

ORDER OF THE STATE OF WISCONSIN  
NATURAL RESOURCES BOARD  
RENUMBERING, AMENDING AND CREATING RULES

The Wisconsin Natural Resources Board proposes an order to renumber NR 484.03(1) to (4) and 484.11(7); to amend NR 422.125(4) (intro.), 484.04(9) and (24), 484.05(1) and 484.06(intro.); and to create NR 422.02(19s), NR 460 Appendix JJ, ch. NR 465, 484.03(1), 484.06(5) and 484.11(7) and (10), relating to volatile organic compound emissions and national emission standards for hazardous air pollutants for wood furniture manufacturing.

AM-37-00

**Commented [RWP1]:** Draft #10 as submitted 3/19/2001 with the adoption green sheet package. (We forgot to change "proposes" to "adopts" in the introductory clause box.)

Analysis Prepared by the Department of Natural Resources

Authorizing statutes: ss. 227.11(2)(a), 285.11(1) and 285.27(2), Stats.

Statutes interpreted: s. 285.27(2), Stats.

This proposed order will incorporate into state rules existing national emission standards for hazardous air pollutants (NESHAP) for wood furniture manufacturing operations. These standards took effect on December 7, 1995, and are intended to protect public health by requiring the control of emissions of hazardous air pollutants (HAP) to the level attainable by implementing the maximum achievable control technology. Sources affected are new and existing facilities which are involved in the manufacture of wood furniture or wood furniture components, and which have the potential to emit more than 10 tons per year of a single HAP or more than 25 tons per year of any combination of HAP. The standards include emission limitations for finishing materials and contact adhesives used by the wood furniture industry, as well as work practices for areas such as inspection and maintenance procedures, solvent cleaning and washoff operations and application equipment for finishing materials. Flexible compliance options are provided, including averaging and pollution prevention methods allowing sources to substitute non-toxic solvents for toxic ones. The standards include provisions exempting facilities based on low actual HAP emissions and low use of finishing materials, adhesives and solvents for cleaning and washoff.

In addition, this proposed order makes a change to existing volatile organic compound (VOC) control rules for this same industry. The change is proposed in order to make state VOC application equipment requirements consistent with, and no more restrictive than, the U.S. EPA guidance for this industry.

The consent of the Attorney General and the Revisor of Statutes will be requested for the incorporation by reference of a number of new test methods in ch. NR 484.

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SECTION 1. NR 422.02(19s) is created to read:

NR 422.02(19s) "Conventional air spray" means a spray coating method in which the coating is atomized by mixing it with compressed air and applied at an air pressure greater than 10 psig at the point of atomization.

Note: Airless and air assisted airless spray technologies are not conventional air spray because the coating is not atomized by mixing it with compressed air. Electrostatic spray technology is also not considered conventional air spray because an electrostatic charge is employed to attract the coating to the work piece.

SECTION 2. NR 422.125(4) (intro.) is amended to read:

NR 422.125(4) (intro.) After September 1, 1996, 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~~ may use conventional air spray to apply finishing materials only under any of the following conditions:

SECTION 3. NR 460 Appendix JJ, to precede Appendix KK, is created to read:

**Chapter NR 460**

**Appendix JJ**

**General Provisions Applicable to Chapter NR 465**

The general provisions of this chapter listed under the column heading "Reference" apply to sources subject to ch. NR 465 only if a Yes appears in the same row under the column heading "Applies to Chapter NR 465?". Certain provisions in other chapters which correspond to federal provisions in 40 CFR part 63 Subpart A are also included in the Reference column.

<b>Reference</b>	<b>Applies to Chapter NR 465?</b>	<b>Comment</b>
NR 2.19 and 2.195	Yes	
NR 406	Yes	
NR 407.04(1)(b)3.	Yes	
NR 460.02	Yes	Additional definitions in s. NR 465.02.
NR 460.03	Yes	Additional symbols in s. NR 465.03.
NR 460.04	Yes	
NR 460.05(1)	Yes	
NR 460.05(2)(a) to (c)	Yes	
NR 460.05(2)(d)	No	
NR 460.05(2)(e) and (f)	Yes	
NR 460.05(3)(a)	Yes	
NR 460.05(3)(b)	No	
NR 460.03(3)(c)	Yes	
NR 460.05(4)	Yes	Section NR 460.05(4)(c) applies only to affected sources using a control device to comply.
NR 460.05(5)	Yes	Affected sources complying through the procedures specified in s. NR 465.06(1)(a)1. and 2., (b), (c)1., (2)(a)1.

		and 2. and (2)(b) are subject to the emission standards at all times, including periods of startup, shutdown and malfunction
NR 460.05(6)	No	
NR 460.05(7)(a), (b) and (c)1.	Yes	
NR 460.05(7)(c)2.	No	
NR 460.05(7)(d) to (L)	Yes	
NR 460.06	Yes	Applies only to affected sources using a control device to comply.
NR 460.07	Yes	Applies only to affected sources using a control device to comply.
NR 460.08(1) to (5)	Yes	Section NR 460.08(5) applies only to affected sources using a control device to comply.
NR 460.08(6)	No	
NR 460.08(7) to (10)	Yes	Section NR 460.08(7) and (8)(b)2. apply only to affected sources using a control device to comply.
NR 460.09(1) to (3) and (4)(a) and (b)	Yes	Section NR 460.09(2)(b) and (4)(b) apply only to affected sources using a control device to comply.
NR 460.09(4)(c)	No	
NR 460.09(4)(d) and (e)	Yes	Section NR 460.09(4)(e) applies only to affected sources using a control device to comply.
NR 460.09(5)	Yes	Applies only to affected sources using a control device to comply.
NR 460.09(6)	Yes	
NR 460.10	No	
NR 484.04	Yes	

SECTION 4. Chapter NR 465 is created to read:

**CHAPTER 465**

**NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS**

**FOR WOOD FURNITURE MANUFACTURING OPERATIONS**

**NR 465.01 Applicability; purpose.** (1) APPLICABILITY. (a) This chapter applies to each facility that is engaged, either in part or in whole, in the manufacture of wood furniture or wood furniture components and that is located at a plant site that is a major source of hazardous air pollutants.

(b) An incidental wood furniture manufacturer shall maintain purchase or usage records demonstrating the source meets the criteria specified in s. NR 465.02(33), but the source is not subject to any other provisions of this chapter.

(c) A source that qualifies as an area source under this paragraph is not subject to any provisions of this chapter other than those in this paragraph. For subds. 1. and 2., finishing materials, adhesives, cleaning solvents and washoff solvents used for wood furniture or wood furniture component manufacturing operations shall account for at least 90% of annual HAP emissions at the plant site, and if the plant site has HAP emissions that do not originate from the

listed materials, the owner or operator shall keep any records necessary to demonstrate that the 90% criterion is being met. A source that initially relies on the limits and criteria specified in subd. 1., 2. or 3. to become an area source, but subsequently exceeds the relevant limit, without first obtaining and complying with other limits that keep its potential to emit hazardous air pollutants below major source levels, becomes a major source and shall comply thereafter with all applicable provisions of this chapter starting on the applicable compliance date in s. NR 465.055. Nothing in this paragraph is intended to preclude a source from limiting its potential to emit through other appropriate mechanisms. A source qualifies as an area source for the purposes of this chapter if the criteria in one of the following subdivisions are met:

1. The owner or operator of the source uses no more than a total of 250 gallons per month, for every month, of coating, adhesive, cleaning material and washoff materials at the source, including materials used for source categories other than wood furniture, but excluding materials used in routine janitorial or facility grounds maintenance, personal uses by employees or other persons, the use of products for the purpose of maintaining motor vehicles operated by the facility, the use of toxic chemicals contained in intake water used for processing or noncontact cooling and intake air used either as

compressed air or for combustion. The owner or operator shall maintain records for 5 years of the total gallons of coating, adhesive, cleaning material and washoff material used each month, and upon request submit the records to the department.

2. The owner or operator of the source uses no more than 3,000 gallons per rolling 12-month period, for every 12-month period, of coating, adhesive, cleaning material and washoff material at the source, including materials used for source categories other than wood furniture, but excluding materials used in routine janitorial or facility grounds maintenance, personal uses by employees or other persons, the use of products for the purpose of maintaining motor vehicles operated by the facility, the use of toxic chemicals contained in intake water used for processing or noncontact cooling and intake air used either as compressed air or for combustion. The owner or operator of the source shall maintain records of the total gallons of coating, adhesive, cleaning material and washoff material used each month and the total gallons used each previous month, and upon request submit the records to the department. The owner or operator shall keep monthly records beginning no less than one year before the compliance date specified in s. NR 465.055 and maintain the records for 5 years.

3. The source emits no more than 4.5 Mg (5 tons) of any one HAP per rolling 12-month period and no more than 11.4 Mg (12.5 tons) of any

combination of HAP per rolling 12-month period, and at least 90% of the plantwide HAP emissions per rolling 12-month period are associated with the manufacture of wood furniture or wood furniture components. The owner or operator shall maintain records for 5 years that demonstrate that annual emissions do not exceed these levels, including monthly usage records and certified product data sheets for all finishing material, adhesive, cleaning material and washoff material, and any other records necessary to document emissions from source categories other than wood furniture. The owner or operator shall submit the records to the department upon request.

(d) This chapter does not apply to research or laboratory equipment for which the primary purpose is to conduct research and development into new processes and products, where the equipment is operated under the close supervision of technically trained personnel and is not engaged in the manufacture of products for commercial sale in commerce, except in a de minimis manner.

(e) The owner or operator of an affected source shall comply with the requirements of ch. NR 460, according to the applicability of ch. NR 460 to the sources, as identified in ch. NR 460 Appendix JJ.

(f) Reconstructed affected sources are subject to the requirements for new affected sources. The costs associated with the purchase and installation of air pollution control equipment are not

considered in determining whether the facility has been reconstructed, unless the control equipment is part of the process. Additionally, the costs of retrofitting and replacement of equipment that is installed specifically to comply with this chapter are not considered reconstruction costs.

Note: An example of when control equipment is part of a process is where the equipment is used to recover product or raw material. An example of costs for equipment replacement which would not be considered reconstruction costs is the replacement of storage tanks, mix equipment and transfer lines to accommodate conversion to waterborne coatings where the purpose of the conversion is to comply with this chapter.

(2) PURPOSE. This chapter is adopted under ss. 285.27(2) and 285.65, Stats., to establish emission standards for hazardous air pollutants for wood furniture and wood furniture component manufacturing operations.

Note: This chapter is based on the federal regulations contained in 40 CFR part 63 Subpart JJ, created Dec. 7, 1995, as last revised on Dec. 28, 1998.

**NR 465.02 Definitions.** For terms not defined in this section, the definitions contained in chs. NR 400 and 460 apply to the terms used in this chapter, with definitions in ch. NR 460 taking priority over definitions in ch. NR 400. If this section defines a term which is also defined in ch. NR 400 or 460, the definition in this section applies in this chapter. In this chapter:

(1) "Adhesive" means any chemical substance that is applied for the purpose of bonding 2 surfaces together other than by mechanical means. Products used on humans and animals, adhesive tape, contact paper or any other product with an adhesive incorporated onto or in an inert substrate are not considered adhesives under this chapter.

(2) "Aerosol adhesive" means an adhesive that is dispensed from a pressurized container as a suspension of fine solid or liquid particles in gas.

(3) "Affected source" means a wood furniture manufacturing facility that is engaged, either in part or in whole, in the manufacture of wood furniture or wood furniture components and that is located at a plant site that is a major source of hazardous air pollutants.

(4) "Alternative method" means any method of sampling and analyzing for an air pollutant that is not a reference or equivalent method but has been demonstrated to the administrator's satisfaction to, in specific cases, produce results adequate for a determination of compliance.

(5) "As applied" means the HAP and solids content of the coating or contact adhesive that is actually used for coating or gluing the substrate. It includes the contribution of materials used for in-house dilution of the coating or contact adhesive.

(6) "Basecoat" means a coat of colored material, usually opaque, that is applied before graining inks, glazing coats or other opaque finishing materials, and is usually topcoated for protection.

(7) "Capture device" means a hood, enclosed room, floor sweep or other means of collecting solvent emissions or other pollutants into a duct so that the pollutant can be directed to a pollution control device such as an incinerator or carbon adsorber.

(8) "Capture efficiency" means the fraction of all organic vapors generated by a process that are directed to a control device.

(9) "Certified product data sheet" or "CPDS" means documentation furnished by coating or adhesive suppliers or an outside laboratory and measured in accord with s. NR 465.09(1) that provides all of the following:

(a) The VHAP content of a finishing material, contact adhesive or solvent, by percent by weight, for each VHAP present in concentrations greater than or equal to 1.0% by weight, or 0.1% for VHAP that are carcinogens as defined by the occupational safety and health administration hazard communication standard in 29 CFR part 1910 Subpart Z, incorporated by reference in s. NR 484.03(1).

(b) The solids content of a finishing material or contact adhesive by percent by weight.

(c) The density of the finishing material, adhesive or solvent.

Note: Because the optimum analytical conditions under Method 311, used pursuant to s. NR 465.09(1), vary by coating, the coating or adhesive supplier may also choose to include on the CPDS the optimum analytical conditions for analysis of the coating, adhesive or solvent using EPA Method 311. Information may include, but not be limited to, separation column, oven temperature, carrier gas, injection port temperature, extraction solvent and internal standard.

(10) "Cleaning operations" means operations in which organic HAP solvent is used to remove coating materials or adhesives from equipment used in wood furniture manufacturing operations.

(11) "Coating" means a protective, decorative or functional film applied in a thin layer to a surface. Coating materials include paints, topcoats, varnishes, sealers, stains, washcoats, basecoats, enamels, inks and temporary protective coatings. Adhesives and aerosol spray used for touch-up and repair are not considered coatings under this chapter.

(12) "Coating solids" or "solids" means the part of the coating which remains after the coating is dried or cured.

(13) "Contact adhesive" means an adhesive that is applied to 2 substrates, dried and then mated under only enough pressure to provide sufficient contact so that the resulting bond is immediate and sufficiently strong to hold pieces together without further clamping, pressure or airing.

(14) "Continuous coater" means a finishing system that

continuously applies finishing materials onto furniture parts moving along a conveyor. Examples of application methods that can be used with a continuous coater include spraying, curtain coating, roll coating, dip coating and flow coating.

(15) "Continuous compliance" means that the affected source is meeting the emission limitations and other requirements of the rule at all times and is fulfilling all monitoring and recordkeeping provisions of the rule in order to demonstrate compliance.

(16) "Control device" means any equipment that reduces the quantity of a pollutant that is emitted to the air.

Note: The device may destroy or secure the pollutant for subsequent recovery.

(17) "Control device efficiency" means the ratio of the amount of the pollutant reduced by a control device and the amount of the pollutant introduced to the control device.

(18) "Control system" means the combination of capture and control devices used to reduce emissions to the atmosphere.

(19) "Conventional air spray" means a spray coating method in which the coating is atomized by mixing it with compressed air and applied at an air pressure greater than 10 psig at the point of atomization.

Note: Airless and air assisted airless spray technologies are not conventional air spray because the coating is not atomized by mixing it with compressed air. Electrostatic

spray technology is also not considered conventional air spray because an electrostatic charge is employed to attract the coating to the workpiece.

(20) "Day" means a period of 24 consecutive hours beginning at midnight local time, or beginning at a time consistent with a facility's operating schedule.

(21) "Enamel" means a coat of colored material, usually opaque, that is applied as a protective topcoat over a basecoat, primer or previously applied enamel coats. In some cases, another finishing material may be applied as a topcoat over the enamel.

(22) "Existing", when used to modify affected source, area source or source, means construction or reconstruction which is commenced before December 6, 1994.

(23) "Finishing material" means a coating used in the wood furniture industry. "Finishing material" includes stains, basecoats, washcoats, enamels, sealers and topcoats.

(24) "Finishing operation" means those operations in which a finishing material is applied to a substrate and is subsequently air-dried, cured in an oven or cured by radiation.

(25) "Foam adhesive" means a contact adhesive used for gluing foam to fabric, foam to foam and fabric to wood.

(26) "Gluing operations" means those operations in which adhesives are used to join components, for example, to apply a laminate

to a wood substrate or foam to fabric.

(27) "Incidental wood furniture manufacturer" means a major source that is primarily engaged in the manufacture of products other than wood furniture or wood furniture components and that uses no more than 100 gallons per month of finishing material and no more than 100 gallons per month of adhesives in the manufacture of wood furniture or wood furniture components.

(28) "Material safety data sheet" or "MSDS" means the documentation required for hazardous chemicals by the occupational safety and health administration hazard communication standard in 29 CFR part 1910 Subpart Z, incorporated by reference in s. NR 484.03(1), for a solvent, cleaning material, contact adhesive, coating or other material that identifies select reportable hazardous ingredients of the material, safety and health considerations, and handling procedures.

(29) "New", when used to modify affected source, area source or source, means construction or reconstruction which is commenced on or after December 6, 1994.

(30) "Nonporous substrate" means a surface that is impermeable to liquids. Examples include metal, rigid plastic, flexible vinyl and rubber.

(31) "Operating parameter value" means a minimum or maximum value established for a control device or process parameter that, if achieved

by itself or in combination with one or more other operating parameter values, determines that an owner or operator has complied with an applicable emission limit.

(32) "Organic HAP solvent" means a HAP that is a volatile organic liquid used for dissolving or dispersing constituents in a coating or contact adhesive, adjusting the viscosity of a coating or contact adhesive, or cleaning equipment. When used in a coating or contact adhesive, the organic HAP solvent evaporates during drying and does not become a part of the dried film.

(33) "Overall control efficiency" means the efficiency of a control system, calculated as the product of the capture and control device efficiencies, expressed as a percentage.

(34) "Sealer" means a finishing material used to seal the pores of a wood substrate before additional coats of finishing material are applied. "Sealer" does not include special purpose finishing materials that are used in some finishing systems to optimize aesthetics.

(35) "Stain" means any color coat having a solids content by weight of no more than 8.0% that is applied in single or multiple coats directly to the substrate. "Stain" includes nongrain raising stains, equalizer stains, prestains, sap stains, body stains, no-wipe stains, penetrating stains and toners.

(36) "Storage containers" means vessels or tanks, including mix

equipment, used to hold finishing, gluing, cleaning or washoff materials.

(37) "Strippable spray booth coating" means a coating that meets all of the following:

(a) Is applied to a spray booth wall to provide a protective film to receive overspray during finishing operations.

(b) Is subsequently peeled off and disposed.

(c) Reduces or eliminates the need to use organic HAP solvents to clean spray booth walls.

(38) "Thinner" means a volatile liquid that is used to dilute coatings or contact adhesives to reduce viscosity, color strength and solids, or to modify drying conditions.

(39) "Topcoat" means the last film-building finishing material that is applied in a finishing system.

(40) "Touchup and repair" means the application of finishing materials to cover minor finishing imperfections.

(41) "VHAP" means any volatile hazardous air pollutant listed in Table 1.

(42) "VHAP of potential concern" means any VHAP from the list in Table 5.

(43) "Washcoat" means a transparent special purpose finishing material having a solids content by weight of 12.0% by weight or less.

Note: Washcoats are applied over initial stains to protect, to control color and to stiffen the wood fibers in order to aid sanding.

(44) "Washoff operations" means those operations in which organic HAP solvent is used to remove coating from wood furniture or a wood furniture component.

(45) "Wood furniture" means any product made of wood, a wood product such as rattan or wicker, or an engineered wood product such as particleboard that is manufactured under any of the following standard industrial classification codes, as described in the standard industrial classification manual, 1987, incorporated by reference in s. NR 484.05(1): 2434, 2511, 2512, 2517, 2519, 2521, 2531, 2541, 2599 or 5712.

(46) "Wood furniture component" means any part that is used in the manufacture of wood furniture. Examples include drawer sides, cabinet doors, seat cushions and laminated tops.

(47) "Wood furniture manufacturing operations" means the finishing, gluing, cleaning and washoff operations associated with the production of wood furniture or wood furniture components.

**NR 465.03 Symbols.** The symbols used in this chapter have the following meanings:

(1) "ac" means after the control system is installed and

operated.

(2) " $A_k$ " is the area of each natural draft opening  $k$  in a total enclosure, in square meters.

(3) "bc" means before control.

(4) " $C_{aj}$ " is the concentration of VHAP in gas stream  $j$  exiting the control device, in parts per million by volume.

(5) " $C_{bi}$ " is the concentration of VHAP in gas stream  $i$  entering the control device, in parts per million by volume.

(6) " $C_c$ " is the VHAP content of a finishing material  $c$  in kilograms of VHAP per kilogram of coating solids (kg VHAP/kg solids), as supplied. Also given in pounds of VHAP per pound of coating solids (lb VHAP/lb solids).

(7) " $C_{di}$ " is the concentration of VHAP in gas stream  $i$  entering the control device from the affected source, in parts per million by volume.

(8) " $C_{fk}$ " is the concentration of VHAP in uncontrolled gas stream  $k$  emitted directly to the atmosphere from the affected source, in parts per million by volume.

(9) "E" is the emission limit achieved by an emission point or a set of emission points, in kg VHAP/kg solids (lb VHAP/lb solids).

(10) "F" is the control device efficiency, expressed as a fraction.

(11) "FV" is the average inward face velocity across all natural draft openings in a total enclosure, in meters per hour.

(12) "G" is the VHAP content of a contact adhesive, in kg VHAP/kg solids (lb VHAP/lb solids), as applied.

(13) "M<sub>c</sub>" is the mass of solids in finishing material *c* used monthly, kg solids/month (lb solids/month).

(14) "N" is the capture efficiency, expressed as a fraction.

(15) "Q<sub>a<sub>j</sub></sub>" is the volumetric flow rate of gas stream *j* exiting the control device, in dry standard cubic meters per hour.

(16) "Q<sub>b<sub>i</sub></sub>" is the volumetric flow rate of gas stream *i* entering the control device, in dry standard cubic meters per hour.

(17) "Q<sub>d<sub>i</sub></sub>" is the volumetric flow rate of gas stream *i* entering the control device from the emission point, in dry standard cubic meters per hour.

(18) "Q<sub>f<sub>k</sub></sub>" is the volumetric flow rate of uncontrolled gas stream *k* emitted directly to the atmosphere from the emission point, in dry standard cubic meters per hour.

(19) "Q<sub>in i</sub>" is the volumetric flow rate of gas stream *i* entering the total enclosure through a forced makeup air duct, in standard cubic meters per hour, wet basis.

(20) "Q<sub>out j</sub>" is the volumetric flow rate of gas stream *j* exiting the total enclosure through an exhaust duct or hood, in standard cubic

meters per hour, wet basis.

(21) "R" is the overall efficiency of the control system, expressed as a percentage.

(22) "S" is the VHAP content of a solvent, expressed as a weight fraction, added to finishing materials.

(23) "W" is the amount of solvent, in kilograms (pounds), added to finishing materials during the monthly averaging period.

**NR 465.04 Emission limits.** (1) The owner or operator of an existing affected source shall do all of the following:

(a) Limit VHAP emissions from finishing operations to no more than the emission limitations for existing sources presented in Table 2, using any of the compliance methods in s. NR 465.06(1)(a). To determine VHAP emissions from a finishing material containing formaldehyde or styrene, the owner or operator of the affected source shall use the methods presented in s. NR 465.05(12)(a)2. for determining styrene and formaldehyde usage.

(b) Limit VHAP emissions from contact adhesives to no more than the following as appropriate:

1. 1.8 kg VHAP/kg solids (1.8 lb VHAP/lb solids), as applied, for foam adhesives used in products that meet the upholstered seating flammability requirements of California technical bulletin 116, 117 or

133, incorporated by reference in s. NR 484.06(5), the business and institutional furniture manufacturers association's BIFMA X5.7-1991, incorporated by reference in s. NR 484.11(7), upholstered furniture action council flammability test methods, incorporated by reference in s. NR 484.11(10), or any similar requirements from local, state or federal fire regulatory agencies.

2. 1.0 kg VHAP/kg solids (1.0 lb VHAP/lb solids), as applied, for all other contact adhesives, including foam adhesives used in products that do not meet the standards in subd. 1., but excluding aerosol adhesives and excluding contact adhesives applied to nonporous substrates.

(c) Limit HAP emissions from strippable spray booth coatings by using coatings that contain no more than 0.8 kg VOC/kg solids (0.8 lb VOC/lb solids), as applied.

(2) The owner or operator of a new affected source shall do all of the following:

(a) Limit VHAP emissions from finishing operations to no more than the emission limitations for new sources presented in Table 2 using any of the compliance methods in s. NR 465.06(2) (a). To determine VHAP emissions from a finishing material containing formaldehyde or styrene, the owner or operator of the affected source shall use the methods presented in s. NR 465.05(12) (a)2. for

determining styrene and formaldehyde usage.

(b) Limit VHAP emissions from contact adhesives, excluding aerosol adhesives and excluding contact adhesives applied to nonporous substrates, to no more than 0.2 kg VHAP/kg solids (0.2 lb VHAP/lb solids), as applied, using either of the compliance methods in s. NR 465.06(2) (b).

(c) Limit HAP emissions from strippable spray booth coatings by using coatings that contain no more than 0.8 kg VOC/kg solids (0.8 lb VOC/lb solids), as applied.

**NR 465.05 Work practice standards.** (1) WORK PRACTICE

IMPLEMENTATION PLAN. The owner or operator of an affected source shall prepare and maintain a written work practice implementation plan that defines environmentally desirable work practices for each wood furniture manufacturing operation and addresses each of the work practice standards in subs. (2) to (12). The plan shall be developed no more than 60 days after the applicable compliance date in s. NR 465.055. The written work practice implementation plan shall be available for inspection by the department upon request. If the department determines that the work practice implementation plan does not adequately address each of the topics specified in subs. (2) to (12), or that the plan does not include sufficient mechanisms for

ensuring that the work practice standards are being implemented, the department may require that the owner or operator of the affected source modify the plan. Revisions or modifications to the plan do not require a revision of a permit issued under ch. NR 407.

(2) OPERATOR TRAINING COURSE. The owner or operator of an affected source shall train all personnel, including contract personnel, who are involved in finishing, gluing, cleaning or washoff operations, use of manufacturing equipment or implementation of the requirements of this chapter. Personnel hired on or after the compliance date of the standard shall be trained upon hiring. Personnel hired before the compliance date shall be trained within 6 months of the compliance date of the standard. All personnel shall be given refresher training annually. The owner or operator of an affected source shall maintain a copy of the training program with the work practice implementation plan. The training program shall include, at a minimum, all of the following:

(a) A list of all current personnel by name and job description that are required to be trained.

(b) An outline of the subjects to be covered in the initial and refresher training for each position or group of personnel.

(c) Lesson plans for courses to be given at the initial and the annual refresher training that include, at a minimum, appropriate

application techniques, appropriate cleaning and washoff procedures, appropriate equipment setup and adjustment to minimize finishing material usage and overspray and appropriate management of cleanup wastes.

(d) A description of the methods to be used to demonstrate and document that personnel have successfully completed the initial and refresher training.

(3) INSPECTION AND MAINTENANCE PLAN. The owner or operator of an affected source shall prepare and maintain, with the work practice implementation plan, a written leak inspection and maintenance plan for all pumps, valves, flanges and other equipment used to transfer or apply coatings, adhesives or organic HAP solvents that specifies all of the following:

(a) An inspection schedule which specifies a minimum visual inspection frequency of once per month.

(b) Methods for documenting the date and results of each inspection and any repairs that were made.

(c) The timeframe between identifying the leak and making the repair, which adheres, at a minimum, to the following schedule:

1. A first attempt at repair shall be made no later than 5 calendar days after the leak is detected.

2. Final repairs shall be made within 15 calendar days after the

leak is detected, unless the leaking equipment is to be replaced by a new purchase, in which case repairs shall be completed within 3 months.

(4) CLEANING AND WASHOFF SOLVENT ACCOUNTING SYSTEM. The owner or operator of an affected source shall develop an organic HAP solvent accounting form to record all of the following:

(a) The quantity and type of organic HAP solvent used each month for washoff and cleaning operations.

(b) The number of pieces washed off, and the reason for the washoff.

(c) The quantity of spent organic HAP solvent generated from each washoff and cleaning operation each month, and whether it is reused onsite in a process other than cleaning or washoff or disposed of outside of the facility boundaries.

(5) CHEMICAL COMPOSITION OF CLEANING AND WASHOFF SOLVENTS. The owner or operator of an affected source may not use solvents for cleaning or washoff operations that contain any of the pollutants listed in Table 3 in concentrations that require inclusion on an MSDS in accordance with the occupational safety and health administration hazard communication standard in 29 CFR part 1910 Subpart Z, incorporated by reference in s. NR 484.03(1).

(6) SPRAY BOOTH CLEANING. The owner or operator of an affected source may not use compounds containing more than 8.0% by weight of VOC

for cleaning spray booth components other than conveyors, continuous coaters and their enclosures, or metal or plastic filters. If the spray booth coating or other protective material used to cover the booth is being replaced, the owner or operator may not use more than 1.0 gallon of organic HAP solvent per booth to prepare the surface of the booth prior to applying the booth coating.

(7) STORAGE REQUIREMENTS. The owner or operator of an affected source shall store finishing, gluing, cleaning and washoff materials in closed containers.

(8) APPLICATION EQUIPMENT REQUIREMENTS. The owner or operator of an affected source may use conventional air spray guns to apply finishing materials only under any of the following circumstances:

(a) To apply finishing materials that have a VOC content no greater than 1.0 kg VOC/kg solids (1.0 lb VOC/lb solids), as applied.

(b) For touchup and repair under any of the following conditions:

1. The touchup and repair occurs after completion of the finishing operation.

2. The touchup and repair occurs after the application of stain and before the application of any other type of finishing material, and the materials used for touchup and repair are applied from a container that has a volume of no more than 2.0 gallons.

(c) When the spray gun is aimed and triggered automatically.

(d) When emissions from the finishing application station are directed to a control device.

(e) When the cumulative total usage of finishing materials applied with conventional air spray guns is no more than 5.0% of the total gallons of finishing material used during that semiannual period.

(f) When the conventional air gun is used to apply stain on a part for which it is technically or economically infeasible to use any other spray application technology. The owner or operator of an affected source shall demonstrate technical or economic infeasibility by submitting to the department a videotape, a technical report or other documentation that supports the affected source's claim of technical or economic infeasibility. The owner or operator shall use one or both of the following criteria to support a claim that no other spray application technology is technically or economically feasible:

1. The production speed is too high or the part shape is too complex for one operator to coat the part and the application station is not large enough to accommodate an additional operator.

2. The excessively large vertical spray area of the part makes it difficult to avoid sagging or runs in the stain.

(9) LINE CLEANING. The owner or operator of an affected source shall pump or drain all organic HAP solvent used for line cleaning into a container which shall be kept covered except when actively adding

solvent to or removing solvent from the container.

(10) GUN CLEANING. The owner or operator of an affected source shall collect all organic HAP solvent used to clean spray guns into a container which shall be kept covered except when actively adding solvent to or removing solvent from the container.

(11) WASHOFF OPERATIONS. The owner or operator of an affected source shall control emissions from washoff operations by doing both of the following:

(a) Equipping any tank used for washoff operations with a cover and keeping the cover closed whenever the tank is not being used.

(b) Minimizing dripping by tilting or rotating the part to drain as much solvent as possible.

(12) FORMULATION ASSESSMENT PLAN FOR FINISHING OPERATIONS. (a) The owner or operator of an affected source shall prepare and maintain with the work practice implementation plan a formulation assessment plan that does all of the following:

1. Identifies VHAP from the list presented in Table 4 that are being used in finishing operations by the affected source.

2. Establishes a baseline level of usage by the affected source for each VHAP identified in subd. 1. The baseline usage level shall be the highest annual usage from 1994, 1995 or 1996, for each VHAP identified in subd. 1., or from another year approved by the department

if annual usage data for those years is not available or if the affected source was not in operation during those years. For formaldehyde, the baseline level of usage shall be based on the amount of free formaldehyde present in the finishing material when it is applied. For styrene, the baseline level of usage shall be an estimate of unreacted styrene, which shall be calculated by multiplying the amount of styrene monomer in the finishing material, when it is applied, by a factor of 0.16. For sources using a control device to reduce emissions, an adjusted usage may be calculated based on the overall control efficiency of the control system.

3. Tracks the annual usage of each VHAP identified in subd. 1. that is present in amounts that require inclusion on an MSDS in accordance with the occupational safety and health administration hazard communication standard in 29 CFR part 1910 Subpart Z, incorporated by reference in s. NR 484.03.(1).

(b) If, after November 1998, the annual usage of the VHAP identified under par. (a)1. exceeds the baseline level established under par. (a)2., the owner or operator of the affected source shall provide a written notification to the department that describes the amount of the increase and explains the reasons for exceedance of the baseline level. Any of the following explanations relieve the owner or operator from further action, unless the affected source is not in

compliance with any state regulations or requirements for that VHAP:

1. The exceedance is no more than 15.0% above the baseline level.

2. Usage of the VHAP is below the de minimis level presented in Table 4 for that VHAP. For sources using a control device to reduce emissions, an adjusted usage based on the overall control efficiency of the control system may be calculated and used to demonstrate that the source does not exceed the de minimis level in Table 4.

3. The affected source is in compliance with ch. NR 400 to 499 for the VHAP.

4. The source of the pollutant is a finishing material with a VOC content of no more than 1.0 kg VOC/kg solids (1.0 lb VOC/lb solids), as applied.

(c) If none of the explanations in par. (b) are the reason for the increase, the owner or operator shall confer with the department to discuss the reason for the increase and whether there are practical and reasonable technology-based solutions for reducing the usage. The evaluation of whether a technology is reasonable and practical shall be based on cost, quality and marketability of the product, whether the technology is being used successfully by other wood furniture manufacturing operations, or other criteria mutually agreed upon by the department and owner or operator. If there are no practical and reasonable solutions, the owner or operator need take no further

action. If there are solutions, the owner or operator shall develop a plan to reduce usage of the pollutant to the extent feasible. The plan shall address the approach to be used to reduce emissions, a timetable for implementing the plan and a schedule for submitting notification of progress.

(d) If, after November 1998, the owner or operator of an affected source uses a VHAP of potential concern listed in Table 5 for which a baseline level has not been previously established, the baseline level shall be established as the de minimis level provided in Table 5 for that chemical. The owner or operator shall track the annual usage of each VHAP of potential concern identified in this paragraph that is present in amounts that require inclusion on an MSDS in accordance with the occupational safety and health administration hazard communication standard in 29 CFR part 1910 Subpart Z, incorporated by reference in s. NR 484.03(1). If usage of the VHAP of potential concern exceeds the de minimis level listed in Table 5 for that chemical, the owner or operator shall provide an explanation to the department that documents the reason for exceedance of the de minimis level. If the explanation is not one of those listed in par. (b), the owner or operator shall follow the procedures in par. (c).

**NR 465.055 Compliance dates.** (1) EXISTING SOURCES. The

compliance date for existing affected sources that emit less than 50 tons per year of HAP in 1996 is December 7, 1998. The compliance date for existing affected sources that emit 50 tons or more of hazardous air pollutants in 1996 is November 21, 1997. The owner or operator of an existing area source that increases its emissions of, or its potential to emit, HAP such that the source becomes a major source that is subject to this chapter shall comply with this chapter one year after becoming a major source.

(2) NEW SOURCES. The compliance date for new affected sources is immediately upon startup or by December 7, 1995, whichever is later. The compliance date for new area sources that become major sources is immediately upon becoming a major source.

Note: Compliance dates are federally enforceable under 40 CFR 63.800 prior to the effective date of this section.

**NR 465.06 Compliance methods and procedures. (1) EXISTING**

SOURCES. (a) *Finishing materials*. The owner or operator of an existing affected source shall comply with s. NR 465.04(1)(a) by using any of the following methods:

1. Calculate the average VHAP content for all finishing materials used at the facility using Equation 1, and maintain a value of E no greater than 1.0.

$$E = (M_{c1}C_{c1} + M_{c2}C_{c2} + \dots + M_{cn}C_{cn} + S_1W_1 + S_2W_2 + \dots + S_nW_n) / (M_{c1} + M_{c2} + \dots + M_{cn})$$

(Equation 1)

2. Use compliant finishing materials according to the following criteria:

a. Demonstrate that each stain, sealer and topcoat has a VHAP content of no more than 1.0 kg VHAP/kg solids (1.0 lb VHAP/lb solids), as applied, and each thinner contains no more than 10.0% VHAP by weight by maintaining certified product data sheets for each coating and thinner.

b. Demonstrate that each washcoat, basecoat and enamel that is not formulated at the affected source by thinning another finishing material has a VHAP content of no more than 1.0 kg VHAP/kg solids (1.0 lb VHAP/lb solids), as applied, and each thinner contains no more than 10.0% VHAP by weight by maintaining certified product data sheets for each coating and thinner.

c. Demonstrate that each washcoat, basecoat and enamel that is formulated at the affected source is formulated using a finishing material containing no more than 1.0 kg VHAP/kg solids (1.0 lb VHAP/lb solids) and a thinner containing no more than 3.0% VHAP by weight.

3. Use a control system with an overall control efficiency (R)

such that the value of  $E_{ac}$  in Equation 2 is no greater than 1.0. The value of  $E_{bc}$  in Equation 2 shall be calculated using Equation 1 in subd. 1.

$$R = [(E_{bc} - E_{ac}) / E_{bc}](100) \quad (\text{Equation 2})$$

4. Use any combination of the methods in subds. 1. to 3.

(b) *Foam adhesives.* The owner or operator of an existing affected source shall comply with s. NR 465.04(1)(b)1. by using foam adhesives with a VHAP content no greater than 1.8 kg VHAP/kg solids (1.8 lb VHAP/lb solids), as applied.

(c) *Other contact adhesives.* The owner or operator of an existing affected source shall comply with s. NR 465.04(1)(b)2. by using either of the following methods:

1. Use contact adhesives with a VHAP content no greater than 1.0 kg VHAP/kg solids (1.0 lb VHAP/lb solids), as applied.

2. Use a control system with an overall control efficiency (R) such that the value of  $G_{ac}$  in Equation 3 is no greater than 1.0.

$$R = [(G_{bc} - G_{ac}) / G_{bc}](100) \quad (\text{Equation 3})$$

(2) NEW SOURCES. (a) *Finishing materials*. The owner or operator of a new affected source shall comply with s. NR 465.04(2) (a) by using any of the following methods:

1. Calculate the average VHAP content across all finishing materials used at the facility using Equation 1 in sub. (1)(a)1., and maintain a value of E no greater than 0.8.

2. Use compliant finishing materials according to the following criteria:

a. Demonstrate that each sealer and topcoat has a VHAP content of no more than 0.8 kg VHAP/kg solids (0.8 lb VHAP/lb solids), as applied, each stain has a VHAP content of no more than 1.0 kg VHAP/kg solids (1.0 lb VHAP/lb solids), as applied, and each thinner contains no more than 10.0% VHAP by weight by maintaining certified product data sheets for each coating and thinner.

b. Demonstrate that each washcoat, basecoat and enamel that is not formulated at the affected source by thinning another finishing material has a VHAP content of no more than 0.8 kg VHAP/kg solids (0.8 lb VHAP/lb solids), as applied, and each thinner contains no more than 10.0% VHAP by weight by maintaining certified product data sheets for each coating and thinner.

c. Demonstrate that each washcoat, basecoat and enamel that is formulated at the affected source is formulated using a finishing

material containing no more than 0.8 kg VHAP/kg solids (0.8 lb VHAP/lb solids) and a thinner containing no more than 3.0% VHAP by weight.

3. Use a control system with an overall control efficiency (R) such that the value of  $E_{ac}$  in Equation 4 is no greater than 0.8. The value of  $E_{bc}$  in Equation 4 shall be calculated using Equation 1 in sub. (1) (a)1.

$$R = [(E_{bc} - E_{ac}) / E_{bc}](100) \quad \text{(Equation 4)}$$

4. Use any combination of the methods in subds. 1. to 3.

(b) *Contact adhesives.* The owner or operator of a new affected source shall comply with s. NR 465.04(2) (b) by using either of the following methods:

1. Use contact adhesives with a VHAP content no greater than 0.2 kg VHAP/kg solids (0.2 lb VHAP/lb solids), as applied.

2. Use a control system with an overall control efficiency (R) such that the value of  $G_{ac}$  in Equation 3 in sub. (1) (c)2. is no greater than 0.2.

**NR 465.07 Initial compliance demonstration.** (1) FINISHING MATERIALS. The owner or operator of an affected source subject to the provisions of s. NR 465.04(1) (a) or (2) (a) shall demonstrate initial

compliance according to the following procedures as appropriate:

(a) If complying by using the methods in s. NR 465.06(1)(a)1. or (2)(a)1., submit the results of the averaging calculation using Equation 1 in s. NR 465.06(1)(a)1. for the first month with the initial compliance status report required by s. NR 465.11(2). The first month's calculation shall include data for the entire month in which the compliance date falls.

(b) If complying by using the methods s. NR 465.06(1)(a)2. or (2)(a)2., state in the initial compliance status report under s. NR 465.11(2) that compliant stains, washcoats, sealers, topcoats, basecoats, enamels and thinners, as applicable, are being used by the affected source.

(c) If complying by using the methods in s. NR 465.06(1)(a)2. or (2)(a)2. and applying coatings using continuous coaters, do one of the following:

1. State in the initial compliance status report under s. NR 465.11(2) that compliant coatings, as determined by the VHAP content of the coating in the reservoir and the VHAP content as calculated from records, and compliant thinners are being used.

2. State in the initial compliance status report under s. NR 465.11(2) that compliant coatings, as determined by the VHAP content of the coating in the reservoir, are being used; the viscosity of the

coating in the reservoir is being monitored; and compliant thinners are being used. The owner or operator shall also submit data that demonstrate that viscosity is an appropriate parameter for demonstrating compliance.

(d) If complying by using the methods in s. NR 465.06(1)(a)3. or (2)(a)3., do all of the following:

1. Submit a monitoring plan that identifies each operating parameter to be monitored for the capture device and discusses why each parameter is appropriate for demonstrating continuous compliance.

2. Conduct an initial performance test as required under s. NR 460.06 using the procedures and test methods listed in ss. NR 460.06 and 465.09(3) and (4).

3. Calculate the overall control efficiency (R) following the procedures in s. NR 465.09(4).

4. Determine those operating conditions critical to determining compliance and establish one or more operating parameters that will ensure compliance with the standard. Operating parameters shall include the following:

a. For a thermal incinerator, minimum combustion temperature shall be the operating parameter.

b. For a catalytic incinerator equipped with a fixed catalyst bed, the minimum gas temperature both upstream and downstream of the

catalyst bed shall be the operating parameters.

c. For a catalytic incinerator equipped with a fluidized catalyst bed, the minimum gas temperature upstream of the catalyst bed and the pressure drop across the catalyst bed shall be the operating parameters.

d. For a carbon adsorber, the total regeneration mass stream flow for each regeneration cycle and the carbon bed temperature after each regeneration, or the concentration level of organic compounds exiting the adsorber, shall be the operating parameters, unless the owner or operator requests and receives approval from the administrator to establish other operating parameters.

e. For a control device not listed in this subdivision, one or more operating parameter values shall be established as follows: The owner or operator shall submit, for the administrator's approval, a description of the device, test data verifying the performance of the device, and appropriate site-specific operating parameters that will be monitored to demonstrate continuous compliance with the standard.

(e) The value for each site-specific operating parameter in par. (d)4. shall be calculated as the arithmetic average of the maximum or minimum operating parameter values, as appropriate, that demonstrate compliance with the standards, during the 3 test runs required by s. NR 465.09(3) (a).

(2) CONTACT ADHESIVES. The owner or operator of an affected source subject to the provisions of s. NR 465.04(1)(b) or (2)(b) shall demonstrate initial compliance according to the following procedures as appropriate:

(a) If complying by using the methods in s. NR 465.06(1)(b), (c)1. or (2)(b)1., state in the initial compliance status report under s. NR 465.11(2) that compliant contact adhesives are being used by the affected source.

(b) If complying by using the methods in s. NR 465.06(1)(c)2. or (2)(b)2., do all of the following:

1. Submit a monitoring plan that identifies each operating parameter to be monitored for the capture device and discusses why each parameter is appropriate for demonstrating continuous compliance.

2. Conduct an initial performance test as required under s. NR 460.06 using the procedures and test methods listed in ss. NR 460.06 and 465.09(3) and (4).

3. Calculate the overall control efficiency (R) following the procedures in s. NR 465.09(4).

4. Determine those operating conditions critical to determining compliance and establish one or more operating parameters that will ensure compliance with the standard. Operating parameters shall include the following:

a. For a thermal incinerator, minimum combustion temperature shall be the operating parameter.

b. For a catalytic incinerator equipped with a fixed catalyst bed, the minimum gas temperature both upstream and downstream of the catalyst shall be the operating parameters.

c. For a catalytic incinerator equipped with a fluidized catalyst bed, the minimum gas temperature upstream of the catalyst bed and the pressure drop across the catalyst bed shall be the operating parameters.

(c) The value for each site-specific operating parameter in par.(b)4. shall be calculated as the arithmetic average of the maximum or minimum operating values, as appropriate, that demonstrate compliance with the standards, during the 3 test runs required by s. NR 465.09(3) (a).

(3) STRIPPABLE SPRAY BOOTH COATINGS. The owner or operator of an affected source subject to the provisions s. NR 465.04(1) (c) or (2) (c) shall demonstrate initial compliance by stating in the initial compliance status report under s. NR 465.11(2) that compliant strippable spray booth coatings are being used.

(4) WORK PRACTICE STANDARDS. The owner or operator of an affected source subject to the work practice standards in s. NR 465.05 shall demonstrate initial compliance by stating in the initial compliance

status report under s. NR 465.11(2) that the work practice implementation plan has been developed and procedures have been established for implementing the provisions of the plan.

**NR 465.08 Continuous compliance demonstration.** (1) FINISHING

MATERIALS. The owner or operator of an affected source subject to the provisions of s. NR 465.04(1)(a) or (2)(a) shall demonstrate continuous compliance according to the following procedures as appropriate:

(a) If complying by using the methods in s. NR 465.06(1)(a)1. or (2)(a)1., submit the results of the averaging calculation using Equation 1 in s. NR 465.06(1)(a)1. for each month within that semiannual period, and submit a compliance certification in accord with s. NR 465.11(3) which states that the value of E, as calculated using Equation 1 in s. NR 465.06(1)(a)1., is no greater than 1.0 for existing sources or 0.8 for new sources. An affected source is in violation of the standard if the value of E is greater than 1.0 for existing sources or 0.8 for new sources for any month. A violation of the monthly average is a separate violation of the standard for each day of operation during the month, unless the affected source can demonstrate through records that the violation of the monthly average can be attributed to a particular day or days during the period.

(b) If complying by using the methods in s. NR 465.06(1)(a)2. or

(2) (a) 2., except as provided for in par. (c), submit a compliance certification in accord with s. NR 465.11(3) which states that compliant stains, washcoats, sealers, topcoats, basecoats, enamels and thinners, as applicable, have been used each day in the semiannual reporting period or shall otherwise identify the periods of noncompliance and the reasons for noncompliance. An affected source is in violation of the standard whenever a noncompliant coating, as demonstrated by records or by a sample of the coating, is used.

(c) If complying by using the methods in s. NR 465.06(1) (a) 2. or (2) (a) 2. and applying coatings using continuous coaters, do one of the following:

1. Use compliant coatings, as determined by the VHAP content of the coating in the reservoir and the VHAP content as calculated from records, use compliant thinners and submit a compliance certification in accord with s. NR 465.11(3) which states that compliant coatings have been used each day in the semiannual reporting period, or shall otherwise identify the days of noncompliance and the reasons for noncompliance. An affected source is in violation of the standard whenever a noncompliant coating, as determined by records or by a sample of the coating, is used. Use of a noncompliant coating is a separate violation for each day the noncompliant coating is used.

2. Use compliant coatings, as determined by the VHAP content of

the coating in the reservoir, use compliant thinners, maintain a viscosity of the coating in the reservoir that is no less than the viscosity of the initial coating by monitoring the viscosity with a viscosity meter or by testing the viscosity of the initial coating and retesting the coating in the reservoir each time solvent is added, maintain records of solvent additions and submit a compliance certification with the semiannual report required by s. NR 465.11(3). The compliance certification shall be signed by a responsible official of the company that owns or operates the affected source and shall state that compliant coatings, as determined by the VHAP content of the coating in the reservoir, have been used each day in the semiannual reporting period. Additionally, the certification shall state that the viscosity of the coating in the reservoir has not been less than the viscosity of the initial coating, that is, the coating that is initially mixed and placed in the reservoir, for any day in the semiannual reporting period. An affected source is in violation of the standard when a sample of the as-applied coating exceeds the applicable limit established in s. NR 465.06(1)(a)2. or (2)(a)2., as determined using Method 311, in 40 CFR part 63, Appendix A, incorporated by reference in s. NR 438.04, or the viscosity of the coating in the reservoir is less than the viscosity of the initial coating.

(d) If complying by using the methods in s. NR 465.06(1)(a)3. or

(2) (a) 3., install, calibrate, maintain and operate equipment according to manufacturer's specifications to monitor each site-specific operating parameter established in accordance with s. NR 465.07(2) (b) 1.

The owner or operator shall also submit the excess emissions and continuous monitoring system performance report and summary report required by ss. NR 465.11(4) and 460.09(5). The appropriate monitoring equipment and related requirements include the following:

1. For an incinerator, a temperature monitoring device equipped with a continuous recorder shall be used as follows:

a. Where a thermal incinerator is used, the temperature monitoring device shall be installed in the firebox or in the ductwork immediately downstream of the firebox in a position before any substantial heat exchange occurs.

b. Where a catalytic incinerator equipped with a fixed catalyst bed is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.

c. Where a catalytic incinerator equipped with a fluidized catalyst bed is used, the temperature monitoring device shall be installed in the gas stream immediately before the bed. In addition, a pressure monitoring device shall be installed to determine the pressure drop across the catalyst bed. The pressure drop shall be measured monthly at a constant flow rate.

2. For a carbon adsorber, one of the following shall be used:

a. An integrating stream flow monitoring device, having an accuracy of  $\pm 10\%$ , capable of recording the total regeneration stream mass flow for each regeneration cycle; and a carbon bed temperature monitoring device, having an accuracy of  $\pm 1\%$  of the temperature being monitored or  $\pm 0.5$  °C, whichever is greater, and capable of recording the carbon bed temperature after each regeneration and within 15 minutes of completing any cooling cycle.

b. An organic compound monitoring device, equipped with a continuous recorder, to indicate the concentration level of organic compounds exiting the carbon adsorber.

c. Any other monitoring device that has been approved by the administrator in accordance with s. NR 465.07(1)(d)4.d.

3. The owner or operator of an affected source may not operate a capture or control device at a daily average value greater than or less than, as appropriate, the operating parameter values. The daily average value shall be calculated as the average of all values for a monitored parameter recorded during the operating day.

4. The owner or operator of an affected source that is complying through the use of a catalytic incinerator equipped with a fluidized catalyst bed shall maintain a constant pressure drop, measured monthly, across the catalyst bed.

5. An owner or operator using a control device not listed in s. NR 465.07(1)(d) shall submit, for the administrator's approval, a description of the device, test data verifying the performance of the device, and appropriate site-specific operating parameters that will be monitored to demonstrate continuous compliance with the standard.

(2) CONTACT ADHESIVES. The owner or operator of an affected source subject to the provisions of s. NR 465.04(1)(b) or (2)(b) shall demonstrate continuous compliance according to the following procedures as appropriate:

(a) If complying by using the methods in s. NR 465.06(1)(b), (c)1. or (2)(b)1., submit a compliance certification in accord with s. NR 465.11(3) which states that compliant contact adhesives, including foam adhesives, have been used each day in the semiannual reporting period, or should otherwise identify each day noncompliant contact or foam adhesives were used. Each day a noncompliant contact or foam adhesive is used is a single violation of the standard.

(b) If complying by using the methods in s. NR 465.06(1)(c)2. or (2)(b)2., install, calibrate, maintain and operate equipment according to the manufacturer's specifications to monitor each site-specific operating parameter established in accordance with s. NR 465.07(2)(b)1. The owner or operator shall also submit the excess emissions and continuous monitoring system performance report and summary report

required by ss. NR 465.11(4) and 460.09(5). The appropriate monitoring equipment and related requirements include the following:

1. For an incinerator, a temperature monitoring device equipped with a continuous recorder shall be used as follows:

a. Where a thermal incinerator is used, the temperature monitoring device shall be installed in the firebox or in the ductwork immediately downstream of the firebox in a position before any substantial heat exchange occurs.

b. Where a catalytic incinerator equipped with a fixed catalyst bed is used, temperature monitoring devices shall be installed in the gas stream immediately before and after the catalyst bed.

c. Where a catalytic incinerator equipped with a fluidized catalyst bed is used, the temperature monitoring device shall be installed in the gas stream immediately before the bed. In addition, a pressure monitoring device shall be installed to measure the pressure drop across the catalyst bed. The pressure drop shall be measured monthly at a constant flow rate.

2. For a carbon adsorber, one of the following shall be used:

a. An integrating stream flow monitoring device having an accuracy of  $\pm 10\%$ , capable of recording the total regeneration stream mass flow for each regeneration cycle; and a carbon bed temperature monitoring device, having an accuracy of  $\pm 1\%$  of the temperature being

monitored or  $\forall 0.5$  °C, whichever is greater, and capable of recording the carbon bed temperature after each regeneration and within 15 minutes of completing any cooling cycle.

b. An organic compound monitoring device, equipped with a continuous recorder, to indicate the concentration level of organic compounds exiting the carbon adsorber.

c. Any other monitoring device that has been approved by the administrator in accordance with s. NR 465.07(1)(d)4.d.

3. The owner or operator of an affected source may not operate a capture or control device at a daily average value greater than or less than, as appropriate, the operating parameter values. The daily average value shall be calculated as the average of all values for a monitored parameter recorded during the operating day.

4. The owner or operator of an affected source that is complying through the use of a catalytic incinerator equipped with a fluidized catalyst bed shall maintain a constant pressure drop, measured monthly, across the catalyst bed.

5. An owner or operator using a control device not listed in s. NR 465.07(1)(d) shall submit for the administrator's approval a description of the device, test data verifying the performance of the device, and appropriate site specific operating parameters that will be monitored to demonstrate continuous compliance with the standard.

(3) STRIPPABLE SPRAY BOOTH COATINGS. The owner or operator of an affected source subject to the provisions s. NR 465.04(1)(c) or (2)(c) shall demonstrate continuous compliance by submitting a compliance certification in accord with s. NR 465.11(3) which states that compliant strippable spray booth coatings have been used each day in the semiannual reporting period, or otherwise identifies each day noncompliant materials were used. Each day a noncompliant strippable booth coating is used is a single violation of the standard.

(4) WORK PRACTICE STANDARDS. The owner or operator of an affected source shall demonstrate continuous compliance with the work practice standards in s. NR 465.05 by submitting a compliance certification in accord with s. NR 465.11(3) which states that the work practice implementation plan is being followed, or otherwise identifies the provisions of the plan that have not been implemented and each day the provisions were not implemented. During any period of time that an owner or operator is required to implement the provisions of the plan, each failure to implement an obligation under the plan during any particular day is a violation.

**NR 465.09 Performance test methods.** (1)(a) Except as provided in par.(c), the owner or operator of an affected source shall use Method 311 in 40 CFR part 63, Appendix A, incorporated by reference in s. NR

484.04(25), in conjunction with formulation data, to determine the VHAP content of liquid coatings. Formulation data shall be used to identify VHAP present in the coating. Method 311 shall then be used to quantify those VHAP identified through formulation data. Method 311 may not be used to quantify HAP such as styrene and formaldehyde that are emitted during the cure.

(b) Except as provided in par.(c), the owner or operator of an affected source shall use Method 24 in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04(13), to determine the solids content by weight and the density of coatings.

(c) If it is demonstrated to the satisfaction of the administrator that a coating does not release VOC or HAP byproducts during the cure, batch formulation information shall be accepted for determining the VHAP or VOC content of the coating. The owner or operator of an affected source may request approval from the administrator to use an alternative method for determining the VHAP content of the coating. In the event of any inconsistency between Method 24 or Method 311 test data for a material and formulation data for the same material, the applicable test method shall govern unless, after consultation, the owner or operator can demonstrate to the satisfaction of the department that the formulation data are correct.

(2) An owner or operator demonstrating compliance in accordance

with s. NR 465.07(1)(d) or (2)(b) or 465.08(1)(d) or (2)(b), or complying with any of the other emission limits of s. NR 465.04 by operating a capture and control device, shall determine the overall control efficiency of the control system (R) as the product of the capture and control device efficiency, using the test methods in sub. (3) and the procedures in sub. (4).

(3) When an initial compliance demonstration is required by s. NR 465.07(1)(d) or (2)(b), the following test methods shall be used:

(a) Method 18 in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04(13), shall be used to determine the HAP concentration of gaseous air streams. The test shall consist of 3 separate runs, each lasting a minimum of 30 minutes.

(b) Method 1 or 1A in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04(13), shall be used for sample and velocity traverses.

(c) Method 2, 2A, 2C or 2D in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04(13), shall be used to measure velocity and volumetric flow rates.

(d) Method 3 in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04(13), shall be used to analyze the exhaust gases.

(e) Method 4 in 40 CFR part 60, Appendix A, incorporated by

reference in s. NR 484.04(13), shall be used to measure the moisture in the stack gas.

(f) Methods 2, 2A, 2C, 2D, 3 and 4 in 40 CFR part 60, Appendix A, incorporated by reference in s. NR 484.04(13), shall be performed, as applicable, at least twice during each test period.

(4) An owner or operator of an affected source demonstrating compliance in accordance with s. NR 465.07(1)(d) or (2)(b) shall perform a gaseous emission test using the following procedures:

(a) Construct the overall HAP emission reduction system so that all volumetric flow rates and total HAP emissions can be accurately determined by the applicable test methods specified in sub.(3).

(b) Determine capture efficiency from the affected emission points by capturing, venting and measuring all HAP emissions from the affected emission points. The owner or operator shall isolate affected emission points located in an area with other nonaffected gaseous emission sources from all other gaseous emission points and shall determine capture efficiency according to the following procedures as appropriate:

1. For temporary total enclosures, capture efficiency shall be determined according to Method 204, and as applicable, Methods 204A through 204F, in 40 CFR part 51, Appendix M, incorporated by reference in s. NR 484.04(9).

2. For permanent total enclosures built around the affected emissions points, and where the building that houses the process is used as the enclosure, capture efficiency shall be assumed to be 100% when the requirements for a permanent total enclosure in Method 204, in 40 CFR part 51, Appendix M, incorporated by reference in s. NR 484.04(9), are satisfied. Notwithstanding par. (e), when a permanent total enclosure is confirmed through Method 204, a value of one shall be used for N when determining R under sub. (5), (6), (7) or (8).

3. Use any alternative protocol and test method provided they meet either the requirements of the data quality objective (DQO) approach or the lower confidence level (LCL) approach in 40 CFR part 63, Subpart KK, Appendix A, incorporated by reference in s. NR 484.04(24).

4. Shut down all nonaffected HAP emission points and continue to exhaust fugitive emissions from the affected emission points through any building ventilation system and other room exhausts such as drying ovens. All exhaust air shall be vented through stacks suitable for testing.

5. Use another methodology approved by the administrator provided it complies with the criteria for acceptance under Method 301 in 40 CFR part 63, Appendix A, incorporated by reference in s. NR 484.04(25).

(c) Operate the control device with all affected emission points

that will subsequently be delivered to the control device connected and operating at maximum production rate.

(d) Determine the efficiency (F) of the control device using the following equation:

$$F = \frac{\sum_{i=1}^n Q_{bi} C_{bi} - \sum_{j=1}^p Q_{aj} C_{aj}}{\sum_{i=1}^n Q_{bi} C_{bi}} \quad (\text{Equation 5})$$

(e) Determine the efficiency (N) of the capture system using the following equation:

$$N = \frac{\sum_{i=1}^n Q_{di} C_{di}}{\sum_{i=1}^n Q_{di} C_{di} + \sum_{k=1}^p Q_{fk} C_{fk}} \quad (\text{Equation 6})$$

(5) For an owner or operator complying with s. NR 465.04(1) (a) in accordance with s. NR 465.06(1) (a)3., compliance is demonstrated if the product of (F x N) (100) yields a value (R) such that the value of E<sub>ac</sub> in Equation 2 in s. NR 465.06(1) (a)3. is no greater than 1.0.

(6) For an owner or operator complying s. NR 465.04(2) (a) in accordance with s. NR 465.06(2) (a)3., compliance is demonstrated if the

product of  $(F \times N)(100)$  yields a value (R) such that the value of  $E_{ac}$  in Equation 4 in s. NR 465.06(2)(a)3. is no greater than 0.8.

(7) For an owner or operator complying with s. NR 465.04(1)(b)2. in accordance with s. NR 465.06(1)(c)2., compliance is demonstrated if the product of  $(F \times N)(100)$  yields a value (R) such that the value of  $G_{ac}$  in Equation 3 in s. NR 465.06(1)(c)2. is no greater than 1.0.

(8) For an owner or operator complying with s. NR 465.04(2)(b) in accordance with s. NR 465.06(2)(b)2., compliance is demonstrated if the product of  $(F \times N)(100)$  yields a value (R) such that the value of  $G_{ac}$  in Equation 3 s. NR 465.06(1)(c)2. is no greater than 0.2.

**NR 465.10 Recordkeeping requirements.** (1) The owner or operator of an affected source shall fulfill all recordkeeping requirements of s. NR 460.09 according to the applicability criteria in s. NR 465.01(1)(e).

(2) The owner or operator of an affected source subject to the emission limits in s. NR 465.04 shall maintain records of the following as appropriate:

(a) A certified product data sheet for each finishing material, thinner, contact adhesive and strippable spray booth coating subject to the emission limits in s. NR 465.04.

(b) The VHAP content, in kg VHAP/kg solids (lb VHAP/lb solids),

as applied, of each finishing material and contact adhesive subject to the emission limits in s. NR 465.04.

(c) The VOC content, in kg VOC/kg solids (lb VOC/lb solids), as applied, of each strippable spray booth coating subject to the emission limits in s. NR 465.04(1)(c) or (2)(c).

(3) The owner or operator of an affected source following the compliance method in s. NR 465.06(1)(a)1. or (2)(a)1. shall maintain copies of the averaging calculation for each month following the compliance date, as well as the data on the quantity of coatings and thinners used that is necessary to support the calculation of E in Equation 1 in s. NR 465.06(1)(a)1.

(4) The owner or operator of an affected source following the compliance procedures of s. NR 465.07(1)(c)2. or 465.08(1)(c)2. shall maintain the records required by s. NR 465.10(2) as well as records of all of the following:

(a) Solvent and coating additions to the continuous coater reservoir.

(b) Viscosity measurements.

(c) Data demonstrating that viscosity is an appropriate parameter for demonstrating compliance.

(5) The owner or operator of an affected source subject to the work practice standards in s. NR 465.05 shall maintain onsite a work

practice implementation plan and all records associated with fulfilling the requirements of that plan, including, but not limited to, all of the following:

(a) Records demonstrating that the operator training program required by s. NR 465.05(2) is in place.

(b) Records collected in accordance with the inspection and maintenance plan required by s. NR 465.05(3).

(c) Records associated with the cleaning solvent accounting system required by s. NR 465.05(4).

(d) Records associated with the limitation on the use of conventional air spray guns showing total finishing material usage and the percentage of finishing materials applied with conventional air spray guns for each semiannual period as required by s. NR 465.05(8) (e).

(e) Records associated with the formulation assessment plan required by s. NR 465.05(12).

(f) Copies of documentation such as logs developed to demonstrate that the other provisions of the work practice implementation plan are followed.

(6) The owner or operator of an affected source following the compliance method of s. NR 465.07(1) (d) or 465.08(1) (d) shall maintain copies of the calculations demonstrating that the overall control

efficiency (R) of the control system results in the value of  $E_{ac}$  required by Equation 2 in s. NR 465.06(1) (a)3. or Equation 4 in s. NR 465.06(2) (a)3., records of the operating parameter values, and copies of the semiannual compliance reports required by s. NR 465.11(4).

(7) The owner or operator of an affected source following the compliance method of s. NR 465.07(2) (b) or 465.08(2) (b) shall maintain copies of the calculations demonstrating that the overall control efficiency (R) of the control system results in the applicable value of  $G_{ac}$  calculated using Equation 3 in s. NR 465.06(1) (c)2., records of the operating parameter values, and copies of the semiannual compliance reports required by s. NR 465.11(4).

(8) The owner or operator of an affected source subject to the emission limits in s. NR 465.04 and following the compliance provisions of s. NR 465.07(1) (a) to (c), (2) (a), (3) or (4) or 465.08(1) (a) to (c), (2) (a), (3) or (4) shall maintain records of the compliance certifications submitted in accordance with s. NR 465.11(3) for each semiannual period following the compliance date.

(9) The owner or operator of an affected source shall maintain records of all other information submitted with the compliance status report required by ss. NR 460.08(8) and 465.11(2) and the semiannual reports required by s. NR 465.11(3).

(10) The owner or operator of an affected source shall maintain

all records in accordance with the requirements of s. NR 460.09(2) (a).

**NR 465.11 Reporting requirements.** (1) The owner or operator of an affected source subject to this chapter shall fulfill all reporting requirements of ss. NR 460.06 to 460.09 according to the applicability criteria in s. NR 465.01(1) (e).

(2) The owner or operator of an affected source demonstrating compliance in accordance with s. NR 465.07(1) (a) to (c), (2) (a), (3) or (4) shall submit the compliance status report required by s. NR 460.08(8) no later than 60 days after the compliance date. The report shall include the information required by s. NR 465.07(1) (a) to (c), (2) (a), (3) or (4).

(3) The owner or operator of an affected source demonstrating compliance in accordance with s. NR 465.08(1) (a) to (c), (2) (a), (3) or (4) shall submit a report covering the previous 6 months of wood furniture manufacturing operations as follows:

(a) The first report shall be submitted no later than 30 calendar days after the end of the first 6-month period following the compliance date.

(b) Subsequent reports shall be submitted no later than 30 calendar days after the end of each 6-month period following the first report.

(c) The semiannual reports shall include the information required by s. NR 465.08(1)(a) to (c), (2)(a), (3) and (4), a compliance certification stating whether the affected source was in compliance or noncompliance, and, if the affected source was in noncompliance, the measures taken to bring the affected source into compliance. The compliance certification shall be signed by a responsible official of the company that owns or operates the affected source.

(4) The owner or operator of an affected source demonstrating compliance in accordance with s. NR 465.08(1)(d) or (2)(b) shall submit the excess emissions and continuous monitoring system performance report and summary report required by s. NR 460.09(5). The report shall include the monitored operating parameter values required by s. NR 465.08(1)(d) or (2)(b). If the source experiences excess emissions, the report shall be submitted quarterly for at least one year after the excess emissions occur and until a request to reduce reporting frequency is approved, as indicated in s. NR 460.09(5)(c)1.c. If no excess emissions occur, the report shall be submitted semiannually.

(5) The owner or operator of an affected source required to provide a written notification under s. NR 465.05(12)(b) shall include in the notification one or more statements that explains the reasons for the usage increase. The notification shall be submitted no later than 30 calendar days after the end of the annual period in which the

usage increase occurred.

**Table 1**  
**List of Volatile Hazardous Air Pollutants**

<b>Chemical Name</b>	<b>CAS Number</b>
Acetaldehyde	75070
Acetamide	60355
Acetonitrile	75058
Acetophenone	98862
2-Acetylaminofluorine	53963
Acrolein	107028
Acrylamide	79061
Acrylic acid	79107
Acrylonitrile	107131
Allyl chloride	107051
4-Aminobiphenyl	92671
Aniline	62533
o-Anisidine	90040
Benzene	71432
Benzidine	92875
Benzotrichloride	98077
Benzyl chloride	100447
Biphenyl	92524

Bis(2-ethylhexyl) phthalate (DEHP)	117817
Bis(chloromethyl) ether	542881
Bromoform	75252
1,3-Butadiene	106990
Carbon disulfide	75150
Carbon tetrachloride	56235
Carbonyl sulfide	463581
Catechol	120809
Chloroacetic acid	79118
2-Chloroacetophenone	532274
Chlorobenzene	108907
Chloroform	67663
Chloromethyl methyl ether	107302
Chloroprene	126998
Cresols (isomers and mixture)	1319773
o-Cresol	95487
m-Cresol	108394
p-Cresol	106445
Cumene	98828
2,4-D (2,4-Dichlorophenoxyacetic acid, including salts and esters)	94757
DDE (1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene)	72559
Diazomethane	334883
Dibenzofuran	132649

1,2-Dibromo-3-chloropropane	96128
Dibutylphthalate	84742
1,4-Dichlorobenzene	106467
3,3'-Dichlorobenzidine	91941
Dichloroethyl ether	
(Bis(2-chloroethyl) ether)	111444
1,3-Dichloropropene	542756
Diethanolamine	111422
N,N-Dimethylaniline	121697
Diethyl sulfate	64675
3,3'-Dimethoxybenzidine	119904
4-Dimethylaminoazobenzene	60117
3,3'-Dimethylbenzidine	119937
Dimethylcarbamoyl chloride	79447
N,N-Dimethylformamide	68122
1,1-Dimethylhydrazine	57147
Dimethyl phthalate	131113
Dimethyl sulfate	77781
4,6-Dinitro-o-cresol, and salts	534521
2,4-Dinitrophenol	51285
2,4-Dinitrotoluene	121142
1,4-Dioxane (1,4-Diethyleneoxide)	123911
1,2-Diphenylhydrazine	122667
Epichlorohydrin	
(1-Chloro-2,3-epoxypropane)	106898

1,2-Epoxybutane	106887
Ethyl acrylate	140885
Ethylbenzene	100414
Ethyl carbamate (Urethane)	51796
Ethyl chloride (Chloroethane)	75003
Ethylene dibromide (Dibromoethane)	106934
Ethylene dichloride (1,2-Dichloroethane)	107062
Ethylene glycol	107211
Ethylene oxide	75218
Ethylenethiourea	96457
Ethylidene dichloride (1,1-Dichloroethane)	75343
Formaldehyde	50000
Glycol ethers <sup>a</sup>	
Hexachlorobenzene	118741
Hexachloro-1,3-butadiene	87683
Hexachloroethane	67721
Hexamethylene-1,6-diisocyanate	822060
Hexamethylphosphoramide	680319
Hexane	110543
Hydrazine	302012
Hydroquinone	123319
Isophorone	78591
Maleic anhydride	108316
Methanol	67561
Methyl bromide (Bromomethane)	74839

Methyl chloride (Chloromethane)	74873
Methyl chloroform (1,1,1-Trichloroethane)	71556
Methyl ethyl ketone (2-Butanone)	78933
Methylhydrazine	60344
Methyl iodide (Iodomethane)	74884
Methyl isobutyl ketone (Hexone)	108101
Methyl isocyanate	624839
Methyl methacrylate	80626
Methyl tert-butyl ether	1634044
4,4'-Methylene bis(2-chloroaniline)	101144
Methylene chloride (Dichloromethane)	75092
4,4'-Methylenediphenyl diisocyanate (MDI)	101688
4,4'-Methylenedianiline	101779
Naphthalene	91203
Nitrobenzene	98953
4-Nitrobiphenyl	92933
4-Nitrophenol	100027
2-Nitropropane	79469
N-Nitroso-N-methylurea	684935
N-Nitrosodimethylamine	62759
N-Nitrosomorpholine	59892
Phenol	108952
p-Phenylenediamine	106503
Phosgene	75445
Phthalic anhydride	85449

Polychlorinated biphenyls (Aroclors)	1336363
Polycyclic Organic Matter <sup>b</sup>	
1,3-Propane sultone	1120714
β-Propiolactone	57578
Propionaldehyde	123386
Propoxur (Baygon)	114261
Propylene dichloride (1,2-Dichloropropane)	78875
Propylene oxide	75569
1,2-Propylenimine (2-Methyl aziridine)	75558
Quinone	106514
Styrene	100425
Styrene oxide	96093
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016
1,1,2,2-Tetrachloroethane	79345
Tetrachloroethylene (Perchloroethylene)	127184
Toluene	108883
2,4-Toluediamine	95807
Toluene-2,4-diisocyanate	584849
o-Toluidine	95534
1,2,4-Trichlorobenzene	120821
1,1,2-Trichloroethane	79005
Trichloroethylene	79016
2,4,5-Trichlorophenol	95954
2,4,6-Trichlorophenol	88062
Triethylamine	121448

Trifluralin	1582098
2,2,4-Trimethylpentane	540841
Vinyl acetate	108054
Vinyl bromide	593602
Vinyl chloride	75014
Vinylidene chloride (1,1-Dichloroethylene)	75354
Xylenes (isomers and mixture)	1330207
o-Xylene	95476
m-Xylene	108383
p-Xylene	106423

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<sup>a</sup>Includes mono- and di-ethers of ethylene glycol, diethylene glycols and triethylene glycol; R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OR' where:

n = 1, 2 or 3

R = alkyl or aryl groups

R' = R, H, or groups which, when removed, yield glycol ethers with the structure: R-(OCH<sub>2</sub>CH<sub>2</sub>)<sub>n</sub>-OH. Polymers are excluded from the glycol category.

<sup>b</sup>Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 °C.

Table 2

Summary of Emission Limits and Compliance Demonstration Methods

Emission Point	Existing Source	New Source
(1) Finishing Operations:		
(a) Achieve a monthly weighted average VHAP content across all finishing materials (maximum kg VHAP/kg solids [lb VHAP/lb solids], as applied).	1.0	0.8
(b) Use compliant finishing materials (maximum kg VHAP/kg solids [lb VHAP/lb solids], as applied):		
1. Stains	<sup>a</sup> 1.0	<sup>a</sup> 1.0
2. Sealers	<sup>a</sup> 1.0	<sup>a</sup> 0.8
3. Topcoats	<sup>a</sup> 1.0	<sup>a</sup> 0.8
4. Washcoats	<sup>b</sup> 1.0	<sup>b</sup> 0.8
5. Basecoats	<sup>b</sup> 1.0	<sup>b</sup> 0.8
6. Enamels	<sup>b</sup> 1.0	<sup>b</sup> 0.8
(c) Use a control device.	<sup>c</sup> 1.0	<sup>c</sup> 0.8
(d) Use any combination of (a), (b) and (c).	1.0	0.8
(2) Cleaning Operation. Use compliant strippable spray booth coatings (maximum kg VOC/kg solids [lb VOC/lb solids], as applied)	0.8	0.8

(3) Contact Adhesives:

(a) Use compliant contact adhesives (maximum kg

VHAP/kg solids [lb VHAP/lb solids], as applied):

1. For aerosol adhesive, and for contact adhesives applied to nonporous substrates.	<sup>d</sup> NA	<sup>d</sup> NA
2. For foam adhesives used in products that meet flammability requirements.	1.8	0.2
3. For all other contact adhesives.	1.0	0.2

(b) Use a control device <sup>e</sup>1.0 <sup>e</sup>0.2

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<sup>a</sup> Any thinner used onsite shall contain no more than 10.0% VHAP by weight.

<sup>b</sup> Any thinner used onsite shall contain no more than 10.0% VHAP by weight if the finishing material is purchased premade, that is, if it is not formulated onsite by thinning other finishing materials, i.e., thinning a sealer to use as a washcoat. If formulated onsite, these shall be formulated using compliant finishing materials, i.e., those that meet the limits specified in this table, and thinners containing no more than 3.0% VHAP by weight.

<sup>c</sup> The control device shall be operated at an efficiency that is equivalent to no greater than 1.0 pound (or 0.8 pounds) of VHAP being emitted from the affected emission source per pound of solids used.

<sup>d</sup> There is no limit on the VHAP content of these adhesives.

<sup>e</sup> The control device shall be operated at an efficiency that is equivalent to no

greater than 1.0 pounds (or 0.2 pounds) of VHAP being emitted from the affected emission source per pound of solids used.

**Table 3**

**Pollutants Excluded From Use in Cleaning and Washoff Solvents**

<b>Chemical Name</b>	<b>CAS Number</b>
Acetaldehyde	75070
Acetamide	60355
2-Acetylaminoflourine	53963
Acrylamide	79061
Acrylonitrile	107131
4-Aminobiphenyl	92671
Aniline	62533
o-Anisidine	90040
Antimony trioxide	1309644
Arsenic and inorganic arsenic compounds	7440382
Benz(c)acridine	225514
Benzene	71432
Benzidine	92875
Benzo(a)anthracene	56553
Benzo(b)fluoranthene	205992
Benzo(a)pyrene	50328
Beryllium compounds	7440417
Beryllium salts	
Bis(chloromethyl)ether	542881

Bis(2-ethylhexyl)phthalate (DEHP)	117817
Bromoform	75252
1,3-Butadiene	106990
Cadmium compounds	
Captan	133062
Carbon tetrachloride	56235
Chlordane	57749
Chlorobenzilate	510156
Chloroform	67663
Chromium compounds (hexavalent)	
Chrysene	218019
Coke oven emissions	
DDE (1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene)	72559
Dibenz(ah)anthracene	53703
1,2:7,8-Dibenzopyrene	189559
1,2-Dibromo-3-chloropropane	96128
1,4-Dichlorobenzene (p)	106467
3,3'-Dichlorobenzidine	53963
Dichloroethyl ether (Bis(2-chloroethyl) ether)	111444
1,3-Dichloropropene	542756
Dichlorvos	62737
Diethyl sulfate	64675
3,3'-Dimethoxybenzidine	119904
Dimethyl aminoazobenzene	60117

7,12-Dimethylbenz (a)anthracene	57976
3,3'-Dimethyl benzidine	119937
Dimethyl carbamoyl chloride	79447
Dimethyl formamide	68122
1,1-Dimethyl hydrazine	57147
2,4-Dinitrotoluene	121142
1,4-Dioxane (1,4-Diethyleneoxide)	123911
1,2-Diphenylhydrazine	122667
Epichlorohydrin	106898
Ethyl acrylate	140885
Ethyl carbamate (Urethane)	51796
Ethylene dibromide (1,2-Dibromoethane)	106934
Ethylene dichloride (1,2-Dichloroethane)	107062
Ethylene oxide	75218
Ethylene thiourea	96457
Formaldehyde	50000
Heptachlor	76448
Hexachlorobenzene	118741
Hexamethylphosphoramide	680319
Hydrazine	302012
Indeno(1,2,3-cd)pyrene	193395
Lindane (Hexachlorocyclohexane, gamma)	58899
Methyl hydrazine	60344
Methylene chloride (Dichloromethane)	75092
4,4'-Methylenedianiline	101779

Nickel refinery dust	
Nickel subsulfide	12035722
2-Nitropropane	79469
N-Nitrosodimethylamine	62759
N-Nitroso-N-methylurea	684935
N-Nitrosomorpholine	59892
Pentachlorophenol	87865
Polychlorinated biphenyls (Aroclors)	1336363
1,3-Propane sultone	1120714
Propoxur	114261
Propylene dichloride (1,2-Dichloropropane)	78875
Propylene oxide	75569
1,2-Propylenimine (2-Methyl aziridine)	75558
Selenium sulfide (mono- and di-)	7488564
Styrene oxide	96093
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016
2,4-Toluene diamine	95807
o-Toluidine	95534
Toxaphene (Chlorinated camphene)	8001352
2,4,6-Trichlorophenol	88062
Vinyl bromide (Bromoethene)	593602
Vinyl chloride	75014

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Table 4

List of VHAP of Potential Concern Identified by Industry

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Chemical Name	CAS Number	de minimis (tons/yr)
Diethanolamine	111422	5.0
Dimethyl formamide	68122	1.0
2-Ethoxyethyl acetate	111159	10.0
Formaldehyde	50000	0.2
Isophorone	78591	0.7
2-Methoxyethanol	109864	10.0
Methylene chloride	75092	4.0
2-Nitropropane	79469	1.0
Phenol	108952	0.1
Styrene monomer	100425	1.0

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**Table 5**  
**VHAP of Potential Concern**

Chemical Name	CAS Number	de minimis (tons/yr)*
Acetaldehyde	75070	0.9
Acetamide	60355	1.0
Acetophenone	98862	1.0
2-Acetylaminoflourine	53963	0.0005
Acrolein	107028	0.04
Acrylamide	79061	0.002
Acrylonitrile	107131	0.03
Allyl chloride	107051	1.0
4-Aminobipheny	192671	1.0
Aniline	62533	0.1
o-Anisidine	90040	1.0
Benz (c) acridine	225514	0.01
Benzene	71432	0.2
Benzidine	92875	0.00003
Benzo (a) anthracene	56553	0.01
Benzo (b) fluoranthene	205992	0.01
Benzo (a) pyrene	50328	0.001

Benzotrichloride	98077	0.0006
Benzyl chloride	100447	0.04
Bis(chloromethyl) ether	542881	0.00003
Bis(2-ethylhexyl) phthalate (DEHP)	117817	0.5
Bromoform	75252	2.0
1,3-Butadiene	106990	0.007
Captan	133062	2.0
Carbon disulfide	75150	1.0
Carbon tetrachloride	56235	0.1
Carbonyl sulfide	463581	5.0
Catechol	120809	5.0
Chloramben	133904	1.0
Chlordane	57749	0.005
Chloroacetic acid	79118	0.1
2-Chloroacetophenone	532274	0.06
Chlorobenzilate	510156	0.04
Chloroform	67663	0.09
Chloromethyl methyl ether	107302	0.1
Chloroprene	126998	1.0
Chrysene	218019	0.01
Cobalt carbonyl	10210681	0.1
m-Cresol	108394	1.0
o-Cresol	95487	1.0
p-Cresol	106445	1.0
Cresols/Cresylic acid (isomers and mixture)	1319773	1.0

DDE (1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene	72559	0.01
Diazomethane	334883	1.0
Dibenz(ah)anthracene	53703	0.01
Dibenzofurans	132649	5.0
1,2:7,8-Dibenzopyrene	189559	0.01
1,2-Dibromo-3-chloropropane	96128	0.001
1,4-Dichlorobenzene (p)	106467	0.3
3,3'-Dichlorobenzidine	91941	0.02
Dichloroethyl ether (Bis(2-chloroethyl)ether)	111444	0.006
1,3-Dichloropropene	542756	1.0
Dichlorvos	62737	0.02
Diethanolamine	111422	5.0
Diethyl sulfate	64675	1.0
3,3'-Dimethoxybenzidine	119904	0.01
Dimethyl aminoazobenzene	60117	1.0
N,N-Dimethylaniline	121697	1.0
7,12-Dimethylbenz(a)anthracene	57976	0.01
3,3'-Dimethyl benzidine	119937	0.001
Dimethyl carbamoyl chloride	79447	0.002
Dimethyl formamide	68122	1.0
1,1-Dimethyl hydrazine	57147	0.0008
Dimethyl sulfate	77781	0.1
4,6-Dinitro-o-cresol, and salts	534521	0.1

2,4-Dinitrophenol	51285	1.0
2,4-Dinitrotoluene	121142	0.002
1,4-Dioxane (1,4-Diethyleneoxide)	123911	0.6
1,2-Diphenylhydrazine	122667	0.009
Epichlorohydrin	106898	2.0
1,2-Epoxybutane	106887	1.0
Ethyl acrylate	140885	0.1
Ethyl carbamate (Urethane)	51796	0.08
Ethylene dibromide (1,2-Dibromoethane)	106934	0.01
Ethylene dichloride (1,2-Dichloroethane)	107062	0.08
Ethylene imine	151564	0.0003
Ethylene oxide	75218	0.09
Ethylene thiourea	96457	0.06
Ethylidene dichloride (1,1-Dichloroethane)	75343	1.0
Fluomine	62207765	0.1
Formaldehyde	50000	0.2
Glycol ethers <sup>a</sup>		5.0
Heptachlor	76448	0.002
Hexachlorobenzene	118741	0.004
Hexachlorobutadiene	87683	0.09
Hexachlorocyclopentadiene	77474	0.1
Hexachloroethane	67721	0.5
Hexamethylene-1,6-diisocyanate	822060	5.0
Hexamethylphosphoramide	680319	0.01
Hydroquinone	123319	1.0

Indeno(1,2,3-cd)pyrene	193395	0.01
Isophorone	78591	0.07
Lindane (Hexachlorocyclohexane, gamma)	58899	0.005
Maleic anhydride	108316	1.0
Mercury, (acetato-o)phenyl- (Phenylmercuric Acetate)	62384	0.01
2-Methoxy ethanol	109864	10.0
Methyl bromide (Bromomethane)	74839	10.0
Methyl chloride (Chloromethane)	74873	1.0
Methylcyclopentadienyl manganese	12108133	0.1
4,4'-Methylene bis(2-chloroaniline)	101144	0.02
Methylene chloride (Dichloromethane)	75092	4.0
4,4'-Methylenedianiline	101779	1.0
Methylene diphenyl diisocyanate	101688	0.1
Methyl hydrazine	60344	0.006
Methyl iodide (Iodomethane)	74884	1.0
Methyl isocyanate	624839	0.1
Nickel carbonyl	13463393	0.1
Nitrobenzene	98953	1.0
4-Nitrobiphenyl	92933	1.0
4-Nitrophenol	100027	5.0
2-Nitropropane	79469	1.0
N-Nitrosodimethylamine	62759	0.0001
N-Nitroso-N-methylurea	684935	0.00002
N-Nitrosomorpholine	59892	1.0

Parathion	56382	0.1
Pentachloronitrobenzene (Quintobenzene)	82688	0.03
Pentachlorophenol	87865	0.07
Phenol	108952	0.1
Phthalic anhydride	85449	5.0
Polychlorinated biphenyls (Aroclors)	1336363	0.0009
Polycyclic organic matter <sup>b</sup>		0.01
1,3-Propane sultone	1120714	0.003
β-Propiolactone	57578	0.1
Propionaldehyde	123386	5.0
Propoxur	114261	2.0
Propylene dichloride (1,2-Dichloropropane)	78875	0.1
Propylene oxide	75569	0.5
1,2-Propylenimine (2-Methy aziridine)	75558	10.0003
Quinoline	91225	0.0006
Quinone	106514	5.0
Styrene	100425	1.0
Styrene oxide	96093	1.0
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746016	0.00000006
1,1,2,2-Tetrachloroethane	79345	0.03
Tetrachloroethylene (Perchloroethylene)	127184	4.0
Tetraethyl lead	78002	0.01
Tetramethyl lead	75741	0.01
2,4-Toluene diamine	95807	0.002
2,4-Toluene diisocyanate	584849	0.1

o-Toluidine	95534	0.4
Toxaphene (Chlorinated camphene)	8001352	0.006
1,1,2-Trichloroethane	79005	0.1
Trichloroethylene	79016	1.0
2,4,5-Trichlorophenol	95954	1.0
2,4,6-Trichlorophenol	88062	0.6
Trifluralin	1582098	0.9
2,2,4-Trimethylpentane	540841	5.0
Vinyl acetate	108054	1.0
Vinyl bromide (Bromoethene)	593602	0.06
Vinyl chloride	75014	0.02
Vinylidene chloride (1,1-Dichloroethylene)	75354	0.04

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\* These values are based on the de minimis levels provided in the proposed rulemaking, as published in the Federal Register on March 14, 1995 (60 FR 13664), pursuant to section 112(g) of the act using a 70-year lifetime exposure duration for all VHAP. Default assumptions and the de minimis values based on inhalation reference doses (RfC) are not changed by this adjustment.

<sup>a</sup> Except for ethylene glycol butyl ether, ethylene glycol ethyl ether (2-ethoxy ethanol), ethylene glycol hexyl ether, ethylene glycol methyl ether (2-ethoxyethanol), ethylene glycol phenyl ether, ethylene glycol propyl ether, ethylene glycol mono-2-ethylhexyl ether, diethylene glycol butyl ether, diethylene glycol ethyl ether, diethylene glycol methyl ether, diethylene glycol hexyl ether, diethylene glycol phenyl ether, diethylene glycol propyl ether, triethylene glycol butyl ether, triethylene glycol ethyl ether, triethylene glycol methyl ether, triethylene glycol propyl ether, ethylene glycol butyl

ether acetate, ethylene glycol ethyl ether acetate, and diethylene glycol ethyl ether acetate.

<sup>b</sup> Except for benzo(b)fluoranthene, benzo(a)anthracene, benzo(a)pyrene, 7,12-dimethylbenz(a)anthracene, benz(c)acridine, chrysene, dibenz(ah)anthracene, 1,2:7,8-dibenzopyrene, indeno(1,2,3-cd)pyrene, but including dioxins and furans.

SECTION 5. NR 484.03(1) to (4) are renumbered 484.03(2) to (5).

SECTION 6. NR 484.03(1) is created to read:

NR 484.03

(1) 29 CFR part 1910 Toxic and Hazardous Substances NR 465  
subpart Z

SECTION 7. NR 484.04(9) and (24) are amended to read:

NR 484.04

(9) 40 CFR part 51 Appendix M	Recommended Test Methods for State Implementation Plans	NR 439 <u>NR 465.09(4) (b)1.</u> <u>and 2.</u> NR 466.09(5)
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(24) 40 CFR part 63, Subpart KK, Appendix A	Data Quality Objective and Lower Confidence Limit Approaches for Alternative Capture Efficiency Protocols and Test Methods	NR 439.06(3) (am) <u>NR 465.09(4) (b)3.</u> NR 466.09(6)
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SECTION 8. NR 484.05(1) is amended to read:

NR 484.05

(1) NTIS Order No. PB 87- 100012	Standard Industrial Classification Manual, 1987	NR 400.02(74) NR 400.02(86) NR 400.02(91)
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NR 400.02(149)  
NR 405.02(8)  
NR 407.02(4) (intro.)  
NR 407.05(4) (b)  
NR 408.02(5)  
NR 410.02(4)  
NR 421.02(3)  
NR 421.02(17)  
NR 422.02(112)  
NR 422.095(1)  
NR 422.15(1) (intro.)  
NR 438.02(1)  
NR 465.02(51)

SECTION 9. NR 484.06(intro.) is amended to read:

NR 484.06(intro.) The following materials from other government organizations listed in the first column of Tables 4A to ~~4D~~ 4E are incorporated by reference for the corresponding sections of chs. NR 400 to 439 and 445 to 499 in the third column of Tables 4A to ~~4D~~ 4E.

SECTION 10. NR 484.06(5) is created to read:

NR 484.06(5) The following are documents from the State of California, Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation.

Note: Copies may be downloaded for personal use from the following Internet address:  
<http://www.dca.ca.gov/bhfti/bulletin.htm>.

Those without access to a computer can obtain printed copies from:

State of California

Department of Consumer Affairs

Bureau of Home Furnishings and Thermal Insulation  
3485 Orange Grove Avenue  
North Highlands CA 95660-5595  
(916) 920-6951

**Table 4E**  
**State of California Document Reference**

Document Number	Title	Incorporated by Reference For
(a) Technical Bulletin 116	Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Upholstered Furniture	NR 465.04 (1) (b)1.
(b) Technical Bulletin 117	Requirements, Test Procedure and Apparatus for Testing the Flame Retardance of Resilient Filling Materials Used in Upholstered Furniture	NR 465.04 (1) (b)1.
(c) Technical Bulletin 133	Flammability Test Procedure for Seating Furniture for Use in Public Occupancies	NR 465.04 (1) (b)1.

SECTION 11. NR 484.11(7) and Table 6G are renumbered 484.11(8) and Table 6H.

SECTION 12. NR 484.11(7) is created to read:

NR 484.11(7) The following is a document from The Business and Institutional Furniture Manufacturer's Association (BIFMA).

Note: Copies may be purchased for personal use from:

BIFMA International  
2680 Horizon Drive SE, Suite A-1  
Grand Rapids MI 49546-7500  
E-mail: email@bifma.org  
Phone: (616) 285-3963  
Fax: (616) 285-3765

**Table 6G**  
**BIFMA Document Reference**

Document Number	Title	Incorporated by Reference For
BIFMA X5.7-1991	Voluntary Upholstered Furniture Flammability Standard for Non-residential, Non-live-in Occupancies	NR 465.04(1)(b)1.

SECTION 13. NR 484.11(10) is created to read:

NR 484.11(10) The following are documents from the Upholstered Furniture Action Council (UFAC).

Note: Copies may be purchased for personal use from:

Upholstered Furniture Action Council

Box 2436

High Point, NC 27261

Phone: (336) 885-5065

Fax: (336) 885-5072

**Table 6J**  
**UFAC Document Reference**

Document Number	Title	Incorporated by Reference For
(a) DMTM--1990	Decking Materials Test Method--1990	NR 465.04 (1) (b)1.
(b) WCTM--1990	Welt Cord Test Method--1990	NR 465.04 (1) (b)1.
(c) IFTM--1990	Interior Fabrics Test Method--1990	NR 465.04 (1) (b)1.
(d) F/PCTM--1990, PT A	Filling/Padding Component Test Method--1990 Part A - For Slab or Garnetted Materials	NR 465.04 (1) (b)1.
(e) F/PCTM--1990, PT B	Filling/Padding Component Test Method--1990 Part B - For Fibrous or Particulate Materials  Barrier Test Method--1990	NR 465.04 (1) (b)1.

- |                |   |                      |
|----------------|---|----------------------|
| (f) PTM--1990  | Fabric Classification Test<br>Method--1990  | NR 465.04 (1) (b) 1. |
| (g) FCTM--1990 | Standard Test Methods for<br>Decorative Trims, Edging,<br>and Brush Fringes--1993 | NR 465.04 (1) (b) 1. |
| (h) DTTM--1993 |   | NR 465.04 (1) (b) 1. |

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The foregoing rule was approved and adopted by the State of Wisconsin Natural Resources Board on April 25, 2001.

The rule shall take effect the first day of the month following publication in the Wisconsin administrative register as provided in s. 227.22(2)(intro.), Stats.

Dated at Madison, Wisconsin \_\_\_\_\_.

STATE OF WISCONSIN  
DEPARTMENT OF NATURAL RESOURCES

By \_\_\_\_\_  
Darrell Bazzell, Secretary

(SEAL)