



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

2008 Area Source Emissions Inventory Methodology

230 – INDUSTRIAL COATINGS AND RELATED SOLVENTS

I. Purpose

This document describes the Area Source Methodology used to estimate emissions of volatile organic compounds (VOC) from industrial surface coating operations of plastic parts, semiconductors, and aircraft and aerospace parts in the San Joaquin Valley Air Basin. An area source category is a collection of similar emission units within a geographic area (i.e., a County) that are small and numerous and may not have been inventoried as a specific point, mobile or biogenic sources. The California Air Resources Board (CARB) has grouped these individual sources with other like sources into area source categories. These source categories are grouped in such a way that they can be estimated collectively using one methodology.

II. Applicability

The emission calculations from this Area Source Methodology apply to facilities that are identified by the following Category of Emission Source (CES) codes and Reconciliation Emission Inventory Codes (REIC):

Table 1. Emission inventory codes.

CES	REIC	Description
87650	230-236-9000-0000	Plastic Parts Coatings
87668	230-237-9000-0000	Semiconductor Coatings
87676	230-238-9000-0000	Aircraft and Aerospace Coatings

III. Point Source Reconciliation

Emissions from the area source inventory and point source inventory are reconciled against each other to prevent double counting. This is done using relationships created by the California Air Resources Board (CARB) between the area source REIC and the point sources' Standard Industry Classification (SIC) code and emissions process Source Category Code (SCC) combinations. Currently, this source does not reconcile to any processes within our point source inventory.

IV. Methodology Description

This area source methodology is used to estimate emissions of volatile organic compounds from plastic parts, semiconductor, and aircraft and aerospace surface coating operations. Although all surface coating operations within the District are subject to permit and are included in our point source inventory, none are reconciled by CARB to the source categories in this methodology. Following is a listing of Source Classification Codes that the District would expect to reconcile to the area source categories estimated by this methodology:

Plastic Parts Coatings.

- SCC 40202201 (Surface Coating - Plastic Parts - Coating Operation)
- SCC 40202203 (Surface Coating - Plastic Parts - Coating Mixing)
- SCC 40202211 (Surface Coating - Plastic Parts - Wb Coating)
- SCC 40202213 (Surface Coating - Plastic Parts - Hi Solids Sb Emi/Rfi)
- SCC 40202220 (Surface Coating - Plastic Parts - Prime Coat Applications)
- SCC 40202240 (Surface Coating - Plastic Parts - Top/Texture Coat App)
- SCC 40202280 (Surface Coating - Plastic Parts - Maskant Application)
- SCC 40202299 (Surface Coating - Plastic Parts – Other)

Semiconductor Coatings.

- SCC 40202701 (Surface Coating - Semiconductors - Specify Solvents)

Aircraft and Aerospace Coatings.

- SCC 40202401 (Surface Coating - Large Aircraft - Prime Coat Operations)
- SCC 40202403 (Surface Coating - Large Aircraft - Coating Mixing)
- SCC 40202404 (Surface Coating - Large Aircraft - Coating Storage)
- SCC 40202406 (Surface Coating - Large Aircraft - Topcoat Operation)
- SCC 40202499 (Surface Coating - Large Aircraft – Other)

Instead, the above Source Classification Codes reconcile to the *Unspecified Industrial Coating* area source category (REIC 230-995-9000-0000). CARB estimates a statewide area source emissions inventory for this REIC using national paint production data from the 1982 *Census of Manufacturers, Paint and Allied Products*. To prevent double counting, the District will not estimate area source emissions from plastic parts, semiconductor and aircraft and aerospace coatings since their emissions are already estimated in the *Unspecified Industrial Coating* source category.

V. Activity Data

Not applicable.

VI. Emission Factors

Not applicable.

VII. Emissions Calculations

A. Assumptions

Not applicable.

B. Sample Calculations

Not applicable.

VIII. Temporal Variation

Not applicable.

IX. Spatial Variation

Not applicable.

X. Growth Factor

Not applicable.

XI. Control Level

Not applicable.

XII. CARB Chemical Speciation

CARB has developed organic gas profiles in order to calculate reactive organic gasses (ROG), volatile organic compounds (VOC) or total organic gas (TOG) given any one of the three values. For each speciation profile, the fraction of TOG that is ROG and VOC is given. The organic gas profile codes can also be used to lookup associated toxics. CARB's speciation profile for industrial coating operations is presented in the table below. Organic gas profile #783 is applied to REIC 230-236-9000-0000 (plastic parts), 230-237-9000-0000 (semiconductors), and 230-238-9000-0000 (aircraft and aerospace) as shown in the table below.

Table 2. CARB organic gas speciation profiles for 230-236-9000-0000, 230-237-9000-0000 and 230-238-9000-0000.

Profile Description	CARB Organic Gas Profile#	Fractions	
		ROG	VOC
Industrial Surface Coating – Solvent Based Paint	783	0.988	0.988

CARB has developed particulate matter speciation profiles in order to calculate particulate matter (PM), particulate matter with a diameter less than or equal to 10 microns (PM_{10}) or particulate matter with a diameter less than or equal to 2.5 microns ($PM_{2.5}$) given any one of the three values. For each speciation profile, the fraction of PM that is PM_{10} and $PM_{2.5}$ is given. The particulate matter profile codes can also be used to lookup associated toxics. CARB's speciation profile for industrial coating operations is presented in the table below. Particulate matter profile #220 is applied to REIC 230-236-9000-0000 (plastic parts), 230-237-9000-0000 (semiconductors), and 230-238-9000-0000 (aircraft and aerospace) as shown in the table below.

Table 3. CARB particulate matter speciation profiles for 230-236-9000-0000, 230-237-9000-0000 and 230-238-9000-0000.

Profile Description	CARB PM Profile#	Fractions	
		PM_{10}	$PM_{2.5}$
Coating Material Evaporation	220	0.96	0.925

XIII. Assessment Of Methodology

These source categories are not currently being used by District since their emissions are being estimated in REIC 230-995-9000-0000 (*Unspecified Industrial Coatings*)

XIV. Emissions

Following is the 2008 area source emissions inventory for REICs 230-236-9000-0000, 230-237-9000-0000, and 230-238-9000-0000. Emissions are reported for each county in the District.

Table 4. Area source emissions for plastic parts, semiconductor, and aircraft and aerospace coatings (2008).

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC ⁽¹⁾	PM ₁₀	PM _{2.5} ⁽¹⁾
PLASTIC PARTS COATINGS (REIC 230-236-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
SEMICONDUCTOR COATINGS (REIC 230-237-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
AEROSPACE AND AIRCRAFT COATINGS (REIC 230-238-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM_{2.5} emissions. PM_{2.5} emissions can be estimated using the speciation profiles found in Section XII.

230 – Industrial Coatings and Related Solvents

Following is the 2008 point source emissions inventory for REICs 230-236-9000-0000, 230-237-9000-0000, and 230-238-9000-0000. Emissions are reported for each county in the District.

Table 5. Point source emissions for plastic parts, semiconductor, and aircraft and aerospace coatings (2008).

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC ⁽¹⁾	PM ₁₀	PM _{2.5} ⁽¹⁾
PLASTIC PARTS COATINGS (REIC 230-236-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
SEMICONDUCTOR COATINGS (REIC 230-237-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
AEROSPACE AND AIRCRAFT COATINGS (REIC 230-238-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM_{2.5} emissions. PM_{2.5} emissions can be estimated using the speciation profiles found in Section XII.

230 – Industrial Coatings and Related Solvents

Following is the 2008 total unreconciled emissions for REICs 230-236-9000-0000, 230-237-9000-0000, and 230-238-9000-0000. Emissions are reported for each county in the District.

Table 6. Total unreconciled emissions for plastic parts, semiconductor, and aircraft and aerospace coatings (2008).

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC ⁽¹⁾	PM ₁₀	PM _{2.5} ⁽¹⁾
PLASTIC PARTS COATINGS (REIC 230-236-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
SEMICONDUCTOR COATINGS (REIC 230-237-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
AEROSPACE AND AIRCRAFT COATINGS (REIC 230-238-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A

- (1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.
- (2) At this time, the District does not calculate PM_{2.5} emissions. PM_{2.5} emissions can be estimated using the speciation profiles found in Section XII.

Following is the net change in total emissions between this update (2008 inventory year) and the previous emissions year (2007 inventory year) for REICs 230-236-9000-0000, 230-237-9000-0000, and 230-238-9000-0000. The change in emissions is reported for each county in the District.

Table 7. Net change in total emissions for plastic parts, semiconductor, and aircraft and aerospace coatings (2008-2007).

County	Emissions (tons/year)					
	NOx	CO	SOx	VOC ⁽¹⁾	PM ₁₀	PM _{2.5} ⁽¹⁾
PLASTIC PARTS COATINGS (REIC 230-236-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
SEMICONDUCTOR COATINGS (REIC 230-237-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A
AEROSPACE AND AIRCRAFT COATINGS (REIC 230-238-9000-0000)						
Fresno	-	-	-	0.00	-	N/A
Kern	-	-	-	0.00	-	N/A
Kings	-	-	-	0.00	-	N/A
Madera	-	-	-	0.00	-	N/A
Merced	-	-	-	0.00	-	N/A
San Joaquin	-	-	-	0.00	-	N/A
Stanislaus	-	-	-	0.00	-	N/A
Tulare	-	-	-	0.00	-	N/A
TOTAL	-	-	-	0.00	-	N/A

(1) The District only reports ROG to CARB. As noted in Section XII, ROG is the same as VOC.

(2) At this time, the District does not calculate PM_{2.5} emissions. PM_{2.5} emissions can be estimated using the speciation profiles found in Section XII.

XV. Revision History

2009. This is a new District methodology

XVI. Update Schedule

In an effort to provide inventory information to CARB and other District programs and maximize limited resources, the District has developed an update cycle based on emissions within the source category as shown in the following table:

Table 7. Area source update frequency criteria.

Total Emissions (tons/day)	Update Cycle (years)
<=1	4
>1 and <= 2.5	3
>2.5 and <=5	2
>5	1

Emissions from the plastic parts, semiconductor, and aircraft and aerospace coatings source categories are currently being estimated in the *Unspecified Industrial Surface Coating* source category. This methodology will be re-evaluated in four years.

XVII. References

1. ARB Emission Inventory Procedural Manual, Methods for Assessing Area Source Emissions, Coatings and Related Process Solvents Industrial Coatings, Section 3.5, Volume III, Revised October 1997.
<<http://www.arb.ca.gov/ei/areasrc/fullpdf/full3-5.pdf>>