

M02-M04 - METAL DEPOSITION, PLASMA SPRAY, SITE SPECIFIC TEST RESULTS, PRAXAIR AI-1015 (PWA 1315F) WITH WATER CURTAIN, FLAME SPRAY INC.

CALCULATION METHODS

Annual Emissions: $E_a = U_a \times EF \text{ (lbs/lb sprayed)} \times C_i$

Hourly Emissions: $E_h = U_h \times EF \text{ (lbs/lb sprayed)} \times C_i$

E_a = Annual emissions of each listed toxic air contaminant per material, (lbs/year)

E_h = Maximum hourly emissions of each listed toxic air contaminant per material, (lbs/hour)

U_a = Annual usage of each material sprayed, (lbs/year)

U_h = Maximum hourly usage of each material sprayed, (lbs/hour)

EF = Emission Factor (lbs/lb sprayed)

C_i = Toxic air contaminant specific concentration (weight percent)

NOTES:

- PM10 Emission Factors developed from Sum of Ni & Cr Source Test Results:

•Flame Spray Inc: 1997 Source Test Material Praxair AI-1015 (PWA 1315F) composition: Cr 20% and Ni 80% = 100%.

- All emissions for this calculation procedure are assumed to be Ducted.

- Annual (U_a) and maximum hourly (U_h) throughputs must be individually reported for each material sprayed.

- Site and material specific emission factors should be used where available.

- Combustion related emissions of NO_x, CO, SO_x, PIC's, etc. are assumed to be negligible as no emissions information currently exists.

- For Emissions Inventory:

•Trace metal composition is assumed to be equivalent to the PM10 fraction.

•Base factors on actual Source Test (ST) data if available.

•Method for estimating annual and max hourly emissions will use Emission Factor PM10 EF (Lb / Lb overall sprayed).

POLLUTANT	DISTRICT EMISSION FACTORS (lbs emitted / lb Overall sprayed)	EMISSION FACTORS (lbs individual metal released / lb individual metal sprayed)	REFERENCE DOCUMENT	TEST LOCATION	(UNITS)	COMMENTS
NOX						
CO						
SOX						
TOG						
VOC						
TSP	7.81E-04	1.48E-03		FLAME SPRAY	lbs/lb material sprayed	Assume PM10 = TSP. Base this estimate on overall usage (lbs of material).
PM10	7.81E-04	1.48E-03		FLAME SPRAY	lbs/lb material sprayed	Base this estimate on overall usage (lbs of material).
Total Chromium	1.34E-04	6.72E-04	Site Specific test result	FLAME SPRAY		
Chromium Hexavalent	5.34E-05	2.67E-04	Site Specific test result	FLAME SPRAY		Hexavalent chromium conversion rates (HCR) based on Flame Spray Inc 1997 Source Test = $Cr_{6+}/Total\ Cr = 5.34E-05/1.34E-04 \approx 40\%$. EF lbs. emitted / lb metal in = lb Hex. Cr emitted/lb Total Cr sprayed. $C_i = Total\ Cr\ C_i \times HCR$.
Chromium NonHexavalent	8.09E-05	4.05E-04	Site Specific test result	FLAME SPRAY		NonHexavalent chromium conversion rates based on Flame Spray Inc 1997 Source Test = $1-HCR = 1-(5.34E-05/1.34E-04) \approx 60\%$. $C_i = Total\ Cr\ C_i \times (100\% - HCR)$.

Nickel	6.47E-04	8.08E-04	Site Specific test result	FLAME SPRAY		
* Other Listed Metals	7.81E-04	1.48E-03	Sum of Ni & Cr test results	FLAME SPRAY		Assume other metals released at a rate equal TSP/PM10 EF.

Last Updated on 10/27/2025

By H. Fritschen