§ 2105.77 CONTROL OF VOC EMISSIONS FROM LARGE APPLIANCE AND METAL FURNITURE SURFACE COATING PROCESSES

a. **Applicability.** Beginning January 1, 2011, this section applies to the owner or operator of a large appliance or metal furniture surface coating process, where the total actual VOC emissions from all large appliance or metal furniture surface coating operations, including related cleaning activities, at that facility are equal to or greater than 15 pounds (6.8 kilograms) per day or 2.7 tons (2,455 kilograms) per twelve month rolling period. The limits from § 2105.10 and Table § 2105.10 no longer apply to the large appliance and metal furniture surface coating process as of January 1, 2011.

b. **Limitations.** A person may not cause or permit the emission into the outdoor atmosphere of VOCs from a large appliance or metal furniture surface coating process unless one of the following limitations is met:

1. The VOC content of each as applied coating is equal to or less than the standard specified in Table 2105.77.

A. The VOC content of the as applied coating, expressed in units of weight of VOC per volume of coating solids, shall be calculated as follows:

$VOC = (W_o)(D_c)/(V_n)$

Where:

VOC = VOC content in lb VOC/gal of coating solids
$W_{o=}$ Weight percent of VOC (W_v-W_w-W_{ex})
W_v= Weight percent of total volatiles (100%-weight percent solids)
W_w= Weight percent of water
W_{ex} = Weight percent of exempt solvent(s)
D_c = Density of coating, lb/gal, at 25°C
V_n = Volume percent of solids of the as applied coating

B. The VOC content of a dip coating, expressed in units of weight of VOC per volume of coating solids, shall be calculated on a 30-day rolling average basis using the following equation:

$$VOC_A = \frac{\sum_i (W_{oi} \times D_{ci} \times Q_i + \sum_J (W_{oJ} \times D_{dJ} \times Q_J)}{\sum_i (V_{ni} \times Q_i)}$$

Where:

VOC_A = VOC content in lb VOC/gal of coating solids for a dip coating, calculated on a 30-day rolling average basis
W_{oi} = Percent VOC by weight of each as supplied coating (i) added to the dip coating process, expressed as a decimal fraction (that is 55% = 0.55)

D_{ci} = Density of each as supplied coating (i) added to the dip coating process, in pounds per gallon
Q_i = Quantity of each as supplied coating (i) added to the dip coating process, in gallons
V_{ni} = Percent solids by volume of each as supplied coating (i) added to the dip coating process, expressed as a decimal fraction
W_{oJ} = Percent VOC by weight of each thinner (J) added to the dip coating process, expressed as a decimal fraction
D_{dJ} = Density of each thinner (J) added to the dip coating process, in pounds per gallon
Q_J = Quantity of each thinner (J) added to the dip coating process, in gallons

C. The VOC content limits of subparagraphs A and B may be met by averaging the VOC content of materials used on a single surface coating process line each day (i.e., daily within-coating unit averaging).

D. Sampling and testing shall be done in accordance with the procedures and test methods specified in Part G (Methods).

2. The overall weight of VOCs emitted to the atmosphere is reduced through the use of vapor recovery or incineration or another method which is acceptable under § 2105.01 (Equivalent Compliance Techniques). The overall efficiency of a control system, as determined by the test methods and procedures specified in Part G, shall be no less than 90% as calculated by the following equation:

$$\mathbf{90\% = (1 - E/V) \times 100}$$

Where:

V = The VOC content of the as applied coating, in lb VOC/gal of coating solids
E = The Table 2105.77 limit for large appliances and metal furniture surface coatings in lbs VOC per gallon of coating solids

3. A combination of the methods listed in paragraphs 1 and 2.

c. **Records.** A facility, regardless of the facility's annual emission rate, which contains large appliance or metal furniture surface coating processes, shall maintain records sufficient to demonstrate compliance with this section. At a minimum, a facility shall maintain daily records of:

1. The following parameters for each coating, thinner and other component as supplied:

A. The coating, thinner or component name and identification number;
B. The volume used;
C. The mix ratio;
D. The density or specific gravity;
E. The weight percent of total volatiles, water, solids and exempt solvents;

F. The volume percent of solids, Table 2105.77 for large appliances or metal furniture, for each coating used in the surface coating process.

2. The VOC content of each coating, thinner and other component as supplied.

3. The VOC content of each as applied coating.

The records shall be maintained for 2 years and shall be submitted to the Department on a schedule reasonably prescribed by the Department.

d. **Exempt Solvents.** The solvents methyl chloroform (1,1,1-trichioroethane) and methylene chloride are exempt from control under this Section. No large appliance or metal furniture surface coating process which seeks to comply with this Section through the use of an exempt solvent may be included in any alternative standard approved pursuant to this Article.

e. **Application Techniques.** A person may not cause or permit the emission into the outdoor atmosphere of VOCs from the application of large appliance or metal furniture surface coatings unless the coatings are applied using one or more of the following coating application methods:

1. Electrostatic spraying;
2. Roller coating;
3. Flow coating;
4. Dip coating, including electrodeposition;
5. High volume-low pressure (HVLP) spraying;
6. Brush coating;
7. Other coating application method that the person demonstrates and the Department determines achieves emission reductions equivalent to HVLP or electrostatic spray application methods.

f. **Emission Limitations.** If more than one emission limitation in Table 2105.77 for large appliances or metal furniture applies to a specific coating, the least stringent emission limitation applies.

g. **Exempt Other.** The VOC coating content standards in Table 2105.77 for large appliances or metal furniture do not apply to a coating used exclusively for stencil coatings, safety-indicating coatings, solid-film lubricants, electric-insulating coatings, thermal-conducting coatings, touch-up and repair coatings, coating applications using hand-held aerosol cans, coatings used exclusively for determining product quality and commercial acceptance, and other small quantity coatings if the coating meets the following criteria:

1. The quantity of coating used does not exceed 50 gallons per year for a single coating and a total of 200 gallons per year for all coatings combined for the facility.

2. The owner or operator of the facility requests, in writing, and the Department approves, in writing, the exemption prior to use of the coating.

h. **Housekeeping.** The following work practices for coating-related activities and cleaning materials apply to the owner or operator of a large appliance or metal furniture surface coating process:

1. Store all VOC-containing coatings, thinners, coating—related waste materials, cleaning materials and used shop towels in closed containers.

2. Ensure that mixing and storage containers used for VOC-containing coatings, thinners, coating-related waste materials and cleaning materials are kept closed at all times except when depositing or removing these materials.

3. Minimize spills of VOC-containing coatings, thinners, coating—related waste materials and cleaning materials, cleaning up spills immediately.

4. Convey VOC-containing coatings, thinners, coating—related waste materials and cleaning materials from one location to another in closed containers or pipes.

5. Minimize VOC emissions from cleaning of storage, mixing and conveying equipment.

Table 2105.77
Emission Limits of VOCs for Large Appliance and Metal Furniture Surface Coatings

Weight of VOC per Volume of Coating Solids

	Baked		Air Dried	
Surface Coating Process Category	kg/l	lb/gal	kg/l	lb/gal
Large Appliance coating				
(a) general, one component	0.40	3.3	0.40	3.3
(b) general, multi-component	0.40	3.3	0.55	4.5
(c) extreme high gloss	0.55	4.62	0.55	4.5
(d) extreme performance	0.55	4.62	0.55	4.62
(e) heat resistant	0.55	4.62	0.55	4.62
(f) metallic	0.55	4.62	0.55	4.62
(g) pretreatment coatings	0.55	4.62	0.55	4.62
(h) solar absorbent	0.55	4.62	0.55	4.62
2. Metal Furniture coating				
(a) general, one component	0.40	3.3	0.40	3.3
(b) general, multi-component	0.40	3.3	0.55	4.5
(c) extreme high gloss	0.61	5.06	0.55	4.5
(d) extreme performance	0.61	5.06	0.61	5.06
(e) heat resistant	0.61	5.06	0.61	5.06
(f) metallic	0.61	5.06	0.61	5.06
(g) pretreatment coatings	0.61	5.06	0.61	5.06
(h) solar absorbent	0.61	5.06	0.61	5.06

§ 2105.78 CONTROL OF VOC EMISSIONS FROM FLAT WOOD PANELING COATING PROCESSES

a. **Applicability.** Beginning January 1, 2011, this section applies to the owner or operator of a flat wood paneling coating process, where the total actual VOC emissions from all flat wood panel surface coating operations, including related cleaning activities, at the facility are equal to or greater than 15 pounds (6.8 kilograms) per day or 2.7 tons (2,455 kilograms) per twelve month rolling period.

b. **Limitations.** A person may not cause or permit the emission into the outdoor atmosphere of VOCs from a flat wood paneling coating process, unless one of the following limitations is met:

1. The VOC content of each as applied coating is equal to or less than 2.9 lbs VOC per gallon of coating solids (0.35 kg VOC per liter of coating solids).

A. The VOC content of each as applied coating, expressed in units of weight of VOC per volume of coating solids, shall be calculated as follows:

$$\mathbf{VOC = (W_o)(D_c)/V_n}$$

Where:
VOC = VOC content in lb VOC/gal of coating solids
W_o = Weight percent of VOC (W_v-W_w-W_{ex})
W_v = Weight percent of total volatiles (100%-weight percent solids)
W_w = Weight percent of water
W_{ex} = Weight percent of exempt solvent(s)
D_c = Density of coating, lb/gal, at 25°C
V_n = Volume percent of solids of the as applied coating

B. The VOC content of a dip coating, expressed in units of weight of VOC per volume of coating solids, shall be calculated on a 30-day rolling average basis using the following equation:

$$VOC_A = \frac{\sum_i (W_{oi} \times D_{ci} \times Q_i + \sum_J (W_{oJ} \times D_{dJ} \times Q_J)}{\sum_i (V_{ni} \times Q_i)}$$

Where:

VOC_A = VOC content in lb VOC/gal of coating solids for a dip coating, calculated on a 30-day rolling average basis
W_{oi} = Percent VOC by weight of each as supplied coating (i) added to the dip coating process, expressed as a decimal fraction (that is 55% = 0.55)
D_{ci} = Density of each as supplied coating (i) added to the dip coating process, in pounds per gallon
Q_i = Quantity of each as supplied coating (i) added to the dip coating process, in gallons

V_{ni} = Percent solids by volume of each as supplied coating (i) added to the dip coating process, expressed as a decimal fraction
W_{oJ} = Percent VOC by weight of each thinner (J) added to the dip coating process, expressed as a decimal fraction
D_{dJ} = Density of each thinner (J) added to the dip coating process, in pounds per gallon
Q_J = Quantity of each thinner (J) added to the dip coating process, in gallons

C. The VOC content limits of subparagraphs A and B may be met by averaging the VOC content of materials used on a single surface coating process line each day (i.e., daily within-coating unit averaging).

D. Sampling and testing shall be done in accordance with the procedures and test methods specified in Part G (Methods).

2. The overall weight of VOCs emitted to the atmosphere is reduced through the use of vapor recovery or incineration or another method which is acceptable under § 2105.01 (Equivalent Compliance Techniques). The overall efficiency of a control system, as determined by the test methods and procedures specified in Part G, shall be no less than 90% as calculated by the following equation:

90% = (1 - E/V) x 100

Where:
V = The VOC content of the as applied coating, in lb VOC/gal of coating solids
E = Limit of 2.9 lbs VOC per gallon of coating solids (0.35 kg VOC per liter of coating solids)

3. A combination of the methods listed in paragraphs 1 and 2.

c**. Records**. A facility, regardless of the facility's annual emission rate, which contains flat wood paneling coating processes, shall maintain records sufficient to demonstrate compliance with this section. At a minimum, a facility shall maintain daily records of:

1. The following parameters for each coating, thinner, and other component as supplied:

A. The coating, thinner or component name and identification number;
B. The volume used;
C. The mix ratio;
D. The density or specific gravity;
E. The weight percent of total volatiles, water, solids and exempt solvents.
F. The volume percent of solids for each coating used in the flat wood paneling coating process.

2. The VOC content of each coating, thinner and other component as supplied.

3. The VOC content of each as applied coating.

The records shall be maintained for 2 years and shall be submitted to the Department on a schedule reasonably prescribed by the Department.

d. **Exempt Solvents**. The solvents methyl chloroform (l,1,l-trichloroethane) and methylene chloride are exempt from control under this Section. No flat wood paneling coating process which seeks to comply with this Section through the use of an exempt solvent may be included in any alternative standard approved pursuant to this Article.

e. **Application Techniques.** A person may not cause or permit the emission into the outdoor atmosphere of VOCs from the flat wood paneling coatings unless the coatings are applied using one or more of the following coating application methods:

1. Electrostatic spraying;
2. Airless coating;
3. Curtain coating;
4. Roller coating;
5. Flow coating;
6. Dip coating, including electrodeposition;
7. High volume-low pressure (HVLP) spraying;
8. Hand brush or roller coat;
9. Other coating application method that the person demonstrates and the Department determines achieves emission reductions equivalent to HVLP or electrostatic spray application methods.

f**. Exempt Other.** The VOC coating content standard of 2.9 lbs VOC per gallon of coating solids (0.35 kg VOC per liter of coating solids) do not apply to a coating used exclusively for stencil coatings, touch-up and repair coatings, coating applications using hand-held aerosol cans, air atomized sprays that apply cosmetic specialty coatings, if the volume of the cosmetic specialty coatings is less than 5% by volume of the total coating used at the source or to apply finial repair coatings, coatings used exclusively for determining product quality and commercial acceptance and other small quantity coatings if the coating meets the following criteria:

1. The quantity of coating used does not exceed 50 gallons per year for a single coating and a total of 200 gallons per year for all coatings combined for the facility.

2. The owner or operator of the facility requests, in writing, and the Department approves, in writing, the exemption prior to use of the coating.

g. **Housekeeping**. The following work practices for coating-related activities and cleaning materials apply to the owner or operator of a flat wood paneling coating process:

1. Store all VOC-containing coatings, thinners, coating—related waste materials, cleaning materials and used shop towels in closed containers.

2. Ensure that mixing and storage containers used for VOC-containing coatings, thinners, coating-related waste materials and cleaning materials are kept closed at all times except when depositing or removing these materials.

3. Minimize spills of VOC-containing coatings, thinners and coating—related waste materials and cleaning materials, cleaning up spills immediately.

4. Convey VOC-containing coatings, thinners, coating—related waste materials and cleaning materials from one location to another in closed containers or pipes.

5. Minimize VOC emissions during cleaning of storage, mixing, and conveying equipment.

§ 2105.79 CONTROL OF VOC EMISSIONS FROM PAPER, FILM, AND FOIL SURFACE COATING PROCESSES

a. **Applicability.** Beginning January 1, 2011, this section applies to the owner or operator of a paper, film, and foil surface coating process, where the total actual VOC emissions from all paper, film, and foil surface coating operations, including related cleaning activities, at that facility are equal to or greater than 15 pounds (6.8 kilograms) per day or 2.7 tons (2,455 kilograms) per twelve month rolling period. The limits from § 2105.10 and Table § 2105.10 no longer apply to the paper, film, and foil surface coating process as of January 1, 2011.

b**. Limitations.** A person may not cause or permit the emission into the outdoor atmosphere of VOCs from a paper, film, and foil surface coating process unless one of the following limitations is met:

1. The VOC content of each as applied coating is equal to or less than the standard specified in Table 2105.79.

A. The VOC content of the as applied coating, expressed in units of weight of VOC per weight of coating solids, shall be calculated as follows:

$$\mathbf{VOC_B = (W_o)/(W_n)}$$

Where:

VOC_B = VOC content in lb VOC/lb of coating solids
W_o = Weight percent of VOC (W_v-W_w-W_{ex})
W_v = Weight percent of total volatiles (100%-weight percent solids)
W_w = Weight percent of water
W_{ex} = Weight percent of exempt solvents
W_n = Weight percent of solids of the as applied coating

B. The VOC content of a dip coating, expressed in units of weight of VOC per weight of coating solids, shall be calculated on a 30-day rolling average basis using the following equation:

$$VOC_A = \frac{\sum_i (W_{oi} \times D_{ci} \times Q_i + \sum_J (W_{oJ} \times D_{dJ} \times Q_J)}{\sum_i (W_{ni} \times D_{ci} \times Q_i)}$$

Where:

VOC_A = VOC content in lb VOC/gal of coating solids for a dip coating, calculated on a 30-day rolling average basis
W_{oi} = Percent VOC by weight of each as supplied coating (i) added to the dip coating process, expressed as a decimal fraction (that is 55% = 0.55)
D_{ci} = Density of each as supplied coating (i) added to the dip coating process, in pounds per gallon
Q_i = Quantity of each as supplied coating (i) added to the dip coating process, in gallons
W_{ni} = Percent solids by volume of each as supplied coating (i) added to the dip coating process, expressed as a decimal fraction
W_{oJ} = Percent VOC by weight of each thinner (J) added to the dip coating process, expressed as a decimal fraction
D_{dJ} = Density of each thinner (J) added to the dip coating process, in pounds per gallon
Q_J = Quantity of each thinner (J) added to the dip coating process, in gallons

C. The VOC content limits of subparagraphs A and B may be met by averaging the VOC content of materials used on a single surface coating process line each day (i.e., daily within-coating unit averaging).

D. Sampling and testing shall be done in accordance with the procedures and test methods specified in Part G (Methods).

2. The overall weight of VOCs emitted to the atmosphere is reduced through the use of vapor recovery or incineration or another method which is acceptable under § 2105.01 (Equivalent Compliance Techniques). The overall efficiency of a control system, as determined by the test methods and procedures specified in Part G, shall be no less than 90% as calculated by the following equation:

$$\mathbf{90\% = (1 - E/V) \times 100}$$

Where:

V = The VOC content of the as applied coating, in lb VOC/lb of coating solids
E = The Table 2105.79 limit for paper, film, and foil surface coating in lbs VOC per lbs of coating solids

3. A combination of the methods listed in paragraphs 1 and 2.

c. **Records.** A facility, regardless of the facility's annual emission rate, which contains paper, film, and foil surface coating processes, shall maintain records sufficient to

demonstrate compliance with this section. At a minimum, a facility shall maintain daily records of:

1. The following parameters for each coating, thinner and other component as supplied:

A. The coating, thinner or component name and identification number;
B. The volume used;
C. The mix ratio;
D. The density or specific gravity;
E. The weight percent of total volatiles, water, solids and exempt solvents;
F. The volume percent of solids, Table 2105.79 for paper, film, and foil, for each coating used in the surface coating process..

2. The VOC content of each coating, thinner and other component as supplied.

3. The VOC content of each as applied coating.

The records shall be maintained for 2 years and shall be submitted to the Department on a schedule reasonably prescribed by the Department.

d**. Exempt Solvents.** The solvents methyl chloroform (1,1,1 -trichloroethane) and methylene chloride are exempt from control under this Section. No paper, film, and foil surface coating process which seeks to comply with this Section through the use of an exempt solvent may be included in any alternative standard approved pursuant to this Article.

e. **Application Techniques.** A person may not cause or permit the emission into the outdoor atmosphere of VOCs from the application of paper, film, and foil surface coatings unless the coatings are applied using one or more of the following coating application methods:

1. Rotogravure (web-fed gravure).
2. Reverse roll coating.
3. Slot die coating.
4. Knife coating.
5. Flexographic coating.
6. Mayer rod or wire-wound rod coating.
7. Dip and squeeze coating.
8. Extrusion coating, including calendaring

f. **Emission Limitations**. If more than one emission limitation in Table 2105.79 for paper, film, and foil surface coating applies to a specific coating, the least stringent emission limitation applies.

g. **Exempt Other.** The VOC coating content standards in Table 2105.79 for paper, film, and foil surface coatings do not apply to a coating used exclusively stencil coatings, touch-up and repair coatings, coating applications using hand-held aerosol cans, coatings used exclusively for determining product quality and commercial acceptance and other small quantity coatings if the coating meets the following criteria:

1. The quantity of coating used does not exceed 50 gallons per year for a single coating and a total of 200 gallons per year for all coatings combined for the facility.

2. The owner or operator of the facility requests, in writing, and the Department approves, in writing, the exemption prior to use of the coating.

h. **Housekeeping.** The following work practices for coating-related activities and cleaning materials apply to the owner or operator of a paper, film, and foil surface coating process:

1. Store all VOC-containing coatings, thinners, coating—related waste materials, cleaning materials and used shop towels in closed containers.

2. Ensure that mixing and storage containers used for VOC-containing coatings, thinners, coating-related waste materials and cleaning materials are kept closed at all times except when depositing or removing these materials.

3. Minimize spills of VOC-containing coatings, thinners, coating—related waste materials and cleaning materials, cleaning up spills immediately.

4. Convey VOC-containing coatings, thinners, coating—related waste materials and cleaning materials from one location to another in closed containers or pipes.

5. Minimize VOC emissions from cleaning of storage, mixing and conveying equipment.

Table 2105.79
Emission Limits of VOCs for Paper, Film, and Foil Surface Coatings

	Weight of VOC per Weight of Solids or Coating Applied	
Surface Coating Process Category	Solids Applied kg VOC/kg solids (lb VOC/lb solids)	Coating Applied kg VOC/kg coatings (lb VOC/lb coatings)
1. Pressure Sensitive Tape and Label	0.20	0.067
2. Paper, Film, and Foil (Not including Pressure Sensitive Tape and Label)	0.40	0.08

[Sections 2105.77, 2105.78, and 2105.79 are added; the SIP effective date is February 28, 2011.]