Emissions Estimate for Powder Coat Operations

**Parts Cleaning:**
Parts cleaning is performed using an aqueous parts cleaner. No solvent is employed.

**Dry-Off Oven:**
Compressed air is used to remove the majority of water from the cleaned parts. Parts are dried of remaining water in an electric dry-off oven. This activity is not a source of combustion products.

**Powder Coat Booth Emissions:**
average annual powder coating usage = ~1,500 lbs total
average operating hours: 8 hrs/day, 5 days/week, 50 weeks/yr = 2000 hrs/yr

per AP-42, transfer efficiency for powders ~93%; taking 7% powder coating usage as overspray
powder coating operations performed in an enclosed system (paint booth) where overspray collected for recycle/reuse; estimated 80% capture efficiency for overspray collection system

estimated average annual fugitive particulate emissions from powder coating:
(1,500 lbs av. powder coating usage) x (7% overspray) = 105 lbs
(105 lbs) x (1 - 80% capture efficiency) = 21 lbs PART = 0.0105 TPY PART

average estimated emission rate:
(105 lbs PART) / (2000 hrs/yr) = 0.05 lbs PART per hour

PTE based upon estimated hourly emission rate:
(0.05 lbs PART / hour) x (8,760 hrs max per year) = 438 lbs PART = ~0.22 TPY PART

*Please note:* as no organic HAPs are contained in the powder coatings used, the Misc. Metal Parts & Products NESHAP (Subpart MMMM) does not apply to this coating operation.
**Powder Cure Oven:**
natural gas-fired IR oven used to cure powder coating

Calculation of Maximum Natural Gas Usage:
- maximum firing rate = 0.15 mmBTU/hr
- maximum operating hours = 24 hr/day, 365 days/yr = 8,760 hrs/yr

max natural gas usage = (0.15 mmBTU/hr)(8,760 hrs/yr)/(1,000 BTU per cft natural gas) = 1.314 mmcft/yr

Calculation of Maximum Emissions from Natural Gas Combustion:
- maximum firing rate = 0.15 mmBTU/hr

max emissions using AP-42 emissions factors:

NOx:  
= (0.15 mmBTU/hr)(100 lb NOx/mmcft)/(1000 BTU/cft) = 0.015 lb NOx/hr (8,760 hrs/yr)/(2000 lbs/ton) = 0.066 TPY NOx

CO:  
= (0.15 mmBTU/hr)(84 lb CO/mmcft)/(1000 BTU/cft) = 0.0126 lb CO/hr (8,760 hrs/yr)/(2000 lbs/ton) = 0.055 TPY CO

PM:  
= (0.15 mmBTU/hr)(7.6 lb PM/mmcft)/(1000 BTU/cft) = 0.00114 lb PM/hr (8,760 hrs/yr)/(2000 lbs/ton) = 0.005 TPY PM

VOM:  
= (0.15 mmBTU/hr)(5.5 lb VOM/mmcft)/(1000 BTU/cft) = 0.0008 lb VOM/hr (8,760 hrs/yr)/(2000 lbs/ton) = 0.004 TPY VOM

SO₂:  
= (0.15 mmBTU/hr)(0.6 lb SO₂/mmcft)/(1000 BTU/cft) = 0.0001 lb SO₂/hr (8,760 hrs/yr)/(2000 lbs/ton) = 0.0004 TPY SO₂

NH₃:  
= (0.15 mmBTU/hr)(3.2 lb NH₃/mmcft)/(1000 BTU/cft) = 0.0005 lb NH₃/hr (8,760 hrs/yr)/(2000 lbs/ton) = 0.002 TPY NH₃

**Overall PTE Emissions Estimate:**
- no HAP emissions
- max pollutant: particulate = ~0.225 TPY < 5 TPY

Therefore, the powder coating operations qualify as an insignificant activity.