



South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

GUIDELINES FOR PARTICULATE MATTER (PM) EMISSION CALCULATIONS FOR SPRAY COATING OPERATIONS

The following methodology can be used to calculate PM emissions factor from spray coating operations reported on Form B4/B4U:

$$EF_{PM} = S \times (1 - TE) \times (1 - CE)$$

where: EF_{PM} = Emissions Factor of PM (lbs)
S ⁽¹⁾ = Solid content (lb/gal or lb/lb) in coatings
TE ⁽²⁾ = Transfer Efficiency (decimal)
CE ⁽³⁾ = Control System Efficiency (decimal)

- (1) User may refer to the product Material Safety Data Sheets (MSDS) or Product Data Sheet to determine the solid content (S) of a coating. This content can be either in terms of percentage (weight fraction or lb/lb) or factor (lb/gal). In the absence of any coating specific data, the following default factors can be used for calculation purposes.

SOLID PERCENTAGE: 37.5 % or 0.375 lb/lb or SOLID FACTOR: 3.0 lb/gal

NOTE: Unit of S must be consistent with that of annual usage of coatings applied, i.e., S in weight fraction or lb/lb for annual use reported in pounds and S in lb/gal for annual use reported in gallons.

- (2) User may refer to the Equipment Technical Specification Data to determine the transfer efficiency (TE) of coating equipment. In the absence of any specific equipment technical data, use the default TE = 0.65.

NOTE: Other coating operations include flow, roller, and dip coating and do not result in PM emissions.

- (3) If coating is performed inside a spray booth which is equipped with a filter system to control PM emissions, the following control efficiency (CE) can be used depending on the type of filter:

CONVENTIONAL FILTERS: CE = 0.90 or

3-STAGE AEROSPACE NESHAP-COMPLIANT FILTERS: CE = 0.95 or

HIGH EFFICIENCY PARTICLE ARRESTOR (HEPA): CE = 0.9997*

*The HEPA filters used shall be individually dioctyl phthalate [DOP] tested with 0.3 micron particles and certified to have an efficiency of not less than 0.9997.

Instructions for Reporting PM emissions on Forms B4 and B4U

- Enter Activity code 36 for activity "Spray booth –particulate emissions" in column "Activity Code". In column "TAC/ODC" indicate if PM emissions reported contain any TAC/ODC. In column "Rule Number" enter only one corresponding rule number that best relates to your equipment and primary process. Enter the total quantity of the coatings used during the reporting period in "Annual Throughput" column. Identify the throughput unit and record in "Unit Code" column. If needed, convert coatings quantity from gallons to pounds by multiplying coatings quantity (in gallons) by the coating density (lb/gal).
- From coating MSDS or Product Data Sheet, find solid content (S). Unit of S must be consistent with that of coatings applied, i.e., S in weight fraction or lb/lb for annual throughput in pounds and S in lb/gal for annual throughput in gallons.
- Determine the applicable control efficiency (CE = 0.90 or 0.95 or 0.9997, or 0.0 if coating is performed **outside** the spray booth). Substantiate with documentation for the use of HEPA filter efficiency.
- Calculate PM **emission factor** by using equation above: multiply solid content (S) by one minus transfer efficiency (1-TE) and then by one minus control system efficiency (1-CE). **Record the result in Particulate Matter Emission Factor (for paper - smaller box in column "k").**
- For software PM emissions will be automatically calculated and transferred. For paper calculate the PM **emissions** (in pounds) by multiply annual throughput in column "c" (step a) by emission factor (step d) and enter in **larger box** column "k" in pounds. Record the emission source reference number (form and row) on Form ES.

SPECIAL NOTE for calculating toxic PM emission factors:

This methodology is also applicable in calculating toxic PM emission factors, i.e., Hexavalent Chromium and Lead from spray coating operations, by replacing the solid content with toxic metal content in equation above. Supporting documentation from the manufacturer of filters used has to be submitted with the emission report. **If a multi-stage filtration system is used, the overall control efficiency for the filtration system shall be the highest control efficiency for the smallest particle size (efficiency of the last stage).** Typically, a fall-out factor is not allowed unless it is evaluated by the District staff and conditions are included in permits.

Cleaning the air that we breathe...