SUBPART EE - Standards of Performance for Surface Coating of Metal Furniture (Adopted 3/4/86: Delegation Effective 3/19/87: Rev. Effective 11/3/92)

RULE 260.310. APPLICABILITY AND DESIGNATION OF AFFECTED FACILITY

(a) The affected facility to which the provisions of this subpart apply is each metal furniture surface coating operation in which organic coatings are applied.

(b) This subpart applies to each affected facility identified in Section (a) of this rule on which construction, modification, or reconstruction is commenced after November 28, 1980.

(c) Any owner or operator of a metal furniture surface coating operation that uses less than 3842 liters (1015 gallons) of coating (as applied) per year and keeps purchase or inventory records or other data necessary to substantiate annual coating usage shall be exempt from all other provisions of this subpart. These records shall be maintained at the source for a period of at least 2 years.

RULE 260.311. DEFINITIONS AND SYMBOLS

All terms used in this subpart not defined below are given the meaning in Subpart A of this Regulation.

(a) "**Bake Oven**" means a device which uses heat to dry or cure coatings.

(b) "**Dip Coating**" means a method of applying coatings in which the part is submerged in a tank filled with the coatings.

(c) "**Electrodeposition (EDP)**" means a method of applying coating in which the part is submerged in a tank filled with the coatings and in which an electrical potential is used in enhance deposition of the coatings on the part.

(d) "**Electrostatic Spray Application**" means a spray application method that uses an electrical potential to increase the transfer efficiency of the coating.

(e) "**Flash-Off Area**" means the portion of a surface coating operation between the coating application area and bake oven.

(f) "**Flow Coating**" means a method in applying coatings in which the part is carried through a chamber containing numerous nozzles which direct unatomized streams of coatings from many different angles onto the surface of the part.

(g) "**Organic Coating**" means any coating used in a surface coating operation, including dilution solvents, from which volatile organic compound emissions occur during the

application or the curing process. For the purpose of this rule, powder coatings are not included in this definition.

(h) "**Powder Coating**" means any surface coating which is applied as a dry powder and is fused into a continuous coating film through the use of heat.

(i) "**Spray Application**" means a method of applying coatings by atomizing and directing the atomized spray toward the part to be coated.

(j) "**Surface Coating Operation**" means the system on a metal furniture surface coating line used to apply and dry or cure an organic coating on the surface of the metal furniture part or product. The surface coating operation may be a prime coat or a top coat operation and includes the coating application station(s), flash-off area, and curing oven.

(k) "**Transfer Efficiency**" means the ratio of the amount of coating solids deposited onto the surface of a part or product to the total amount of coating solids used.

(l) "**VOC Content**" means the proportion of a coating that is volatile organic compounds (VOC's), expressed as kilograms of VOC's per liter of coating solids.

(m) "**VOC Emissions**" means the mass of volatile organic compounds (VOC's), expressed as kilograms of VOC's per liter of applied coating solids, emitted from a metal furniture surface coating operation.

All symbols used in this subpart not defined below are given the meaning in Subpart A of this Regulation.

C_a = the VOC concentration in each gas stream leaving the control device and entering the atmosphere (parts per million by volume, as carbon)

C_b = the VOC concentration in each gas stream entering the control device (parts per million by volume, as carbon)

C_f = the VOC concentration in each gas stream emitted directly to the atmosphere (parts per million by volume, as carbon)

D_e = density of each coating, as received (kilograms per liter)

D_d = density of each diluent VOC-solvent (kilograms per liter)

D_r = density of VOC-solvent recovered by an emission control device (kilograms per liter)

E = VOC destruction efficiency of the control device (fraction)

F = the proportion of total VOC's emitted by an affected facility that enters the control device (fraction)

G = the volume-weighted average mass of VOC's in coatings consumed in a calendar month per unit volume of coating solids applied (kilograms per liter)

L_c = the volume of each coating consumed, as received (liters)

L_d = the volume of each diluent VOC-solvent added to coatings (liters)

L_r = the volume of VOC-solvent recovered by an emission control device (liters)

L_s = the volume of coating solids consumed (liters)

M_d = the mass of diluent VOC-solvent consumed (kilograms)

M_o = the mass of VOC's in coatings consumed, as received (kilograms)

M_r = the mass of VOC's recovered by an emission control device (kilograms)

N = the volume weighted average mass of VOC emissions to the atmosphere per unit volume of coating solids applied (kilograms per liter)

Q_a = the volumetric flow rate of each gas stream leaving the control device and entering the atmosphere (dry standard cubic meters per hour)

Q_b = the volumetric flow rate of each gas stream entering the control device (dry standard cubic meters per hour)

Q_f = the volumetric flow rate of each gas stream emitted directly to the atmosphere (dry standard cubic meters per hour)

R = the overall VOC emission reduction achieved for an affected facility (fraction)

T = the transfer efficiency (fraction)

V_s = the proportion of solids in each coating (or input stream), as received (fraction by volume)

W_o = the proportion of VOC's in each coating (or input stream), as received (fraction by weight)

RULE 260.312. STANDARD FOR VOLATILE ORGANIC COMPOUNDS (VOC)

(a) On and after the date of which the initial performance test required to be conducted by Rule 260.8(a) is completed, no owner or operator subject to the provisions of this subpart

shall cause the discharge into the atmosphere of VOC emissions from any metal furniture surface coating operation in excess of 0.90 kilogram of VOC per liter of coating solids applied.

RULE 260.313. PERFORMANCE TESTS AND COMPLIANCE PROVISIONS

(a) Rule 260.8(d) and 260.8(f) do not apply to the performance test procedures required by this subpart.

(b) The owner or operator of an affected facility shall conduct an initial performance test as required under Rule 260.8(a) and thereafter a performance test each calendar month for each affected facility according to the procedures in this rule.

(c) The owner or operator shall use the following procedures for determining monthly volume-weighted average emissions of VOC's in kilograms per liter of coating solids applied (G).

(1) An owner or operator shall use the following procedures for any affected facility which does not use a capture system and control device to comply with the emissions limit specified under Rule 260.312. The owner or operator shall determine the composition of the coatings by formulation data supplied by the manufacturer of the coating or by an analysis of each coating, as received, using Reference Method 24. The Control Officer may require the owner or operator who uses formulation data supplied by the manufacturer of the coating to determine the VOC content of coatings using Reference Method 24. The owner or operator shall determine the volume of coating and the mass VOC-solvent used for thinning purposes from company records on a monthly basis. If a common coating distribution system serves more than one affected facility or serves both affected and existing facilities, the owner or operator shall estimate the volume of coating used at each facility by using the average dry weight of coating and the surface area coated by each affected and existing facility or by other procedures acceptable to the Control Officer.

(i) Calculate the volume-weighted average of the total mass of VOC's consumed per unit volume of coating solids applied (G) during each calendar month for each affected facility, except as provided under Rule 260.313(c)(2) and (c)(3). Each monthly calculation is considered a performance test. Except as provided in Subsection (c)(1)(iv) of this rule, the volume-weighted average of the total mass of VOC's consumed per unit volume of coating solids applied (G) each calendar month will be determined by the following procedures.

(A) Calculate the mass of VOC's used ($M_o + M_d$) during each calendar month for each affected facility by the following equation:

$$M_o + M_d = \sum_{i=1}^{n} L_{ci} D_{ci} W_{oi} + \sum_{i=1}^{m} L_{dj} D_{dj}$$

($L_{dj}D_{dj}$ will be 0 if no VOC solvent is added to the coatings, as received.)

Where: n is the number of different coatings used during the calendar month and m is the number of different diluent VOC-solvents used during the calendar month.

(B) Calculate the total volume of coating solids used (L_s) in each calendar month for each affected facility by the following equation:

$$L_s = \sum_{i=1}^{n} L_{ci} V_{si}$$

Select the appropriate transfer efficiency from Table 1. If the owner or operator can demonstrate to the satisfaction of the Control Officer that other transfer efficiencies other than those shown are appropriate, the Control Officer will approve their use on a case-by-case basis. Transfer efficiency values for application methods not listed below shall be determined by the Control Officer on a case-by-case basis. An owner or operator must submit sufficient data for the Control Officer to judge the accuracy of the transfer efficiency claims.

TABLE 1. TRANSFER EFFICIENCIES

Application Methods	Transfer Efficiency (T)
Air atomized spray	0.25
Airless spray	.25
Manual electrostatic spray	.60
Nonrotational automatic electrostatic spray	.70
Rotating head electrostatic spray . . . . . (manual & automatic)	.80
Dip coat and flow coat	.90
Electrodeposition	.95

Where more than one application method is used within a single surface coating operation, the owner or operator shall determine the composition and volume of each coating applied by each method through a means acceptable to the Control Officer and compute the weighted average transfer efficiency by the following equation:

$$T = \frac{\sum_{i=1}^{n} \sum_{k=1}^{p} L_{cik} V_{sik} T_k}{L_s}$$

Where n is the number of coatings used and p is the number of application methods used.

(C) Calculate the volume weighted average mass of VOC's consumed per unit volume of coating solids applied (G) during the calendar month for each affected facility by the following equation:

$$G = \frac{M_o + M_d}{L_s T}$$

(ii) Calculate the volume-weighted average of VOC emissions to the atmosphere (N) during the calendar month for each affected facility by the following equation:

$$N = G$$

(iii) Where the volume-weighted average mass of VOC discharged to the atmosphere per unit volume of coating solids applied (N) is less than or equal to 0.90 kilogram per liter, the affected facility is in compliance.

(iv) If each individual coating used by an affected facility has a VOC content, as received, which when divided by the lowest transfer efficiency at which the coating is applied, results in a value equal to or less than 0.90 kilogram per liter, the affected facility is in compliance provided no VOC's are added to the coatings during distribution or application.

(2) An owner or operator shall use the following procedures for any affected facility that uses a capture system and a control device that destroys VOC's (e.g., incinerator) to comply with the emission limit specified in Rule 260.312.

(i) Determine the overall reduction efficiency (R) for the capture system and control device. For the initial performance test the overall reduction efficiency (R) shall be determined as prescribed in Subsections (c)(2)(i)(A), (B), and (C) of this rule. In subsequent months, the owner or operator may use the most recently determined overall reduction efficiency (R) for the performance test providing control device and capture system operating conditions have not changed. The procedure is Subsections (c)(2)(i)(A), (B), and (C), of the rule shall be repeated when directed by the Control Officer or when the owner or operator elects to operate the control device or capture system at conditions different from the initial performance test.

(A) Determine the fraction (F) of total VOC's emitted by an affected facility that enters the control device using the following equation:

$$F = \frac{\sum_{i=1}^{n} C_{bi} Q_{bi}}{\sum_{i=1}^{n} C_{bi} Q_{bi} + \sum_{i=1}^{m} C_{fj} Q_{fj}}$$

Where n is the number of gas streams entering the control device and m is the number of gas streams emitted directly to the atmosphere.

(B) Determine the destruction efficiency of the control device (E) using values of the volumetric flow rate of each of the gas streams and the VOC content (as carbon) of each of the gas streams in and out of the device by the following equation:

$$F = \frac{\sum_{i=1}^{n} Q_{bi}C_{bi} - \sum_{i=1}^{m} Q_{aj}C_{aj}}{\sum_{i=1}^{n} Q_{bi}C_{bi}}$$

Where: n is the number of gas streams entering the control device, and m is the number of gas streams leaving the control device and entering the atmosphere.

(C) Determine overall reduction efficiency (R) using the following equation:

$$R = E$$

(ii) Calculate the volume-weighted average of the total mass of VOC's per unit volume of coating solids applied (G) during each calendar month for each affected facility using equations in Subsections (c)(1)(i)(A), (B), and (C) of this rule.

(iii) Calculate the volume-weighted average of VOC emissions to the atmosphere (N) during each calendar month by the following equation:

$$N = G(1 - R)$$

(iv) If the volume-weighted average mass of VOC's emitted to the atmosphere for each calendar month (N) is less than or equal to 0.90 kilogram per liter of coating solids applied, the affected facility is in compliance. Each monthly calculation is a performance test.

(3) An owner or operator shall use the following procedures for any affected facility which uses a control device that recovers the VOC's (e.g., carbon adsorber) to comply with the applicable emission limit specified under Rule 260.312.

(i) Calculate the total mass of VOC's consumed ($M_o + M_d$) and the volume-weighted average of the total mass of VOC's per unit volume of coating solids applied (G) during each calendar month for each affected facility using equations in Subsection (c)(1)(i)(A), (B), and (C) of this rule.

(ii) Calculate the total mass of VOC's recovered (M_r) during each calendar month using the following equation:

$$M_r = L_r D_r$$

(iii) Calculate overall reduction efficiency of the control device (R) for each calendar month for each affected facility using the following equation:

$$R = \frac{M_r}{M_o + M_d}$$

(iv) Calculate the volume-weighted average mass of VOC's emitted to the atmosphere (N) for each calendar month for each affected facility using equation in Subsection (c)(2)(iii) of this rule.

(v) If the weighted average mass of VOC's emitted to the atmosphere for each calendar month (N) is less than or equal to 0.90 kilogram per liter of coating solids applied, the affected facility is in compliance. Each monthly calculation is a performance test.

RULE 260.314. MONITORING OF EMISSIONS AND OPERATIONS

(a) The owner or operator of an affected facility which uses a capture system and an incinerator to comply with the emission limits specified under Rule 260.312 shall install, calibrate, maintain, and operate temperature measurement devices according to the following procedures:

(1) Where thermal incineration is used, a temperature measurement device shall be installed in the firebox. Where catalytic incineration is used, a temperature measurement device shall be installed in the gas stream immediately before and after the catalyst bed.

(2) Each temperature measurement device shall be installed, calibrated, and maintained according to the manufacturer's specifications. The device shall have an accuracy of the greater of 0.75 percent of the temperature being measured expressed in degrees Celsius or ±2.5˚C.

(3) Each temperature measurement device shall be equipped with a recording device so that a permanent continuous record is produced.

(b) The owner or operator of an affected facility which uses a capture system and a solvent recovery system to comply with the emission limits specified under Rule 260.312 shall install the equipment necessary to determine the total volume of VOC-solvent recovered daily.

RULE 260.315. REPORTING AND RECORDKEEPING REQUIREMENTS

(Rev. Effective 11-3-92)

(a) The reporting requirements of Rule 260.8(a) apply only to the initial performance test. Each owner or operator subject to the provisions of this subpart shall include the following data in the report of the initial performance test required under Rule 260.8(a):

(1) Except as provided in Subsection (a)(2) of this rule the volume-weighted average mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) for a period of one calendar month from each affected facility.

(2) For each affected facility where compliance is determined under the provisions of Rule 260.313(c)(1)(iv), a list of the coatings used during a period of one calendar month, the VOC content of each coating calculated from data determined using Reference Method 24 or supplied by the manufacturer of the coating, and minimum transfer efficiency of any coating application equipment used during the month.

(3) For each affected facility where compliance is achieved through the use of an incineration system, the following additional information will be reported:

(i) The proportion of total VOC's emitted that enters the control device (F),

(ii) The VOC reduction efficiency of the control device (E),

(iii) The average combustion temperature (or the average temperature upstream and downstream of the catalyst bed), and

(iv) A description of the method used to establish the amount of VOC's captured and sent to the incinerator.

(4) For each affected facility where compliance is achieved through the use of a solvent recovery system, the following additional information will be reported:

(i) The volume of VOC-solvent recovered (L_r), and

(ii) The overall VOC emission reduction achieved (R).

(b) Following the initial performance test, the owner or operator of an affected facility shall identify, record, and submit a written report, as specified in Rule 260.7(c), to the Control Officer every calendar quarter of each instance in which the volume-weighted average of the

total mass of VOC's emitted to the atmosphere per volume of applied coating solids (N) is greater than the limit specified under Rule 260.312. If no such instances have occurred during a particular quarter, a report stating this shall be submitted to the Control Officer semiannually.

(c) Following the initial performance test, the owner or operator of an affected facility shall identify, record, and report semiannually to the Control Officer the following:

(1) Where compliance with Rule 260.312 is achieved through the use of thermal incineration, each 3-hour period when metal furniture is being coated during which the average temperature of the device was more than 28°C below the average temperature of the device during the most recent performance test at which destruction efficiency was determined as specified under Rule 260.313.

(2) Where compliance with Rule 260.312 is achieved through the use of catalytic incineration, each 3-hour period when metal furniture is being coated during which the average temperature of the device immediately before the catalyst bed is more than 28°C below the average temperature of the device immediately before the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under Rule 260.313.

Additionally, when metal furniture is being coated, all 3-hour periods during which the average temperature difference across the catalyst bed is less than 80 percent of the average temperature difference across the catalyst bed during the most recent performance test at which destruction efficiency was determined as specified under Rule 260.313 will be recorded.

(3) For thermal and catalytic incinerators, if no such periods as described in Subsections (c)(1) and (c)(2) of this rule occur, the owner or operator shall state this in the report.

(d) Each owner or operator subject to the provisions of this subpart shall maintain at the source, for a period of at least 2 years, records of all data and calculations used to determine VOC emissions from each affected facility. Where compliance is achieved through the use of thermal incineration, each owner or operator shall maintain, at the source, daily records of the incinerator combustion chamber temperature. If catalytic incineration is used, the owner or operator shall maintain at the source daily records of the gas temperature, both upstream and downstream of the incinerator catalyst bed. Where compliance is achieved through the use of a solvent recovery system, the owner or operator shall maintain at the source daily records of the amount of solvent recovered by the system for each affected facility.

RULE 260.316. TEST METHODS AND PROCEDURES

Performance tests shall be conducted as specified in Part 60, Chapter I, Title 40, Code of Federal Regulations, Section 60.316.