



Ohio Administrative Code

Rule 3745-21-28 Miscellaneous industrial adhesives and sealants.

Effective: [March 27, 2022](#)

[Comment: For dates and availability of non-regulatory government publications, publications of recognized organizations and associations, federal rules, and federal statutory provisions referenced in this rule, see paragraph (JJ) of rule 3745-21-01 of the Administrative Code titled "referenced materials."]

(A) Applicability.

(1) Except as provided in paragraph (A)(2) of this rule, paragraphs (B) to (G) of this rule shall apply to each miscellaneous industrial adhesive and sealant application process that meet the following:

(a) The total actual VOC emissions from all miscellaneous industrial adhesive and sealant application processes (including emissions from surface preparation and cleanup activities) at the facility are equal to or greater than 3.0 tons per twelve-month rolling period before the application of control systems and devices.

(b) The miscellaneous industrial adhesive and sealant application process is located at a facility in Ashtabula, Butler, Clermont, Cuyahoga, Geauga, Hamilton, Lake, Lorain, Medina, Portage, Summit, or Warren county.

(2) Paragraphs (C)(1), (D) and (E) of this rule shall not apply to the following:

(a) Adhesives, sealants, adhesive primers or sealant primers being tested or evaluated in any research and development, quality assurance or analytical laboratory.

(b) Adhesives, sealants, adhesive primers or sealant primers used in the assembly, repair and manufacture of aerospace or undersea-based weapon systems.

(c) Adhesives, sealants, adhesive primers or sealant primers used in the manufacturing of medical



equipment.

(d) Aerosol adhesive and aerosol adhesive primer application processes.

(e) Cyanoacrylate adhesives.

(f) Processes using adhesives, sealants, adhesive primers or sealant primers that are supplied by the manufacturer in containers with a net volume of sixteen fluid ounces or less, or a net weight of one pound or less. Any owner or operator of a facility claiming exemption pursuant to this subparagraph shall record and maintain records in accordance with paragraph (H)(2) of this rule.

(g) Processes using polyester bonding putties to assemble fiberglass parts at fiberglass boat manufacturing facilities and at other reinforced plastic composite manufacturing facilities.

(h) Digital printing operations.

(3) Paragraphs (B) to (H) of this rule shall not apply to miscellaneous industrial adhesive and sealant application processes for which the owner or operator is required to comply with the following:

(a) Rule 3745-21-19 of the Administrative Code for aerospace.

(b) Paragraph (I)(4) of rule 3745-21-09 of the Administrative Code for metal furniture.

(c) Paragraph (K)(6) of rule 3745-21-09 of the Administrative Code for large appliances.

(d) Rule 3745-21-24 of the Administrative Code for flatwood paneling.

(e) Paragraph (F)(2) of rule 3745-21-09 of the Administrative Code for paper, film, and foil.

(f) Rule 3745-21-22 of the Administrative Code for offset lithographic printing and letterpress printing facilities.

(g) Paragraph (Y)(4) of rule 3745-21-09 of the Administrative Code for flexographic, packaging



rotogravure and publication rotogravure printing lines.

(h) Paragraph (E) of rule 3745-21-09 of the Administrative Code for coil coatings.

(i) Paragraph (G) of rule 3745-21-09 of the Administrative Code for fabric coatings.

(j) Paragraph (X) of rule 3745-21-09 of the Administrative Code for rubber tire manufacturing.

(k) Rule 3745-21-25 of the Administrative Code for control of volatile organic compound emissions from reinforced plastic composites production operations.

(l) Rule 3745-21-29 of the Administrative Code for control of volatile organic compound emissions from automobile and light-duty truck assembly coating operations, heavier vehicle assembly coating operations and cleaning operations associated with these coating operations.

(B) The definitions applicable to this rule are contained in paragraphs (A), (B), and (II) of rule 3745-21-01 of the Administrative Code.

(C) VOC limitation standards.

(1) The VOC content limitations in table 1 of this rule for adhesives, sealants, adhesive primers or sealant primers applied to particular substrates shall apply as follows:

(a) If an owner or operator uses an adhesive, sealant, adhesive primer or sealant primer subject to a specific VOC content limit in table 1 of this rule, such specific limitation is applicable rather than an adhesive-to-substrate limitation as presented in table 1 of this rule.

(b) If an adhesive is used to bond dissimilar substrates together, the applicable substrate category with the highest VOC content shall be the limitation for such use.

(c) All adhesives, sealants, adhesive primers or sealant primers shall be applied using one of the following application methods: electrostatic spray, HVLP spray, flow coat, roll coat, dip coat (including electrodeposition), airless spray, or air-assisted airless spray. An equivalent coating



application method capable of achieving similar transfer efficiencies to HVLP may be approved by the director on a case-by-case basis.

Adhesive, sealant, adhesive primer or sealant primer category	VOC content limitation (pounds per gallon, excluding water and exempt solvents)
ABS welding	3.3
Ceramic tile installation	1.1
Computer diskette jacket manufacturing	7.1
Contact bond	2.1
Cove base installation	1.3
CPVC welding	4.1
Indoor floor covering installation	1.3
Metal to urethane/rubber molding or casting	7.1
Motor vehicle adhesive	2.1
Motor vehicle weatherstrip adhesive	6.3
Multipurpose construction	1.7
Non-membrane roof installation/repair	2.6
Other plastic cement welding	4.3
Outdoor floor covering installation	2.1
PVC welding	4.3
Single-ply roof membrane installation/repair	2.1
Structural glazing	0.8
Thin metal laminating	6.5
Tire repair	0.8
Perimeter bonded sheet vinyl flooring installation	5.5
Waterproof resorcinol glue	1.4
Sheet-applied rubber installation	7.1
Sealants:	
Architectural	2.1
Marine deck	6.4
Non-membrane roof installation/repair	2.6
Roadway	2.1
Single-ply roof membrane	3.8



Other	3.6
Adhesive primers:	
Automotive glass	7.5
Plastic cement welding	5.4
Single-ply roof membrane	2.1
Traffic marking tape	1.3
Other	2.1
Sealant primers:	
Non-porous architectural	2.1
Porous architectural	6.5
Marine deck	6.4
Other	6.3
Adhesives applied to the listed substrate (Adhesive-to-substrate limitations):	
Flexible vinyl	2.1
Fiberglass	1.7
Metal	0.3
Porous material (except wood)	1.0
Wood	0.3
Rubber	2.1
Other substrates	2.1

(2) An owner or operator of each miscellaneous industrial adhesive and sealant application process using an adhesive, sealant, adhesive primer or sealant primer subject to paragraph (C)(1) of this rule may use add-on air pollution control equipment, in lieu of complying with the VOC content limitations of table 1 of this rule, if such equipment meets the following:

- (a) The VOC emissions from the use of all adhesives, sealants, adhesive primers or sealant primers subject to this rule are reduced by an overall capture and control efficiency of at least eighty-five per cent, by weight.
- (b) The combustion temperature is monitored continuously if a thermal incinerator is operated.
- (c) One of the following if a catalytic incinerator is operated:



- (i) The inlet and exhaust gas temperatures are monitored continuously.

- (ii) If an owner or operator elects to implement an inspection and maintenance plan for the catalytic incinerator that meets paragraph (C)(2)(f) of this rule, only the inlet gas temperature is monitored continuously.

- (d) Control device efficiency is monitored continuously if a carbon absorber or control device other than a thermal or catalytic incinerator is operated.

- (e) Operation records sufficient to demonstrate compliance with the requirements of this subdivision are maintained as required by paragraph (D) of this rule.

- (f) For an owner or operator that elects to monitor the inlet temperature only of the catalytic incinerator, in accordance with paragraph (C)(2)(c)(ii) of this rule, an inspection and maintenance plan shall be developed, maintained on-site, and made readily available upon the request of the appropriate Ohio EPA district office or local air agency. At a minimum, the plan shall include the following:
 - (i) Annual sampling and analysis of the catalyst activity (i.e., conversion efficiency) following the manufacturer's or catalyst supplier's recommended procedures.

 - (ii) Monthly inspection of the oxidizer system including the burner assembly and fuel supply lines for problems.

 - (iii) Annual internal and monthly external visual inspection of the catalyst bed to check for channeling, abrasion, and settling. If problems are found, corrective action consistent with the manufacturer's recommendations shall be implemented and a new performance test to determine destruction efficiency in accordance with paragraph (C) of rule 3745-21-10 of the Administrative Code shall be conducted.

- (3) Any owner or operator of a miscellaneous industrial adhesive and sealant application process using adhesives, sealants, adhesive primers, sealant primers, surface preparation solvents or cleanup



solvents subject to this rule shall do the following:

- (a) Store all VOC-containing adhesives, adhesive primers, and process-related waste materials in closed containers.
 - (b) Store all VOC-containing cleaning materials and used shop towels in closed containers.
 - (c) Ensure that mixing and storage containers used for VOC-containing cleaning materials, adhesives, adhesive primers, and process-related waste materials are kept closed at all times except when depositing or removing these materials.
 - (d) Minimize spills of VOC-containing cleaning materials, adhesives, adhesive primers, and process-related waste materials.
 - (e) Convey VOC-containing cleaning materials, adhesives, adhesive primers, and process-related waste materials from one location to another in closed containers or pipes.
 - (f) Minimize VOC emission from cleaning of application, storage, mixing, and conveying equipment by ensuring that equipment cleaning is performed without atomizing the cleaning solvent and all spent solvent is captured in closed containers.
- (4) The provisions of paragraphs (C)(1) to (C)(3) of this rule shall not apply to any emissions unit that meets the following:
- (a) The director has determined that the otherwise applicable emission limitation in paragraph (C) of this rule is technically or economically infeasible and has established an alternative reasonably available control technology emission limitation. The alternative limitation shall be the lowest emission limitation that the adhesives, adhesive primers, sealants and sealant primers operation is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. The alternative limitation shall be an emissions rate (e.g., pounds VOC per gallon) or overall per cent reduction but shall not be in terms of mass per time (e.g., pounds per hour).



(b) A final permit-to-install or permit-to-install and operate has been issued for the emissions unit pursuant to Chapter 3745-31 of the Administrative Code which contains terms and conditions that specify the control requirement or emission limitation that are the basis for the director's alternative limitation determination for the emissions unit, as described in paragraph (C)(4)(a) of this rule, and the permit-to-install or permit-to-install and operate has been issued by the Ohio EPA in a manner that makes the alternative limitation federally enforceable.

(c) USEPA has approved the alternative limitation as a revision to the Ohio state implementation plan.

(D) Recordkeeping and reporting.

(1) The owner or operator of each miscellaneous industrial adhesive and sealant application process subject to this rule shall maintain records demonstrating compliance with this rule, including, but not limited to, the following information:

(a) A list of each adhesive, sealant, adhesive primer, and sealant primer in use and in storage.

(b) A data sheet or material list which provides the material name, manufacturer identification, and material application.

(c) Catalysts, reducers or other components used and the mix ratio.

(d) The VOC content of each product as supplied.

(e) The final VOC content as applied.

(f) The monthly volume of each adhesive, sealant, adhesive primer, and sealant primer used.

(2) Any owner or operator of a miscellaneous industrial adhesive and sealant application process who complies with paragraph (C)(2) of this rule in lieu of paragraph (C)(1) of this rule through the use of add-on air pollution control equipment shall record the key operating parameters for the control equipment, including but not limited to, the following information:



(a) On a daily basis, the combustion temperature, inlet and exhaust gas temperatures and control device efficiency, as appropriate, pursuant to paragraph (C)(2) of this rule.

(b) Daily hours of operation.

(c) All maintenance performed including the date and type of maintenance.

(d) Any owner or operator of a miscellaneous industrial adhesive and sealant application process electing to comply with paragraph (C)(2)(c)(ii) of this rule, records, and a description of the results of each inspection and catalyst activity analysis, as specified in paragraph (C)(2)(f) of this rule, shall be maintained.

(3) All records made to determine compliance with this rule shall be maintained for five years from the date such record is created and shall be made available to the director or any authorized representative of the director within ninety days of a request.

(E) Compliance procedures and test methods.

(1) Except as provided in paragraphs (E)(3) to (E)(4) of this rule, the VOC and solids content of all non-aerosol adhesives, and adhesive primers shall be determined using USEPA method 24, as identified in 40 CFR part 60, appendix A.

(2) The organic content of exempt organic compounds shall be determined using ASTM D4457, as applicable.

(3) The VOC content of any plastic cement welding adhesive or primer shall be determined using SCAQMD method 316A.

(4) To determine if a diluent is a reactive diluent, the percent of the reactive organic compound that becomes an integral part of the finished materials shall be determined using SCAQMD method 316A.



(5) For adhesives that do not contain reactive diluents, pounds of VOC per gallon of adhesive, less water and exempt compounds, shall be calculated according to the following equation:

$$\text{Pounds of VOC per gallon of adhesive} = (W_s - W_w - W_e) / (V_m - V_w - V_e)$$

Where:

W_s = weight of volatile compounds, in pounds.

W_w = weight of water, in pounds.

W_e = weight of exempt compounds, in pounds.

V_m = volume of material, in gallons.

V_w = volume of water, in gallons.

V_e = volume of exempt compounds, in gallons.

(6) For adhesives that contain reactive diluents, the VOC content of the adhesive is determined after curing. The pounds of VOC per gallon of adhesive, less water and exempt compounds, shall be calculated according to the following equation:

$$\text{Pounds of VOC per gallon of adhesive} = (W_{rs} - W_{rw} - W_{re}) / (V_{rm} - V_{rw} - V_{re})$$

Where:

W_{rs} = weight of volatile compounds not consumed during curing, in pounds.

W_{rw} = weight of water not consumed during curing, in pounds.

W_{re} = weight of exempt compounds not consumed during curing, in pounds.



V_{rm} = volume of material not consumed during curing, in gallons.

V_{rw} = volume of water not consumed during curing, in gallons.

V_{re} = volume of exempt compounds not consumed during curing, in gallons.

(7) Pounds of VOC per gallon of material shall be calculated according to the following equation:

$$\text{Pounds of VOC per gallon of material} = (W_s - W_w - W_e) / V_m$$

Where:

W_s = weight of volatile compounds, in pounds.

W_w = weight of water, in pounds.

W_e = weight of exempt compounds, in pounds.

V_m = volume of material, in gallons.

(8) Per cent VOC by weight shall be calculated according to the following equation:

$$\% \text{ VOC by weight} = (W_v / W) \times 100$$

Where:

W_v = weight of VOCs in pounds.

W = weight of material in pounds.

(9) If add-on air pollution control equipment is used to meet this rule, the following emissions testing shall be applicable:



(a) The general provisions specified under paragraphs (A)(2) to (A)(5) of rule 3745-21-10 of the Administrative Code shall apply to compliance testing.

(b) The test methods and procedures of paragraph (C) of rule 3745-21-10 of the Administrative Code shall be followed.

For the purpose of demonstrating compliance with the emission control requirements of paragraph (C)(2) of this rule, the affected source shall be run at typical operating conditions and flow rates compatible with scheduled production during any emission testing.

(F) Compliance dates.

(1) The owner or operator of a miscellaneous industrial adhesive and sealant application process subject to this rule shall comply with this rule no later than the following dates:

(a) For any subject miscellaneous industrial adhesive and sealant application process located in Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, or Summit county for which installation commenced before May 12, 2011, the compliance date for the process is either May 12, 2012 or the date of initial startup of the process, whichever is later.

(b) For any subject miscellaneous industrial adhesive and sealant application process located in Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, or Summit county for which installation commenced on or after May 12, 2011, the compliance date for the process is the initial startup date of the process.

(c) For any miscellaneous industrial adhesive and sealant application process located in Butler, Clermont, Hamilton or Warren county for which installation commenced before the effective date of this rule, the compliance date is either March 1, 2023 or the date of initial startup of the process, whichever is later.

(d) For any miscellaneous industrial adhesive and sealant application process located in Butler, Clermont, Hamilton or Warren county for which installation commenced on or after the effective date of this rule, the compliance date is the date of initial startup of the the process.



(2) The owner or operator of a miscellaneous industrial adhesive and sealant application process that is subject to this rule shall demonstrate compliance with paragraph (C)(2) of this rule by testing the control device on each subject source in accordance with paragraph (E)(9) of this rule according to the following:

(a) For any owner or operator of a miscellaneous industrial adhesive and sealant application process subject to paragraph (F)(1)(a) of this rule, by no later than ninety days after the process's compliance date. In addition, the Ohio EPA may accept the results of an emission test conducted prior to May 12, 2011, if the owner or operator provides information and data to the Ohio EPA which demonstrate that the test was witnessed by the Ohio EPA or local air agency, that an approved USEPA emission test method was employed, and that the operation of the process was consistent with the current operating conditions and operating capacity.

(b) For any owner or operator of a miscellaneous industrial adhesive and sealant application process subject to paragraph (F)(1)(b) of this rule, within one hundred eighty days after the miscellaneous industrial adhesive and sealant application process's compliance date.

(3) Additional testing of a subject miscellaneous industrial adhesive and sealant application process and its VOC add-on air pollution control equipment in accordance with paragraph (E)(9) of this rule may be required by the director to ensure continued compliance.

(G) Applicability notification, compliance certification, and permit application.

(1) The owner or operator of a miscellaneous industrial adhesive and sealant application process that is subject to this rule, is located in located in Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, or Summit county, and has an initial startup before May 12, 2011 shall notify the appropriate Ohio EPA district office or local air agency in writing that the process is subject to this rule not later than July 11, 2011 (or within sixty days after the process becomes subject to this rule), providing the information specified in paragraph (G)(5) of this rule.

(2) The owner or operator of a miscellaneous industrial adhesive and sealant application process that is subject to this rule, is located in Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, or



Summit county, and has an initial startup on or after May 12, 2011 shall notify the appropriate Ohio EPA district office or local air agency in writing that the process is subject to this rule not later than either the date of initial startup of the subject process or July 11, 2011 (whichever is later), providing the information specified in paragraph (G)(5) of this rule. The application for a permit-to-install under rule 3745-31-02 of the Administrative Code may be used to fulfill the notification requirements of this paragraph.

(3) The owner or operator of a miscellaneous industrial adhesive and sealant application process that is subject to this rule, is located in Butler, Clermont, Hamilton or Warren county, and has an initial startup of shipbuilding or ship repair operations before the effective date of this rule shall notify the appropriate Ohio EPA district office or local air agency in writing that the process is subject to this rule not later than sixty days after the effective date of this rule, providing the information specified in paragraph (G)(5) of this rule.

(4) The owner or operator of a miscellaneous industrial adhesive and sealant application process that is subject to this rule, is located in Butler, Clermont, Hamilton or Warren county, and has an initial startup of shipbuilding or ship repair operations on or after the effective date of this rule shall notify the appropriate Ohio EPA district office or local air agency in writing that the process is subject to this rule not later than either the date of initial startup of the subject process or sixty days after the effective date of this rule (whichever is later), providing the information specified in paragraph (G)(5) of this rule. The application for a permit-to-install under rule 3745-31-02 of the Administrative Code may be used to fulfill the notification requirements of this paragraph.

(5) The notification required in paragraphs (G)(1) to (G)(4) of this rule shall provide the following information:

(a) Name and address of the owner or operator.

(b) Address (i.e., physical location) of the facility.

(c) Equipment description and Ohio EPA application number (if assigned) of the subject process.

(d) Identification of the VOC emission requirement, the means of compliance, and the compliance



date for the subject process.

(e) An application for an operating permit or an application for a modification to an operating permit in accordance with Chapter 3745-77 of the Administrative Code (for sources subject to the Title V permit program) or an application for a permit-to-install and operate or an application for a modification to a permit-to-install and operate in accordance with Chapter 3745-31 of the Administrative Code (for sources not subject to the Title V permit program) for each subject process that meets one of the following:

(i) The process does not possess an effective operating permit or permit-to-install and operate.

(ii) The process possesses an effective operating permit or permit-to-install and operate and the owner or operator cannot certify in writing to the director that such subject process is in compliance with this rule. An application for an operating permit or permit-to-install and operate is not required provided the subject process is operating under an effective permit and certifies compliance. Such certification shall include all compliance certification requirements under paragraph (G)(6) of this rule.

(6) Compliance certification.

(a) The owner or operator of a miscellaneous industrial adhesive and sealant application process that is subject to this rule shall notify the Ohio EPA district office or local air agency in writing within thirty days following the completion of any of the following:

(i) For a process subject to the VOC emission requirements in paragraphs (C)(1) and (C)(3) of this rule, the first documented achievement of compliance with each of the requirements.

(ii) For a process subject to the VOC add-on air pollution control equipment in paragraph (C)(2) of this rule, the following:

(a) The completion of installation and initial use of a VOC emission control system for subject process.



(b) The completion of installation and initial use of any monitoring devices required under paragraph (C)(2) of this rule for the subject process.

(c) The completion of any compliance testing conducted in accordance with paragraph (F)(2) of this rule to demonstrate compliance with the applicable control requirements.

(b) The compliance certification under paragraph (G)(6)(a) of this rule shall provide the following, where applicable:

(i) A description of the requirements.

(ii) A description of the VOC emission control system.

(iii) A description of the monitoring devices.

(iv) A description of the records that document continuing compliance.

(v) The results of any compliance tests, including documentation of test data.

(vi) The results of any records that document continuing compliance, including calculations.

(vii) A statement by the owner or operator of the facility as to whether the subject process has complied with the requirements.

(H) Requirements for an owner or operator of a miscellaneous industrial adhesive and sealant application process that determines they are not subject to one or more of the following:

(1) The owner or operator of a miscellaneous industrial adhesive and sealant application process that determines the total actual VOC emissions, before the application of air pollution control systems, from all miscellaneous industrial adhesive application processes (including emissions from surface preparation and cleanup activities) at the facility are not equal to or greater than the limitation specified in paragraph (A)(1)(a) of this rule, and, therefore, the facility is not subject to paragraphs (B) to (G) of this rule, shall select one of the following methods and maintain the following records



for a period of five years:

(a) Monthly recordkeeping method, as follows:

(i) Total pounds or gallons of each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent used per calendar month.

(ii) VOC content (per cent by weight or pounds per gallon, whichever is consistent with the records kept in paragraph (H)(1)(a)(i) of this rule) of each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent used per calendar month.

(iii) The total monthly VOC emissions, before the application of capture systems and control devices, in pounds for all adhesives, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent employed per calendar month.

(iv) The rolling twelve-month summation of VOC emissions, in tons, before the application of control systems and devices. The rolling twelve-month summation shall be calculated as the total VOC emissions for the current calendar month, plus the total VOC emissions from the previous eleven calendar months.

(b) Daily emissions method.

Provided total VOC emissions are less than 15.0 pounds per day, the owner or operator may elect to maintain the following records in lieu of the records required under paragraph (H)(1)(a) of this rule:

(i) Total pounds or gallons of each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent used per day.

(ii) VOC content (per cent by weight or pounds per gallon, whichever is consistent with the records kept in paragraph (H)(1)(b)(i) of this rule) of each adhesive, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent used per day.

(iii) The total daily VOC emissions, before the application of capture systems and control devices, in



pounds for all adhesives, sealant, adhesive primer, sealant primer, cleanup solvent and surface preparation solvent employed per day.

(2) The owner or operator of a miscellaneous industrial adhesive application process that determines the process is not subject to paragraphs (C)(1), (D) and (E) of this rule because the use of all adhesives, sealants, adhesive primers or sealant primers in all processes are supplied by the manufacturer in containers with a net volume of sixteen fluid ounces or less, or a net weight of one pound or less, in accordance with paragraph (A)(2)(f) of this rule, shall maintain records for a period of five years identifying that all supplied containers of said materials meet the exemption.