



South Coast Air Quality Management District

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Guidelines for Particulate Matter (PM) Emissions Calculations for Spray Coating Operations

The following methodology should be used to calculate PM emissions from coating operations and report using Form B4:

$$E_{PM} = Q \times S \times (1 - TE) \times (1 - CE) \quad \text{Eq. (1)}$$

where:

E_{PM}	=	Emissions of particulate matter (lbs)
Q	=	Quantity of coatings applied (gallons or pounds)
$S^{(1)}$	=	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 Sheet (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
SOLID FACTOR:	3.0 lb/gal

NOTE: Unit of S must be consistent with that of coatings applied (Q), i.e., S in weight fraction or lb/lb for Q in pounds and S in lb/gal for Q 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 and depending on type of coating operation, the following default TE can be used.

SPRAY	TE = 0.65
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OTHERS

TE = 1.00

NOTE: Other coating operations include flow, roller, and dip coating

- (3) If coating is performed **inside** a spraybooth 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
3-STAGE AEROSPACE NESHAP-COMPLAINT FILTERS:	CE = 0.95
HIGH EFFICIENCY PARTICLE ARRESTOR (HEPA):	CE = 0.9997

Instructions for Reporting PM on Forms B4 and B4U

- a) Enter the total quantity of the coatings (Q) used during the reporting period (annual throughput). Identify the correct throughput unit. If needed, convert Q from gallons to pounds by multiplying Q (in gallons) by the coating density (lb/gal).
- b) From coating MSDS or Product Data Sheet, find solid content (S). If data is not available, a default factor can be used. Unit of S must be consistent with that of coatings applied (Q), i.e., S in weight fraction or lb/lb for Q in pounds and S in lb/gal for Q in gallons.
- c) Determine the applicable control efficiency (CE = 0.90, 0.95, 0.9997, or 0.0 if coating is performed **outside** the spraybooth). Substantiate with documentation for the use of HEPA filter efficiency.
- d) Calculate and record PM **emission factor** by multiply solid content (S) by one minus transfer efficiency (1-TE) and then by one minus control system efficiency (1-CE).
- e) PM **emissions** (in pounds) are calculated by the program by multiply throughputs Q by emission factor (step d).

SPECIAL NOTE: This methodology is also applicable in calculating toxic PM emissions, i.e., Hexavalent Chromium and Lead from coating operations, by replacing the solid content with toxic metal content in Equation (1).