in conjunction with low solvent content coating technology.

(b) Compliance under the option provided in this subsection must be approved by the department. This requires that:

1. The design, operation and efficiency of the application system must be certified in writing by the owner or operator and submitted to the department for approval, and

2. The solvent usage per coated part for application system must be less than or equal to the solvent usage per coated part at the applicable emission limitation using baseline transfer efficiency.

(c) Each alternative control method or system approval granted by the department under this subsection shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(4) CAPTURE SYSTEMS. The design, operation and efficiency of any capture system used in conjunction with sub. (2) (b), (c) or (d) shall be certified in writing by the owner or operator. The efficiency of the capture system is subject to approval by the department and, for sources covered under ss. NR 422.05 to 422.135 or 422.145 to 422.155, the efficiency of the capture system shall be great enough to insure that the emissions for any day from the controlled line are less than or equal to the amount determined using the following equation:

$$E = \sum_{i=1}^n (A_i B_i C_i / D_i)$$

where:

E is the total allowable daily emissions of VOCs in kilograms (pounds) from all coatings or inks subject to the same numerical emission limitation and applied on the controlled line

i is the subscript denoting an individual coating or ink

n is the number of different coatings or inks applied

A<sub>i</sub> is the allowable emission rate for the coatings or inks pursuant to ss. NR 422.05 to 422.135 and 422.145 to 422.155 in kilograms per liter (pounds per gallon) of coating or ink, excluding water, delivered to the applicator

B<sub>i</sub> is the amount of coating material or ink in liters (gallons), delivered to the applicator during the actual production day

C<sub>i</sub> is the volume fraction of solids in the coating or ink, delivered to the applicator during the actual production day

D<sub>i</sub> is the theoretical volume fraction of solids in the coating or ink necessary to meet the allowable emission rate pursuant to ss. NR 422.05 to 422.135 and 422.145 to 422.155 calculated from:

$$D_i = 1 - [A_i / P_i]$$

where:

P<sub>i</sub> is the density of the VOC used in the coating or ink delivered to the applicator during the actual production day in kilograms per liter (pounds per gallon). If the coating or ink does not contain any VOCs, or if the actual VOC density cannot be demonstrated by the owner or oper-

ator, a value of 0.88 kilograms per liter (7.36 pounds per gallon) shall be used for P.

**History:** Renum. from NR 154.13 (4) (b) and am. Register, September, 1986, No. 369, eff. 10-1-86; renum. (1) to (3) to be (2) to (4) and am. (3) (a), (b) (intro.) and 1. and (4), cr. (1) and (3) (c), Register, February, 1990, No. 410, eff. 3-1-90; renum. (1) to be (1) (intro.) and am., cr. (1) (a) to (c), am. (2) (d) and (3) (c), r. and recr. (4), Register, December, 1993, No. 456, eff. 1-1-94; am. (1) (a) Register, August, 1994, No. 464, eff. 9-1-94; am. (4) Register, June, 1995, No. 474, eff. 7-1-95.

**NR 422.05 Can coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to coating applicators and ovens of sheet, can or end coating lines involved in sheet basecoat (exterior and interior) and overvarnish; 2-piece can exterior (basecoat and overvarnish) and 2- and 3-piece can interior body spray; 2-piece can exterior end (spray or roll coat); 3-piece can side-seam spray and end sealing compound operations. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a can coating line may cause, allow or permit the emission of any VOCs in excess of:

(a) 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, delivered to each coating applicator from sheet basecoat (exterior and interior) and overvarnish or 2-piece can exterior (basecoat and overvarnish) operations.

(b) 0.51 kilograms per liter of coating (4.2 pounds per gallon), excluding water, delivered to each coating applicator from 2- and 3-piece can interior body spray and 2-piece can exterior end (spray or roll coat) operations.

(c) 0.66 kilograms per liter of coating (5.5 pounds per gallon), excluding water, delivered to each coating applicator from 3-piece can side-seam spray operations.

(d) 0.44 kilograms per liter of coating (3.7 pounds per gallon), excluding water, delivered to each coating applicator from end sealing compound operations.

(3) **COMPLIANCE EXTENSIONS.** (a) Notwithstanding the emission limitations of sub. (2) and the provisions of s. NR 425.03, the department may extend until December 31, 1985 the deadline for compliance with the emission limitations of sub. (2), provided that:

1. The can coating operation is a sheet basecoat, exterior or interior, or overvarnish operation and, by itself or by the internal offset provisions of s. NR 425.05, meets an interim VOC emission limitation after December 31, 1982 of 0.48 kilograms per liter of coating (4.0 pounds per gallon), excluding water, delivered to each coating applicator, or

2. The can coating operation is an end sealing compound operation and, by itself or by the internal offset provisions of s. NR 425.05, meets an interim VOC emission limitation after December 31, 1982 of 0.52 kilograms per liter of coating (4.3 pounds per gallon), excluding water, delivered to each coating applicator, and

3. The owner or operator of the can coating facility submits a written request for a compliance extension under this subsection and shows, to



the department's satisfaction, that a compliance extension is necessary in order to comply with the emission limitations of sub. (2) through the use of low solvent content coating application technology.

(b) If, during the term of an extension granted under this subsection, the department determines that the can coating operation is not meeting its interim emission limitation, that advances in low solvent content coating application technology eliminate the need for the extension, or that the emission limitations of sub. (2) can be met without the use of energy intensive control devices, it may terminate the extension. Upon termination, the emission limitations of sub. (2) shall apply.

**History:** Renum. from NR 154.13 (4) (c) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), (3) (a) 1. and 2., Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.06 Coil coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the coating applicators, ovens and quench areas of coil coating lines involved in prime and topcoat or single coat operations. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a coil coating line may cause, allow or permit the emission of any VOCs in excess of 0.31 kilograms per liter of coating (2.6 pounds per gallon), excluding water, delivered to each coating applicator from prime and topcoat or single coat operations.

**History:** Renum. from NR 154.13 (4) (d) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.07 Paper coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the coating applicators, including but not limited to blade, air knife or roll coaters, and drying ovens of paper coating lines. This section does not apply to any piece of equipment on which a nonuniform coating is applied to a substrate, as in printing, or to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a paper coating line may cause, allow or permit the emission of any VOCs in excess of 0.35 kilograms per liter of coating (2.9 pounds per gallon), excluding water, delivered to each coating applicator from a paper coating line.

**History:** Renum. from NR 154.13 (4) (e) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.08 Fabric and vinyl coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the coating applicators, including but not limited to blade, roll, rotogravure or dip coaters, and drying ovens of fabric and vinyl coating lines. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a fabric coating line or a vinyl coating line may cause, allow or permit the emission of any VOCs in excess of:

(a) 0.35 kilograms per liter of coating (2.9 pounds per gallon), excluding water, delivered to each coating applicator from a fabric coating line.

(b) 0.45 kilograms per liter of coating (3.8 pounds per gallon), excluding water, delivered to each coating applicator from a vinyl coating line.

History: Renum. from NR 154.13 (4) (f) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.085 Leather coating.** (1) **APPLICABILITY.** Effective February 1, 1987, this section applies to coating applications at leather coating facilities. This section does not apply to sources exempted under s. NR 422.03 (6).

(2) **EMISSION LIMITATIONS.** No owner or operator of a leather coating facility may cause, allow or permit the emission of any VOCs from coating applications in excess of 18.6 kilograms per 100 square meters (38.0 pounds per 1000 square feet) of coated product calculated on a daily average basis.

(3) **COMPLIANCE REQUIREMENTS AND SCHEDULES.** The owner or operator of a leather coating facility shall comply with the requirements of sub. (4) and s. NR 425.03 (1), (8) and (9).

(4) **REPORTING AND RECORDKEEPING.** (a) To determine compliance with the leather coating VOC emission limit in this section, the facility shall maintain daily coating usage and leather production records in a format approved by the department. Reporting, recordkeeping and access to these records shall be in accordance with ss. NR 439.03 to 439.05.

(b) The daily VOC emission rate shall be determined by the following equation:

$$c = a/b$$

where:

c is the daily average VOC emission rate

a is the total amount of VOCs emitted during the day

b is the prorated surface area of leather coated during the day, where:

$$b = \sum_{i=1}^n d_i e_i$$

$d_i$  is the total area of the ith batch of hides coated during the day

$e_i$  is the ratio of actual VOC emissions resulting from coating any portion of the ith batch of hides during the day to the total predicted VOC emissions resulting from all coating of the entire ith batch

(c) The facility shall measure the surface area of each piece of leather coated with a mechanism initially calibrated for minimum accuracy to the Turner Korrekt Machine or Sawyer Measurement systems. The average surface area per coated piece of leather may be used for a batch of leather provided that the average is based on a minimum of 500 pieces. Otherwise, the facility average surface area per coated leather piece shall be used. In no case may the total area allocated to production over all days from a piece of leather exceed the average area for that leather.

History: Cr. Register, January, 1987, No. 373, eff. 2-1-87; am. (2) and (3), cr. (4), Register, February, 1990, No. 410, eff. 3-1-90.

Register, August, 1995, No. 476

**NR 422.09 Automobile and light-duty truck manufacturing.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03 (6), to the application areas, flashoff areas, and ovens of automobile and light-duty truck manufacturing plants involved in prime, topcoat and final repair coating of metallic front end and main body parts. This section does not apply to the coating of wheels, trunk interiors, steering columns or nonmetallic parts; to sealers or nonpriming anti-rust coatings; or to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS — ENAMELS.** No owner or operator of an automobile surface coating line which, prior to January 1, 1979, used an enamel coating system, may cause, allow or permit the emission of any VOCs in excess of:

(a) After December 31, 1983, 0.14 kilograms per liter of coating (1.2 pounds per gallon), excluding water, from an electrodeposition prime coat or equivalent coating line.

(b) After December 31, 1982, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a spray primer-surfacer coating line.

(c) After December 31, 1982, and until December 31, 1985, 0.45 kilograms per liter of coating (3.7 pounds per gallon), excluding water, from a topcoat coating line.

(d) After December 31, 1985, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a topcoat coating line.

(e) After December 31, 1982, 0.58 kilograms per liter of coating (4.8 pounds per gallon), excluding water, from any final repair coating line.

(3) **EMISSION LIMITATIONS — LACQUERS.** No owner or operator of an automobile surface coating line which, prior to January 1, 1979, used a lacquer coating system, may cause, allow or permit the emission of any VOCs in excess of:

(a) After August 1, 1979, and until December 31, 1982, 0.27 kilograms per liter of coating (2.2 pounds per gallon), excluding water, from an electrodeposition prime coat coating line.

(b) After December 31, 1982, 0.14 kilograms per liter of coating (1.2 pounds per gallon), excluding water, from an electrodeposition prime coat coating line.

(c) After December 31, 1980, and until December 31, 1986, 0.36 kilograms per liter of coating (3.0 pounds per gallon), excluding water, from a spray primer-surfacer coating line.

(d) After December 31, 1986, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a spray primer-surfacer coating line.

(e) After December 31, 1979, and until December 31, 1981, 0.70 kilograms per liter of coating (5.8 pounds per gallon), excluding water, from a topcoat coating line.

(f) After December 31, 1981, and until December 31, 1986, 0.61 kilograms per liter of coating (5.0 pounds per gallon), excluding water, from a topcoat coating line.

(g) After December 31, 1986, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a topcoat coating line.

(h) After August 1, 1979, and until December 31, 1986, 0.79 kilograms per liter of coating (6.5 pounds per gallon), excluding water, from any final repair coating line.

(i) After December 31, 1986, 0.58 kilograms per liter of coating (4.8 pounds per gallon), excluding water, from any final repair coating line.

(4) EMISSION LIMITATIONS — TRUCKS. No owner or operator of a light-duty truck surface coating line may cause, allow or permit the emission of any VOCs in excess of:

(a) After January 1, 1981, and until December 31, 1982, 0.27 kilograms per liter of coating (2.2 pounds per gallon), excluding water, from an electrodeposition prime coat coating line.

(b) After December 31, 1982, 0.14 kilograms per liter of coating (1.2 pounds per gallon), excluding water, from an electrodeposition prime coat coating line.

(c) After December 31, 1980, and until December 30, 1987, 0.41 kilograms per liter of coating (3.4 pounds per gallon), excluding water, from a spray primer-surfacer coating line.

(d) After December 31, 1987, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a spray primer-surfacer coating line.

(e) After December 31, 1982, and until December 30, 1987, 0.44 kilograms per liter of coating (3.6 pounds per gallon), excluding water, from a topcoat coating line.

(f) After December 31, 1987, 0.34 kilograms per liter of coating (2.8 pounds per gallon), excluding water, from a topcoat coating line.

(g) After December 31, 1982, 0.58 kilograms per liter of coating (4.8 pounds per gallon), excluding water, from any final repair coating line.

(5) EMISSION RATE AVERAGING. Each emission limit in this section may be interpreted as a weighted daily average, if specified in an approved compliance plan. The emission limits are referenced to waterborne coatings conventionally applied. Any coating line which achieves an equivalent emission rate per unit area coated shall be deemed in compliance.

History: Renum. from NR 154.13 (4) (g) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), (3) (intro.), (4) (intro.) and (5), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.095 Motor vehicle refinishing operations. (1) APPLICABILITY.** This section applies to motor vehicle refinishing operations performed in the following types of facilities in the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha: auto body and repair shops; production paint shops; new and used motor vehicle dealer repair and paint shops; fleet operator repair and paint shops; and any facility which coats vehicles and is classified under standard industrial classification code 7532, as described in the Standard Industrial Classification Manual, 1987, incorporated by reference in s. NR 484.05, including dock repair of imported vehicles and dealer repair of vehicles damaged in transit.

(2) **EXEMPTIONS.** (a) Motor vehicle refinishing operations at facilities which use less than 20 gallons per year of coatings are exempt from the equipment requirements in subs. (5) and (6) (e).

(b) The application of touch-up coatings is exempt from this section.

(c) Motor vehicle refinishing operations at educational institutions are exempt from the recordkeeping requirements under sub. (8).

(3) **NOTIFICATION.** (a) The owner or operator of a motor vehicle refinishing operation in existence on the effective date of this section, September 1, 1995, and subject to this section, shall submit a notification to the department, in writing, within 60 days of the effective date of this section, September 1, 1995, consisting of the following information:

1. Name, address and phone number of facility where refinishing operations are taking place.

2. Name and phone number of the responsible party at the facility.

(b) The owner or operator of a motor vehicle refinishing operation which becomes subject to this section after September 1, 1995, shall submit a written notification to the department containing the information specified in par. (a) within 30 days after becoming subject to this section.

**Note:** Notifications submitted under this subsection should be submitted to:

Wisconsin Department of Natural Resources  
Bureau of Air Management  
PO Box 7921  
Madison WI 53707-7921  
Attn: Compliance Section

(4) **EMISSION LIMITATIONS - COATINGS.** (a) After January 1, 1996, no owner or operator of a motor vehicle refinishing operation may refinish or allow the refinishing of any motor vehicles or their body parts and components using any coating or coating system with a VOC content in excess of that specified in Table 1. All coatings shall be used according to manufacturer's specifications.

Table 1

VOC Content Limitations for Coatings Used in Motor Vehicle Refinishing Operations

[kilograms/liter (pounds/gallon) of coating, excluding water, as applied]

Type of Coating	Maximum VOC Content
Pretreatment coat	0.78 (6.5)
Precoat	0.66 (5.5)
Prime coat/primer surfacers	0.58 (4.8)
Primer sealer	0.55 (4.6)
Topcoat or basecoat-clear coat system	0.60 (5.0)
Three or four stage topcoat system	0.63 (5.2)
Specialty coatings	0.84 (7.0)

(b) The VOC content of a basecoat-clear coat system shall be calculated according to the following formula:

$$\text{VOC}_{b/c} = [\text{VOC}_b + 2(\text{VOC}_c)]/3$$

where:

$\text{VOC}_{b/c}$  is the as applied VOC content of a basecoat-clear coat system in kilograms per liter (pounds per gallon), excluding water

$\text{VOC}_b$  is the as applied VOC content in kilograms per liter (pounds per gallon), excluding water, of the basecoat used

$\text{VOC}_c$  is the as applied VOC content in kilograms per liter (pounds per gallon), excluding water, of the clear coat used

(c) The VOC content for a 3 or 4 stage coating system shall be calculated according to the following formula:

$$\text{VOC}_T = [\text{VOC}_b + \sum_{m=1}^{N-2} \text{VOC}_m + 2(\text{VOC}_c)]/(N + 1)$$

where:

$\text{VOC}_T$  is the as applied VOC content of a basecoat, midcoat and clear coat system in kilograms per liter (pounds per gallon), excluding water

$\text{VOC}_b$  is the as applied VOC content in kilograms per liter (pounds per gallon), excluding water, of the basecoat used

$\text{VOC}_m$  is the as applied VOC content in kilograms per liter (pounds per gallon), excluding water, of each midcoat used

$\text{VOC}_c$  is the as applied VOC content in kilograms per liter (pounds per gallon), excluding water, of the clear coat used

N is 3 for a 3 stage coating system or 4 for a 4 stage coating system.

(5) **APPLICATION EQUIPMENT.** After January 1, 1996, no owner or operator of a motor vehicle refinishing operation may refinish or allow the refinishing of any motor vehicles or their body parts and components unless one of the following types of application equipment is used in accordance with the manufacturer's recommendations:

- (a) Electrostatic application equipment.
- (b) Low-pressure spray method application equipment.

(6) **SURFACE PREPARATION AND CLEANUP SOLVENT.** After January 1, 1996, the owner or operator of a motor vehicle refinishing operation shall:

- (a) On plastic substrates, use only surface preparation products with a VOC content of less than or equal to 0.78 kilograms per liter (6.5 pounds per gallon), as applied.
- (b) On non-plastic substrates, use only surface preparation products with a VOC content of less than or equal to 0.17 kilograms per liter (1.4 pounds per gallon), as applied.

(c) Use closed containers for the storage or disposal of applicators used to apply solvents for surface preparation or cleanup.

(d) Use closed containers for the storage of waste paint, spent solvent and sludge from spray gun cleaners or in-house distillation units until properly disposed. Proper disposal includes releasing wastes to a reclaiming or hazardous waste management facility licensed under ch. NR 680, or recycling with an in-house distillation unit.

(e) Clean spray equipment, including paint lines, with a device that recirculates or reuses the solvent during the cleaning process, except for the final rinse which may be done with clean solvent, and collects solvent in a closed container.

(f) For facilities exempt under sub. (2) (a) from the requirements of par. (e), collect solvent used to clean spray equipment and paint lines in a closed container for proper disposal.

(7) **SPECIALTY COATINGS.** No owner or operator of a motor vehicle refinishing operation may apply or allow the application of a specialty coating for any reason other than the manufacturer's intended purposes.

(8) **RECORDKEEPING REQUIREMENTS.** (a) In addition to the record-keeping requirements under s. NR 439.04, the owner or operator of any motor vehicle refinishing operation shall maintain records of the amount and category of each coating purchased each month, based on the categories in Table 1.

(b) All records required under this subsection shall be retained for the most recent consecutive 60 month period during which coating material was purchased and shall be made available for inspection by the department.

Note: The provisions of this subsection shall be revised or repealed after emission standards for motor vehicle refinishing operations have been promulgated by EPA and have become effective on a nationwide basis.

History: Cr. Register, August, 1995, No. 476, eff. 9-1-95.

**NR 422.10 Furniture metal coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the application areas, flashoff areas and ovens of furniture metal coating lines involved in prime and topcoat or single coating operations. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a furniture metal coating line may cause, allow, or permit the emission of any VOCs in excess of 0.36 kilograms per liter of coating (3.0 pounds per gallon), excluding water, delivered to each coating applicator from prime and topcoat or single coat operations.

History: Renum. from NR 154.13 (4) (h) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.11 Surface coating of large appliances.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to application areas, flashoff areas and ovens of large appliance coating lines involved in single, prime or topcoat coating operations. This section does not apply to:

(a) Sources exempted under s. NR 422.03.

(b) The use of quick-drying lacquers for repair of scratches and nicks that occur during assembly, provided that the volume of coating does not exceed 0.95 liters (1 quart) in any one 8-hour period for any appliance coating line.

(2) **EMISSION LIMITATIONS.** No owner or operator of a large appliance coating line may cause, allow or permit the emission of any VOCs in excess of 0.34 kilograms per liter of coating (2.8 pounds per gallon), exclud-

ing water, delivered to each coating applicator from single, prime or top-coat coating operations.

**History:** Renum. from NR 154.13 (4) (i) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.12 Magnet wire coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the ovens of magnet wire coating operations. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATION.** No owner or operator of a magnet wire coating oven may cause, allow or permit the emission of any VOCs in excess of 0.20 kilograms per liter of coating (1.7 pounds per gallon), excluding water, delivered to each coating applicator from magnet wire coating operations.

**History:** Renum. from NR 154.13 (4) (j) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.125 Wood furniture coating.** (1) **APPLICABILITY.** This section applies to the wood furniture finishing operations of any wood furniture manufacturing facility which is located in the county of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington or Waukesha, and whose maximum theoretical emissions of VOCs from all wood furniture finishing operations at the facility is greater than or equal to 25 tons per year.

(2) **EMISSION LIMITATIONS.** After September 1, 1996, no owner or operator of a wood furniture finishing operation may cause, allow or permit the emission of any VOCs in excess of the following limitations:

(a) *General limits.* Except as provided in par. (b), either of the following:

1. 0.8 kilograms per kilogram of solids (0.8 pounds per pound), as applied, for topcoats only.

**Note:** There is no restriction on the VOC content of the sealers used by those electing to comply under subd. 1.

2. 1.9 kilograms per kilogram of solids (1.9 pounds per pound), as applied, for sealers and 1.8 kilograms per kilogram of solids (1.8 pounds per pound), as applied, for topcoats.

(b) *Acid-cured alkyd amino coatings.* When the owner or operator is using acid-cured alkyd amino vinyl sealers or acid-cured alkyd amino conversion varnish topcoats, any of the following:

1. Where the sealer is an acid-cured alkyd amino vinyl sealer and the topcoat is an acid-cured alkyd amino conversion varnish topcoat, 2.3 kilograms per kilogram of solids (2.3 pounds per pound), as applied, for sealers and 2.0 kilograms per kilogram of solids (2.0 pounds per pound of solids), as applied, for topcoats.

2. Where the sealer is not an acid-cured alkyd amino vinyl sealer and the topcoat is an acid-cured alkyd amino conversion varnish topcoat, 1.9 kilograms per kilogram of solids (1.9 pounds per pound), as applied, for sealers and 2.0 kilograms per kilogram of solids (2.0 pounds per pound), as applied, for topcoats.

3. Where the sealer is an acid-cured alkyd amino vinyl sealer and the topcoat is not an acid-cured alkyd amino conversion varnish topcoat, 2.3 kilograms per kilogram of solids (2.3 pounds per pound), as applied, for



sealers and 1.8 kilograms per kilogram of solids (1.8 pounds per pound), as applied, for topcoats.

(c) *Strippable spray booth coatings*. 0.8 kilograms per kilogram of solids (0.8 pounds per pound) for strippable spray booth coatings, as applied.

(3) COMPLIANCE METHODS. (a) *Emission averaging*. In addition to using provisions of s. NR 422.04 or 425.05 to demonstrate compliance, an owner or operator may demonstrate compliance with the emission limitations in sub. (2) (a) and (b) by showing that total daily actual emissions calculated using Equation 2 are less than or equal to total daily allowable emissions calculated using Equation 1.

$$E_{ALL} = 0.9 \left[ \sum_{i=1}^n A_{TCi} S_{TCi} + \sum_{i=1}^n A_{SEi} S_{SEi} + \sum_{i=1}^n A_{WCi} S_{WCi} + \sum_{i=1}^n A_{BCi} S_{BCi} + \sum_{i=1}^n A_{STi} S_{STi} \right]$$

(Equation 1)

where:

$E_{ALL}$  is the total daily allowable VOC emissions from all coatings involved in the average in kilograms (pounds)

$i$  is a subscript denoting an individual coating

$n$  is the number of different wood furniture coatings in an individual coating category applied during the actual production day and which are involved in the average

$A_{TCi}$  is the lowest of the applicable emission limitation under sub. (2) (a) or (b), or other limitation imposed by permit, order or approval, or the actual emission rate, as of the date of the notification required under sub. (5), in kilograms VOC per kilogram solids (pounds VOC per pound solids), for topcoat  $i$  as delivered to the applicator

$S_{TCi}$  is the total amount of solids in topcoat  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{SEi}$  is the lowest of the applicable emission limitation under sub. (2) (a) or (b), or other limitation imposed by permit, order or approval, or the actual emission rate, as of the date of the notification required under sub. (5), in kilograms VOC per kilogram solids (pounds VOC per pound solids), for sealer  $i$  as delivered to the applicator

$S_{SEi}$  is the total amount of solids in sealer  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{WCi}$  is the lowest of 9.0, or other limitation imposed by permit, order or approval, or the actual emission rate, as of the date of the notification required under sub. (5), in kilograms VOC per kilogram solids (pounds VOC per pound solids), for washcoat  $i$  as delivered to the applicator

$S_{WCi}$  is the total amount of solids in washcoat  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{BCi}$  is the lowest of 1.2, or other limitation imposed by permit, order or approval, or the actual emission rate, as of the date of the notification required under sub. (5), in kilograms VOC per kilogram solids (pounds VOC per pound solids), for basecoat  $i$  as delivered to the applicator

$S_{BCi}$  is the total amount of solids in basecoat  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{STi}$  is the lowest of 0.791, or other limitation imposed by permit, order or approval, or the actual emission rate, as of the date of the notification required under sub. (5), in kilograms VOC per liter (pounds VOC per gallon), for stain  $i$  as delivered to the applicator

$S_{STi}$  is the total amount of stain  $i$ , in liters (gallons), delivered to the applicator during the actual production day

$$E_{ACT} = \left[ \sum_{i=1}^n A_{TCi} S_{TCi} + \sum_{i=1}^n A_{SEi} S_{SEi} + \sum_{i=1}^n A_{WCi} S_{WCi} + \sum_{i=1}^n A_{BCi} S_{BCi} + \sum_{i=1}^n A_{STi} S_{STi} \right]$$

(Equation 2)

where:

$E_{ACT}$  is the total daily actual VOC emissions from all coatings involved in the average in kilograms (pounds)

$i$  is a subscript denoting an individual coating

$n$  is the number of different wood furniture coatings in an individual coating category applied during the actual production day and which are involved in the average

$A_{TCi}$  is the actual VOC content of topcoat  $i$ , in kilograms VOC per kilogram solids (pounds VOC per pound solids), as delivered to the applicator during the actual production day

$S_{TCi}$  is the total amount of solids in topcoat  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{SEi}$  is the actual VOC content of sealer  $i$ , in kilograms VOC per kilogram solids (pounds VOC per pound solids), as delivered to the applicator during the actual production day

$S_{SEi}$  is the total amount of solids in sealer  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{WCi}$  is the actual VOC content of washcoat  $i$ , in kilograms VOC per kilogram solids (pounds VOC per pound solids), as delivered to the applicator during the actual production day

$S_{WCi}$  is the total amount of solids in washcoat  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{BCi}$  is the actual VOC content of basecoat  $i$ , in kilograms VOC per kilogram solids (pounds VOC per pound solids), as delivered to the applicator during the actual production day

$S_{BCi}$  is the total amount of solids in basecoat  $i$ , in kilograms (pounds), delivered to the applicator during the actual production day

$A_{STi}$  is the actual VOC content of stain  $i$ , in kilograms VOC per liter (pounds VOC per gallon), as delivered to the applicator during the actual production day

$S_{STi}$  is the total amount of stain  $i$ , in liters (gallons), delivered to the applicator during the actual production day

(b) *Capture systems.* Notwithstanding s. NR 422.04 (4), an owner or operator demonstrating compliance with the emission limitations in sub. (2) as allowed under s. NR 422.04 (2) (c) shall do all of the following:

1. Determine the overall control efficiency needed to demonstrate compliance daily using Equation 3.

$$R = ((C - E)/C) (100) \quad (\text{Equation 3})$$

where:

R is the overall efficiency of the control system needed to demonstrate compliance on a daily basis, expressed as a percentage

C is the highest VOC content of all coatings subject to this paragraph on any given day in kilograms per kilogram of coating solids (pounds per pound of coating solids), as applied

E is the emission limitation applicable to the coating in kilograms per kilogram of coating solids (pounds per pound of coating solids), as applied

2. Document that the value of C in Equation 3 is obtained from the VOC and solids content of the as applied finishing material.

3. Comply with the requirements, and determine the actual overall efficiency of the control device, using the procedures of ss. NR 439.055, 439.06, 439.07 and 439.075.

4. Demonstrate compliance when R as determined under subd. 1. is greater than or equal to the overall efficiency of the control device determined under subd. 3.

(4) APPLICATION TECHNOLOGY. An owner or operator of a wood furniture manufacturing facility shall only apply finishing materials using electrostatic application, flow coating, dip coating, a low-pressure spray method, paint brush, hand roller or roll coater with the following exceptions:

(a) When applying finishing materials that have an as applied VOC content no greater than 1.0 kilogram per kilogram of solids (1.0 pound per pound of solids).

(b) When applying final touch-up and repair finishing materials.

(c) When using a control device to meet the applicable requirements of this section.

(5) INITIAL COMPLIANCE CERTIFICATION AND NOTIFICATION REQUIREMENTS. (a) *Emission limitations.* Any owner or operator subject to this section shall submit a written notification to the department within 60 days after the compliance deadline in sub. (2), or upon changing the method of operation when such a change would result in a change in the emission limitations applicable under sub. (2). The notification shall contain:

1. The name and location of the facility.

2. The name or identification number of all finishing operations subject to this section and the applicable emission limitations.

3. Certification that all wood furniture finishing operations are in compliance with the applicable emission limitations.

(b) *Emission averaging.* Any owner or operator of a wood furniture manufacturing facility achieving compliance with the emission limitations of sub. (2) by means of the emission averaging method allowed under sub. (3) (a) shall notify the department by 60 days prior to the

compliance deadline in sub. (2), upon startup of a new finishing operation, or upon changing the method of compliance to sub. (3) (a). The notification shall contain:

1. The name and location of the facility.
2. The name or identification number of each coating which will participate in the average and the coating line or lines on which it will be applied.
3. A description of the method by which the owner or operator will measure or calculate the kilograms (pounds) of solids or liters (gallons) of finishing material applied each day.
4. An example of the format in which the records required under sub. (6) will be kept.

(6) **RECORDKEEPING REQUIREMENTS.** In addition to the applicable requirements in s. NR 439.04, any owner or operator subject to this section shall collect and record the following information for each coating line or finishing operation:

(a) A unique name or identification number for each affected finishing material and strippable spray booth coating.

(b) The VOC content of each affected finishing material, as applied, and each strippable spray booth coating, as applied, in units of kilograms VOC per kilogram of solids (pounds VOC per pound of solids).

(c) If compliance is being achieved under the provisions of sub. (3) (a), the total daily actual and allowable VOC emissions as calculated using the equations in sub. (3) (a) and all information used in the calculations.

(d) Notwithstanding s. NR 439.04 (5) (e), if compliance is being achieved with the emission limitations in sub. (2) by the use of a control device, all of the following:

1. The overall efficiency of the control system needed to demonstrate compliance as determined under sub. (3) (b) on a daily basis.
2. The actual overall efficiency of the control system as determined under sub. (3) (b).
3. On a daily basis, the compliance status of all finishing operations achieving compliance under sub. (3) (b).
4. Control device monitoring data.
5. A log of operating times for the capture system, control device, monitoring devices and the associated coating line or operation.
6. The maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed and including dates and duration of any outages.

History: Cr. Register, August, 1995, No. 476, eff. 9-1-95.

**NR 422.127 Use of adhesives.** (1) **APPLICABILITY.** This section applies to the use of adhesives or adhesive primers on wood furniture, office partitions, or wood entry or passage doors process lines in any facility which is involved in the manufacturing of wood furniture, office partitions, or wood entry or passage doors. This section does not apply to either of the following:

- (a) Furniture metal coating lines subject to s. NR 422.10.

(b) Miscellaneous metal parts and products coating lines subject to s. NR 422.15.

(2) EXEMPTIONS. The emission limitations in sub. (3) do not apply to any of the following:

(a) A facility which is located outside the counties of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha.

(b) A facility which has total emissions of VOCs from the use of adhesives and adhesive primers of less than 50 pounds per month when averaged over any 12 consecutive months.

(c) An emissions unit which never applies more than one pint of adhesives in a day.

(3) EMISSION LIMITATIONS. (a) After June 30, 1996, no owner or operator of a facility which is subject to this subsection may cause, allow or permit the use of any adhesive or adhesive primer unless it meets one of the following conditions:

1. The adhesive or adhesive primer has a solids content greater than or equal to 23% by weight, as applied.

2. The adhesive or adhesive primer does not result in the emission of any VOCs in excess of 0.54 kilogram per liter (4.5 pounds per gallon) of adhesive or adhesive primer, excluding water, delivered to an applicator that applies adhesive or adhesive primer.

(b) Subject to natural resources board approval, after May 1, 1999, no owner or operator of a facility which is subject to this subsection may cause, allow or permit the emission of any VOCs in excess of 0.54 kilogram per liter (4.5 pounds per gallon) of adhesive or adhesive primer, excluding water, delivered to an applicator that applies adhesive or adhesive primer.

(4) RECORDKEEPING REQUIREMENTS. (a) The owner or operator of any facility that is exempt under sub. (2) (b) shall collect and record the following information to support the exemption:

1. A unique name or identification number for each adhesive and adhesive primer used.

2. The VOC content of each adhesive and adhesive primer, as applied, in units of pounds per gallon, excluding water.

3. The volume of each adhesive and adhesive primer used per month, as applied, in units of gallons, excluding water.

4. The total VOC emissions from adhesives and adhesive primers used in units of pounds per month.

(b) The owner or operator of any facility that claims an exemption under sub. (2) (c) shall collect and record the volume of adhesives applied per day for each emissions unit for which an exemption is claimed.

(c) In addition to the applicable requirements in s. NR 439.04, the owner or operator of any facility subject to sub. (3) shall collect and record the following information, as applicable:

1. A unique name or identification number for each adhesive and adhesive primer used.

2. The VOC content of each adhesive and adhesive primer, as applied, in units of kilograms per liter (pounds per gallon), excluding water.

3. The percent solids by weight in each adhesive or adhesive primer, as applied.

(d) Records required under this subsection shall be maintained for a period of 5 years.

History: Cr. Register, August, 1995, No. 476, eff. 9-1-95.

**NR 422.13 Flat wood panel coating.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the coating lines of flat wood panel facilities involved in the surface coating of printed interior panels made of hardwood plywood and thin particleboard, natural finish hardwood plywood panels, or hardboard paneling with class II finishes. This section does not apply to the manufacture of exterior siding, tileboard, or particleboard used as a furniture component; or to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a flat wood panel coating line may cause, allow or permit the emission of any VOCs from a coating application system in excess of:

(a) 2.9 kilograms per 100 square meters of coated finished product (6.0 pounds per 1,000 square feet) from printed interior panels, regardless of the number of coats applied.

(b) 5.8 kilograms per 100 square meters of coated finished product (12.0 pounds per 1,000 square feet) from natural finish hardwood plywood panels, regardless of the number of coats applied.

(c) 4.8 kilograms per 100 square meters of coated finished product (10.0 pounds per 1,000 square feet) from class II finishes on hardboard panels, regardless of the number of coats applied.

History: Renum. from NR 154.13 (4) (k), Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.132 Wood door coating.** (1) **APPLICABILITY.** Except as provided in pars. (a) to (c), this section applies to the wood entry or passage door coating lines of any wood entry or passage door coating facility. This section does not apply to any of the following:

(a) A facility which is exempt under s. NR 422.03 (9).

(b) Flat wood panel coating lines subject to s. NR 422.13.

(c) Adhesives and adhesive primers subject to s. NR 422.127.

(2) **EMISSION LIMITATIONS AND APPLICATION REQUIREMENTS.** (a) No owner or operator of an automated wood entry or passage door coating line may cause, allow or permit the emission of any VOCs in excess of:

1. 0.77 kilograms per liter (6.9 pounds per gallon) of coating, excluding water, delivered to an applicator that applies any coating on or after May 31, 1995, but before May 1, 1997.

2. 0.64 kilograms per liter (5.7 pounds per gallon) of coating, excluding water, delivered to an applicator that applies any coating on or after May 1, 1997.

(b) An owner or operator of a wood entry or passage door coating facility shall only apply coatings using electrostatic application, flow coating, dip coating, a low-pressure spray method, paint brush, hand roller or roll

coater. All applications equipment shall be in proper operating condition and used in accordance with proper operating procedures.

(3) **RECORDKEEPING REQUIREMENTS.** Any facility subject to this section shall comply with the requirements applicable under s. NR 439.04 (5).

History: Cr. Register, August, 1994, No. 464, eff. 9-1-94; r. and recr. (1) (c), Register, August, 1995, No. 476, eff. 9-1-95.

**NR 422.135 Molded wood parts or products.** (1) **APPLICABILITY.** Except as provided in pars. (a) and (b), this section applies to molded wood parts or products coating lines of any molded wood parts or products coating facility. This section does not apply to either of the following:

(a) A facility which is exempt under s. NR 422.03 (8).

(b) The use of topcoats which are applied as a stripe not more than ½ inch in width to croquet balls and whose use in aggregate never exceeds 500 gallons per year, as applied.

(2) **EMISSION LIMITATIONS.** (a) No owner or operator of a molded wood parts or products coating facility which uses flow coating to apply topcoats may cause, allow or permit the emission of any VOCs in excess of the limitations specified in Table 1.

Table 1  
 Emission Limitations For Facilities Using Flow Coating  
 To Apply Topcoats

[kilograms per liter (pounds per gallon) of coating, excluding water,  
 delivered to a coating applicator]

Coating	Between May 30, 1995 and May 1, 1997	On and After May 1, 1997
White pigmented prime coating	0.30 (2.5)	0.30 (2.5)
Tinted pigmented prime coating	0.33 (2.75)	0.33 (2.75)
Topcoat	0.64 (5.3)	0.42 (3.5)

(b) No owner or operator of a molded wood parts or products coating facility which applies a topcoat using any application method other than flow coating may cause, allow or permit the emission of any VOCs in excess of the limitations specified in Table 2.

Table 2  
 Emission Limitations For Facilities Using Application Methods Other  
 Than Flow Coating To Apply Topcoats

[kilograms per liter (pounds per gallon) of coating, excluding water,  
 delivered to a coating applicator]

Coating	Between May 30, 1995 and November 15, 1996	On and After November 15, 1996
Prime coat	0.71 (5.9)	0.30 (2.5)
Topcoat	0.42 (3.5)	0.42 (3.5)

(3) **RECORDKEEPING REQUIREMENTS.** Any facility subject to this section shall comply with the requirements applicable under s. NR 439.04 (5).

History: Cr. Register, August, 1994, No. 464, eff. 9-1-94.

Register, August, 1995, No. 476

**NR 422.14 Graphic arts. (1) APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to the printing lines of all packaging rotogravure publication rotogravure, and flexographic printing facilities. This section does not apply to sources exempted under s. NR 422.03.

(2) **EMISSION LIMITATIONS.** No owner or operator of a packaging rotogravure, publication rotogravure, or flexographic printing line may operate, or cause, allow or permit the operation of the line unless:

(a) The volatile fraction of ink, as it is applied to the substrate, contains 25% by volume or less of VOC and 75% by volume or more of water;

(b) The ink, as it is applied to the substrate, less water, contains 60% by volume or more nonvolatile material; or

(c) The owner or operator installs and operates:

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

2. An incineration or catalytic oxidation system, provided that 90% by weight of the VOCs, VOC measured as total combustible carbon, which enter the incinerator or oxidation unit are oxidized to nonorganic compounds; or

3. An alternative VOC emission reduction system demonstrated to have at least a 90% reduction efficiency, as measured across the control system, and approved by the department. Any approval granted by the department under this subdivision shall be submitted to, and will not become effective for federal purposes until approved by, the administrator of the U.S. environmental protection agency or designee as a source-specific revision to the department's state implementation plan for ozone.

(3) **CONTROL SYSTEM.** The overall emission reduction efficiency of any capture system and control device used in conjunction with sub. (2) (c) shall be at least:

(a) 75% where a publication rotogravure process is employed.

(b) 65% where a packaging rotogravure process is employed.

(c) 60% where a flexographic printing process is employed.

**History:** Renum. from NR 154.13 (2) (1) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (intro.), Register, February, 1990, No. 410, eff. 3-1-90; am. (2) (a), (c) 2. and 3., (3) (intro.), (b) and (c), Register, December, 1993, No. 456, eff. 1-1-94.

**NR 422.142 Lithographic printing (1) APPLICABILITY.** (a) This section applies to all lithographic printing presses at any facility which is located in the county of Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington or Waukesha and which has maximum theoretical emissions of VOCs from all lithographic printing presses at the facility greater than or equal to 755.7 kilograms (1666 pounds) in any month.

(b) To determine VOC emissions under par. (a), the VOC content of a lithographic ink shall be multiplied by 0.8 for a heatset ink, or multiplied by 0.05 for a non-heatset ink, to account for VOC retention on the substrate.

(2) **EMISSION LIMITATIONS.** (a) *Dryer exhaust.* Any person who owns or operates a heatset web lithographic printing press shall maintain the Register, August, 1995, No. 476



dryer pressure lower than the press room pressure at all points inside the dryer, and shall:

1. Reduce VOC emissions from the press dryer exhaust by 90% by weight of total organics, minus methane and ethane, or maintain a maximum dryer exhaust outlet concentration of 20 ppmv, as carbon.

2. If the dryer exhaust is controlled by a catalytic incinerator installed or modified before January 1, 1982, reduce VOC emissions from the press dryer exhaust by 85% by weight of total organics, minus methane and ethane.

(b) *Fountain solutions.* 1. 'Heatset web presses.' Any person who owns or operates a heatset web lithographic printing press shall, when printing on a substrate other than metal, metal-foil or plastic, use a fountain solution which has a VOC content as applied of no more than one of the following:

a. 1.6% by weight if the fountain solution contains any restricted alcohol and is not refrigerated to 60° F or less.

b. 3.0% by weight if the fountain solution contains any restricted alcohol and is refrigerated to 60° F or less.

c. 5.0% by weight if the fountain solution contains no restricted alcohol.

2. 'Non-heatset web presses.' Any person who owns or operates a non-heatset web lithographic printing press shall, when printing on a substrate other than metal, metal-foil or plastic, use a fountain solution which has a VOC content as applied of no more than 5.0% by weight and which contains no restricted alcohol.

3. 'Sheet-fed presses.' Any person who owns or operates a sheet-fed lithographic printing press shall, when printing on a substrate other than metal, metal-foil or plastic, use a fountain solution which has a VOC content as applied of no more than one of the following:

a. 5.0% by weight.

b. 8.5% by weight if the fountain solution is refrigerated to 60° F or less.

4. 'Metal, metal-foil or plastic substrates.' Any person who owns or operates any lithographic printing press shall, when printing on a metal, metal-foil or plastic substrate, use a fountain solution which has a VOC content as applied of no more than one of the following:

a. 13.5% by weight if the fountain solution contains any restricted alcohol and is refrigerated to 60° F or less.

b. Not more than that allowed under subd. 1. a. or c., 2. or 3. a., as appropriate for the type of press operated.

(c) *Blanket or roller wash.* 1. Except as provided in subd. 2., any person who owns or operates any lithographic press shall use blanket or roller wash which, as applied, has one of the following:

a. A VOC content of no greater than 30% by weight.

b. A vapor pressure for each VOC component of less than or equal to 10 mm of Hg at 20° C (68° F).

2. The owner or operator of a facility may use blanket or roller wash which does not meet the emission limitations of subd. 1., provided the amount used at the facility under this subdivision over any 12 consecutive months does not exceed one of the following:

- a. If the facility does not print on a plastic substrate, 55 gallons.
- b. If the facility does print on a plastic substrate, 165 gallons.

(3) **TEMPERATURE MONITORING.** The owner or operator of any lithographic printing press shall monitor at least once each 8-hour shift the temperature of each fountain solution reservoir for any fountain solution subject to sub. (2) (b) 1. b., 3. b. or 4. a.

(4) **RECORDKEEPING REQUIREMENTS.** In addition to the applicable recordkeeping requirements in s. NR 439.04, the owner or operator of any lithographic printing press shall collect and record the applicable information specified in this subsection. The information shall be maintained at the facility for a minimum of 5 years and shall be made available to an authorized department representative at any time during normal working hours. The information required is:

(a) For a heatset web lithographic printing press using a control device, for each day of operation:

1. Control device monitoring data.
2. A log of operating time for the control device, monitoring equipment and the associated printing line or operation.
3. A maintenance log for the control device and monitoring equipment detailing all routine and non-routine maintenance performed and including dates and duration of any outages.

(b) For fountain solutions monitored under sub. (3), the fountain solution reservoir temperature for each 8-hour shift of operation.

(c) For each fountain solution used, the percent by weight VOC content as applied, and the chemical name of each restricted alcohol.

(d) For each blanket or roller wash, the percent by weight VOC content as applied and the vapor pressure of each VOC component.

(e) For each month of operation, the volume of all blanket or roller wash used which does not meet the emission limitations of sub. (2) (c) 1., as allowed under sub. (2) (c) 2.

(5) **COMPLIANCE TESTING.** (a) The owner or operator of a heatset web lithographic printing press shall demonstrate compliance with the appropriate destruction efficiency or emission rate in sub. (2) (a) by performing compliance emission tests on each control device. The initial emission tests shall be performed by the compliance deadline in sub. (6) (a). Each emission test shall follow the methods and procedures listed in s. NR 439.07. Method 18, 25 or 25A in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04, shall be used to determine the VOC concentration at the sampling points. Method 25A may not be used if the outlet VOC concentration is greater than 100 ppmv, as carbon. When determining the VOC concentration, the probe must be heated during testing to at least the exhaust gas stream temperature.

(b) The owner or operator of a heatset web lithographic printing press shall perform the compliance emission tests required under par. (a) according to one of the following test schedules:

1. Any facility with allowable VOC emissions from lithographic printing presses of 100 tons or more per year shall perform an emission test which demonstrates compliance with sub. (2) (a) every 24 months. Each biennial test shall be performed within 90 days of the anniversary date of the initial emission test.

2. Any facility with allowable VOC emissions from lithographic printing presses of less than 100 tons per year shall perform an emission test which demonstrates compliance with sub. (2) (a) every 48 months. Each test shall be performed within 90 days of the anniversary date of the initial emission test.

(c) The VOC content of lithographic inks, fountain solutions and blanket or roller wash shall be determined in accordance with s. NR 439.06 (3) (j).

(d) The vapor pressure of each VOC in blanket or roller wash shall be determined by ASTM D2879-92, incorporated by reference in s. NR 484.10.

(6) **COMPLIANCE SCHEDULE AND CERTIFICATION REQUIREMENTS.** (a) *Compliance schedule.* The owner or operator of a lithographic printing press installed on or before July 1, 1996 shall achieve compliance with the applicable emission limitations of sub. (2) by July 1, 1996. Any person who installs a lithographic printing press after July 1, 1996 shall comply with the applicable emission limitations upon startup of the press.

(b) *Certification.* 1. The owner or operator of a lithographic printing press which is installed on or before July 1, 1996 shall submit to the department no later than September 1, 1996 written certification that the press is in compliance with the applicable requirements of subs. (2) and (3) and shall provide a demonstration of compliance in accordance with subs. (4) and (5). A compliance emission test performed in accordance with s. NR 439.07 no more than 2 years prior to the compliance deadline, which demonstrates compliance with sub. (2) (a), is acceptable as a demonstration of compliance in accordance with sub. (5).

2. The owner or operator of a heatset web lithographic printing press which is installed after July 1, 1996 shall perform a compliance emission test within 180 days after installation and shall submit to the department no later than 60 days after the test written certification that the press is in compliance with the applicable requirements of subs. (2) and (3) and a demonstration of compliance in accordance with subs. (4) and (5).

3. The owner or operator of any lithographic printing press, other than a heatset web press, which is installed after July 1, 1996 shall submit to the department no later than 180 days after installation written certification that the press is in compliance with the applicable requirements of subs. (2) and (3) and a demonstration of compliance in accordance with subs. (4) and (5).

History: Cr. Register, June, 1995, No. 474, eff. 7-1-95.

**NR 422.145 Screen printing (1) APPLICABILITY.** This section applies to all screen printing units at screen printing facilities which are not exempt facilities under s. NR 422.03 (4m).

(2) **EMISSION LIMITATIONS.** (a) *General.* No owner or operator of a screen printing unit may cause, allow or permit the emission of any VOCs in excess of 0.40 kilograms per liter (3.3 pounds per gallon) of ink

or coating, excluding water, delivered to an applicator, except as provided in pars. (b) and (c).

(b) *Special purpose inks and coatings.* No owner or operator of a screen printing unit using a special purpose ink or coating may cause, allow or permit the emission of any VOCs in excess of 0.80 kilograms per liter (6.7 pounds per gallon) of special purpose ink or coating, excluding water, delivered to an applicator.

(c) *Roll coating.* No owner or operator of a screen printing unit may cause, allow or permit the emission of any VOCs in excess of 0.80 kilograms per liter (6.7 pounds per gallon), excluding water, delivered to a roll coating applicator associated with screen printing.

(d) *Screen reclamation.* No owner or operator of a screen printing unit may cause, allow or permit the emission of any VOCs in excess of 0.24 kilograms per square meter (0.050 pounds per square foot) of screen reclaimed, calculated on a daily average basis for each day of operation using the following equation:

$$C = A/B$$

where:

C is the daily average VOC emission rate, in kilograms per square meter (pounds per square foot), from all screen reclamation at a screen printing facility

A is the amount of VOCs used in all screen reclamation at a screen printing facility during a day, in kilograms (pounds), except that any VOCs directed into containers that prevent evaporation may be subtracted

B is the surface area of all screens reclaimed during a day, in square meters (square feet)

(3) **COMPLIANCE DEADLINE.** The owner or operator of a screen printing unit subject to this section on which construction or modification commenced before July 1, 1994 shall achieve final compliance with the emission limitations of sub. (2) not later than May 31, 1995. Any source which is subject to this section and on which construction or modification commenced on or after July 1, 1994 shall meet the emission limitations of sub. (2) upon startup.

(4) **RECORDKEEPING.** The owner or operator of a screen printing unit subject to this section shall collect and record the information required in s. NR 439.04 (5) (a). In addition, the owner or operator shall collect and record all of the following information for screen reclamation at the facility for each day of operation:

(a) The daily average VOC emission rate from screen reclamation in kilograms per square meter (pounds per square foot) of screen reclaimed as calculated using the equation in sub. (2) (d).

(b) The amount of VOCs emitted during the day from screen reclamation in kilograms (pounds).

(c) The total surface area of screens reclaimed during the day in square meters (square feet).

History: Cr. Register, June, 1994, No. 462, eff. 7-1-94.

**NR 422.15 Miscellaneous metal parts and products.** (1) **APPLICABILITY.** This section applies, subject to the provisions of s. NR 425.03, to all coat-Register, August, 1995, No. 476

ing line application areas, conveyors, flashoff areas, drying areas, forced air driers and ovens of any industry categorized under the 2-digit major groups of 33 to 39 as described in the Standard Industrial Classification Manual, 1987, incorporated by reference in s. NR 484.05, which are involved in the surface coating of miscellaneous metal parts and products with the following exceptions:

- (a) Coating of airplane exteriors.
- (b) Coating of marine vessels.
- (c) Automobile refinishing.
- (d) Customized topcoating of automobiles and trucks if production is less than 35 vehicles per day.
- (e) Adhesives and materials used to prepare a surface for adhesives at facilities located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha.
- (g) Sealants or fillers whose purpose is to seal or fill seams, joints, holes and minor imperfections of surfaces, and which are applied at facilities located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha.
- (h) Coating lines covered under ss. NR 422.05 to 422.12.
- (i) Sources exempted under s. NR 422.03.
- (j) Silk screening of metal parts and products at facilities located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha.
- (k) Coating operations subject to s. NR 422.155.

(2) EMISSION LIMITATIONS — CURED COATINGS. No owner or operator of a miscellaneous metal parts or products coating line using a baked or specially cured coating technology may cause, allow or permit the emission of any VOCs in excess of:

- (a) 0.52 kilograms per liter (4.3 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coatings.
- (b) 0.42 kilograms per liter (3.5 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies extreme performance coatings.
- (c) 0.36 kilograms per liter (3.0 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.

(3) EMISSION LIMITATIONS — AIR DRIED COATINGS. No owner or operator of a miscellaneous metal parts or products coating line using an air dried coating technology may cause, allow or permit the emission of any VOCs in excess of:

- (a) After December 31, 1982, 0.58 kilograms per liter (4.8 pounds per gallon) of any coating, excluding water, delivered to a coating applicator.

(b) After December 31, 1985, 0.52 kilograms per liter (4.3 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coatings.

(c) After December 31, 1985, 0.42 kilograms per liter (3.5 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.

(4) **EMISSION LIMITATIONS — PRETREATMENT COATS.** This subsection applies to miscellaneous metal parts and products coating lines which are located outside the counties of Door, Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington and Waukesha. No owner or operator of a miscellaneous metal parts or products coating line may cause, allow or permit the emission of any VOCs in excess of 0.78 kilograms per liter (6.50 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies pretreatment coats. Coatings subject to this subsection may not participate in an internal offset under s. NR 425.05 or generate emission reduction credits in an emission reduction option.

(5) **EMISSION LIMITATIONS AND REQUIREMENTS — HIGH PERFORMANCE ARCHITECTURAL COATINGS.** This subsection applies to miscellaneous metal parts and products coating lines which were involved in the application of high performance architectural coatings, prior to July 1, 1983, and are 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.

(a) No owner or operator of a miscellaneous metal parts or products coating line which applies a high performance architectural coating may cause, allow or permit the emission of any VOCs from the coating in excess of:

1. 0.65 kilograms per liter (5.4 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies prime coatings.

2. 0.70 kilograms per liter (5.8 pounds per gallon) of coating, excluding water, delivered to a coating applicator for all other coatings.

(b) The owner or operator of a miscellaneous metal parts and products coating line may demonstrate compliance with the emission limits of this subsection by demonstrating, on a daily basis, that the combined emission rate from all high performance architectural coatings is less than or equal to the allowable emission rate as determined by the equation in s. NR 425.05 (2) (b) 2.

(6) **CHANGE IN TECHNOLOGY.** Miscellaneous metal parts or products coating lines which, prior to January 1, 1980, used a baked or specially cured coating technology shall meet the emission limitations of sub. (2) notwithstanding the coating technology presently in use.

(7) **MULTIPLE LIMITATIONS.** If more than one emission limitation in sub. (2) applies to a specific coating, then the least stringent emission limitation shall be applied.

(8) **SOLVENT WASHINGS.** All VOC emissions from solvent washings shall be considered in the emission limitations in subs. (2) and (3), unless the used wash solvent is directed into containers that prevent evaporation into the atmosphere.

(1) (h) and (i), cr. (1) (j), Register, April, 1989, No. 400 eff. 5-1-89; am. (1) (i) and (j), cr. (1) (k), Register, August, 1989, No. 404, eff. 9-1-89; am. (1) (b), (2) (intro.) and (3) (intro.), r. (1) (f), renum. (4) to (7) to be (5) to (8) and am. (5) (b), cr. (4), Register, February, 1990, No. 410, eff. 3-1-90; am. (1) (intro.), (e), (g) and (j), (4), (5) (intro.) and (b), Register, December, 1993, No. 456, eff. 1-1-94; am. (1) (intro.), Register, August, 1995, No. 476, eff. 9-1-95.

**NR 422.155 Fire truck and emergency response vehicle manufacturing.**

(1) **APPLICABILITY.** This section applies to coating operations of fire truck and emergency response vehicle manufacturing where meeting applicable emission limits in s. NR 422.15 is not technologically or economically feasible and where total facility production of fire trucks and emergency response vehicles is less than 35 vehicles per day.

(2) **EMISSION LIMITATIONS.** No owner or operator of a fire truck or emergency response vehicle coating operation may cause, allow or permit the emission of any VOCs in excess of:

(a) 0.80 kilograms per liter (6.68 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies pretreatment coats.

(b) 0.53 kilograms per liter (4.44 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies prime coats.

(c) 0.72 kilograms per liter (6.00 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies topcoats.

(d) 0.42 kilograms per liter (3.50 pounds per gallon) of coating, excluding water, delivered to a coating applicator that applies clear coats.

(3) **SOLVENT WASHINGS.** All VOC emissions from solvent washings shall be considered in the emission limitations in sub. (2), unless the used wash solvent is directed into containers that prevent evaporation into the atmosphere.

(4) **INTERNAL OFFSETS.** Coating operations subject to this section may not be involved in an internal offset under s. NR 425.05.

History: Cr. Register, August, 1989, No. 404, eff. 9-1-89; am. (2) (a) to (d) and (4), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.16 Use of asphalt surfacing materials.** (1) **APPLICABILITY.** This section applies to the mixing, storage, use and application of cutback asphalts in Wisconsin. This section does not apply to cutback asphalts intended for uses other than application to surfaces traversed by motor vehicles, bicycles or pedestrians.

(2) **RESTRICTED MATERIALS.** The following restrictions apply to the mixing, open storage, use or application of cutback asphalts during the ozone season:

(a) The use of rapid curing cutback asphalts containing gasoline or naphtha as the diluent is prohibited.

(b) The use of cutback asphalts not prohibited under par. (a) is prohibited except for:

1. Application of a single coat of liquid asphalt to an aggregate base to control dust.

2. Use as a penetrating prime coat during the first and last months of the ozone season.

History: Renum. from NR 154.13 (5) (a) and am. Register, September, 1986, No. 369, eff. 10-1-86; am. (2) (a) and (b), r. (2) (c), Register, February, 1990, No. 410, eff. 3-1-90.

**NR 422.17 Application of traffic marking materials.** (1) **APPLICABILITY.** This section applies after April 30, 1996, to the application of traffic marking material on any paved surface during the ozone season in Kenosha, Kewaunee, Manitowoc, Milwaukee, Ozaukee, Racine, Sheboygan, Washington and Waukesha counties.

(2) **RESTRICTED MATERIALS.** During the ozone season, no person may cause, allow or permit the application of traffic marking material which exceeds the following limits:

(a) Except as provided in par. (b), for traffic marking material that is measurable as a liquid at the time of application, a VOC content of 91 grams per liter of coating or 0.76 pounds per gallon of coating, excluding water.

(b) For field-reacted traffic marking material, or for traffic marking material that is not measurable as a liquid at the time of application, a VOC emission rate of 3.6 kilograms per stripe-kilometer or 12.2 pounds per stripe-mile.

(3) **RECORDKEEPING.** (a) In addition to the applicable reporting and recordkeeping requirements of ss. NR 439.03 and 439.04, any person who applies traffic marking material and is subject to this section shall retain records sufficient to document the following:

1. Types and amounts of traffic marking materials purchased annually.

2. The VOC content or emission rate of each type of traffic marking material applied, either in grams per liter or pounds per gallon or kilograms per stripe-kilometer or pounds per stripe-mile.

3. Monthly quantities of each type of traffic marking material applied.

4. The counties in which each marking material was applied.

(b) The documentation required in par. (a) shall be kept for a period of 3 years after the traffic marking material is applied.

History: Cr. Register, July, 1994, No. 463, eff. 8-1-94.