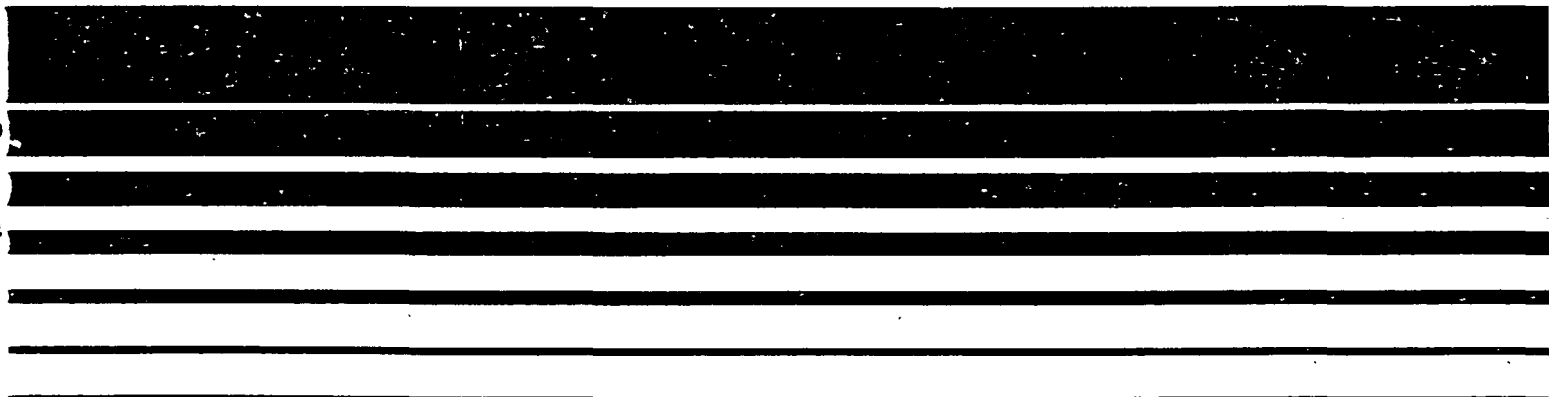




PM₁₀ EMISSION FACTOR LISTING
DEVELOPED BY
TECHNOLOGY TRANSFER
AND
AIRS SOURCE CLASSIFICATION
CODES
WITH DOCUMENTATION



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WITH DOCUMENTATION

By

Engineering Science
Cary, NC 27511

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Office Of Air Quality Planning And Standards
Office Of Air And Radiation
U. S. Environmental Protection Agency
Research Triangle Park, NC 27711

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This report has been reviewed by the Office Of Air Quality Planning And Standards, U. S. Environmental Protection Agency, and has been approved for publication as received from the contractor. Approval does not signify that the contents necessarily reflect the views and policies of the Agency, neither does mention of trade names or commercial products constitute endorsement or recommendation for use.

EPA-450/4-89-022

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AIRS SOURCE CLASSIFICATION CODES
PM₁₀ EMISSION FACTOR LISTING
BY TECHNOLOGY TRANSFER

INTRODUCTION

This document supplements the second edition of the "NEDS Source Classification Codes and Emission Factor Listing - PM₁₀" published in August, 1988. A companion document provides SCC/emission factor data on other air pollutants (SOx, NOx, VOC, CO, PM): AIRS Facility Subsystem Source Classification Codes And Emission Factor Listing For Criteria Air Pollutants, EPA-450/4-90-003, March 1990.

These documents support the EPA-required annual reporting by states of the emissions of pollutants for which EPA has established National Ambient Air Quality Standards (NAAQS). The Source Classification Codes (SCCs) are those required for storing source and emissions data in EPA's AIRS Facility Subsystem (AFS), and in States' computerized source files. The emission factors are default values, provided by EPA for use when the preferred source-specific values are not available to the reporting agency.

The PM₁₀ emission factors in this document have been compiled by technology transfer, in which a PM₁₀ source not yet characterized by a PM₁₀ emission factor is related by engineering judgement to a similar source with established PM₁₀ and PM emission factors. The PM₁₀ weight percent of the known source's PM emissions is applied to the PM emission factor of the similar source to be characterized. No judgement of the accuracy of the PM₁₀ emission factors produced by this process is attempted. Such PM₁₀ emission factors are, however, considered to be approximately as accurate as default estimates. Documentation for emissions factors presented in this document is provided in the Appendix.

PM and PM₁₀ emission factor data used in this technology transfer process are derived from the information in the following three EPA publications: (1) Compilation of Air Pollutant Emission Factors, AP-42, fourth edition, through Supplement A, October 1986 and Supplement B, September 1988; (2) Gap-Filling PM₁₀ Emission Factors for Selected Open Area Dust Sources, EPA-450/4-88-003, February 1988, and (3) Criteria Pollutant Emission Factors for the 1985 NAPAP Emissions Inventory, EPA/600/7-87/015, May 1987. Comments or questions on the emission factors should be addressed to the Criteria Emissions Section (MD-14), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711. The telephone number is (919) 541-5575 (FTS 629-5575).

Key to PM₁₀ Emission Factors

1. An "A" accompanying an emission factor means that this factor is the weighted average ash content of the fuel burned, expressed as a percent. See, for example, SCC 1-01-008-01 on the facing page. If the weighted average ash content of the coke burned were five percent (5%), then the emission factor would become 7.9×5 or 39.5 pounds of PM₁₀ emitted (before control) per ton of coke burned.
2. An "S" accompanying an emission factor means that this factor is the weighted average sulfur content of the fuel burned, expressed as a percent. See, for example, SCC 3-10-004-02 on page 31. If the weighted average sulfur content of the residual oil burned were three percent (3%), then the emission factor would become 10.3×3 or 30.9 pounds of PM₁₀ emitted (before control) per one thousand gallons of residual oil burned.
3. The entry "___" means that as yet we have no emission factor for this SCC. See, for example, SCC 1-01-002-17 on the facing page.
4. The "Reference Number", in the column on the right side of the listing, identifies the respective emission factor documentation, given in the appendix.

AIRS SOURCE CLASSIFICATION CODES AND PM₁₀ EMISSION FACTOR
LISTING BY TECHNOLOGY TRANSFER

Page Number*	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>EXTERNAL COMBUSTION BOILERS - ELECTRIC GENERATION - 4911</u>					
		<u>Bituminous Coal</u>			
5	1-01-002-17	- Atmospheric Fluid Bed	—	Tons Burned	1
		<u>Process Gas (Specify Gas in Comments)</u>			
6	1-01-007-01	- Boilers Over 100 MMBtu/Hr	3.0	10 ⁶ Cu. Ft. Burned	2
6	1-01-007-02	- Boilers under 100 MMBtu/hr	3.0	10 ⁶ Cu. Ft. Burned	3
		<u>Coke</u>			
6	1-01-008-01	- All Boiler Sizes	7.9A	Tons Burned	4
		<u>Liquified Petroleum Gas (LPG)</u>			
6	1-01-010-01	- Butane	0.28	10 ³ Gal. Burned	5
6	1-01-010-02	- Propane	0.26	10 ³ Gal. Burned	6
		<u>Bagasse</u>			
6	1-01-011-01	- All Boiler Sizes	5.6	Tons Burned	7
		<u>Liquid Waste</u>			
6	1-01-013-02	- Waste Oil	12.5	10 ³ Gal. Burned	8
<u>EXTERNAL COMBUSTION BOILERS - INDUSTRIAL</u>					
		<u>Anthracite Coal</u>			
6	1-02-001-07	- Hand-Fired	5.2	Tons Burned	9
		<u>Process Gas</u>			
6	1-02-007-01	- Petroleum Refinery Gas	3.0	10 ⁶ Cu. Ft. Burned	10

*In the second edition of "NEDS Source Classification Codes and Emission Factor Listing - PM₁₀",
ed August, 1988.

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
	<u>Coke</u>				
6	1-02-008-02	- All Boiler Sizes	5.5A	Tons Burned	11
6	1-02-008-04	- Cogeneration	5.5A	Tons Burned	12
	<u>Wood/Bark Waste</u>				
8	1-02-009-03	- Wood-Fired Boiler (Greater than 50,000 LB Steam)	7.9	Tons Burned	13
8	1-02-009-06	- Wood-Fired Boiler (Less than 50,000 LB Steam)	7.9	Tons Burned	14
	<u>Liquified Petroleum Gas (LPG)</u>				
8	1-02-010-01	- Butane	0.28	10 ³ Gal. Burned	15
8	1-02-010-02	- Propane	0.26	10 ³ Gal. Burned	16
	<u>Bagasse</u>				
8	1-02-011-01	- All Boiler Sizes	5.6	Tons Burned	17
	<u>CO Boiler</u>				
8	1-02-014-01	- Natural Gas	3.0	10 ⁶ Cu. Ft. Burned	18
8	1-02-014-02	- Process Gas	3.0	10 ⁶ Cu. Ft. Burned	19
<u>EXTERNAL COMBUSTION BOILERS - COMMERCIAL/INSTITUTIONAL</u>					
	<u>Anthracite Coal</u>				
8	1-03-001-03	- Hand-Fired	5.2	Tons Burned	20
	<u>Bituminous Coal</u>				
9	1-03-002-14	- Hand Fired	7.8	Tons Burned	21
	1-03-002-17	- Atmospheric Fluid Bed		Tons Burned	21b

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
9		<u>Wood/Bark Waste</u> 1-03-009-03 - Wood-Fired Boiler	7.9	Tons Burned	22
9		<u>Liquid Petroleum Gas (LPG)</u> 1-03-010-01 - Butane	0.28	10 ³ Gal. Burned	23
9		1-03-010-02 - Propane	0.26	10 ³ Gal. Burned	24
<u>EXTERNAL COMBUSTION - SPACE HEATERS</u>					
10		<u>Industrial Space Heaters</u> 1-05-001-05 - Distillate Oil	1.25 2.46	10 ³ Gal. Burned	25
10		1-05-001-06 - Natural Gas	3.0	10 ⁶ Cu. Ft. Burned	26
10		1-05-001-10 - Liquified Petroleum Gas (LPG)	1.85	10 ³ Gal. Burned	27
10		<u>Commercial Space Heaters</u> 1-05-002-05 - Distillate Oil	1.25 2.46	10 ³ Gal. Burned	28
10		1-05-002-06 - Natural Gas	3.0	10 ⁶ Cu. Ft. Burned	29
10		1-05-002-09 - Wood	25.0	Tons Burned	30
10		1-05-002-10 - Liquified Petroleum Gas (LPG)	1.85	10 ³ Gal. Burned	31
<u>INTERNAL COMBUSTION ENGINES - ELECTRIC GENERATION - 4911</u>					
10		<u>Distillate Oil (Diesel)</u> 2-01-001-01 - Turbine	4.8	10 ³ Gal. Burned	32
10		2-01-001-02 - Reciprocating	32.0	10 ³ Gal. Burned	33
10		<u>Natural Gas</u> 2-01-002-01 - Turbine	14.0	10 ⁶ Cu. Ft. Burned	34
10		2-01-002-02 - Reciprocating	10.0	10 ⁶ Cu. Ft. Burned	35
10		<u>Kerosene/Naphtha (Jet Fuel)</u> 2-01-009-01 - Turbine	4.8	10 ³ Gal. Burned	36

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
10	2-01-009-02	- Reciprocating	32.0	10 ³ Gal. Burned	37
<u>INTERNAL COMBUSTION - INDUSTRIAL</u>					
	<u>Distillate Oil (Diesel)</u>				
10	2-02-001-01	- Turbine	4.8	10 ³ Gal. Burned	38
10	2-02-001-02	- Reciprocating	32.0	10 ³ Gal. Burned	39
10	2-02-001-03	- Turbine: Cogeneration	4.8	10 ³ Gal. Burned	40
10	2-02-001-04	- Reciprocating: Cogeneration	32.0	10 ³ Gal. Burned	41
	<u>Natural Gas</u>				
10	2-02-002-01	- Turbine	14.0	10 ⁶ Cu. Ft. Burned	42
10	2-02-002-02	- Reciprocating	10.0	10 ⁶ Cu. Ft. Burned	43
11	2-02-002-03	- Turbine: Cogeneration	14.0	10 ⁶ Cu. Ft. Burned	44
11	2-02-002-04	- Reciprocating Cogeneration	10.0	10 ⁶ Cu. Ft. Burned	45
	<u>Gasoline</u>				
11	2-02-003-01	- Reciprocating	6.2	10 ³ Gal. Burned	46
	<u>Large Bore Engine</u>				
11	2-02-004-01	- Diesel	46.0	10 ³ Gal. Burned	47
11	2-02-004-02	- Dual Fuel (Oil/Gas)	2.0	10 ³ HP-Hours	48
11	2-02-004-03	- Dual Fuel (Cogeneration)	0.032	10 ⁵ Brake HP-Hours	49
	<u>Residual/Crude Oil</u>				
11	2-02-005-01	- Reciprocating	30.8	10 ³ Gal. Burned	50
	<u>Kerosene/Naphtha (Jet Fuel)</u>				
11	2-02-009-01	- Turbine	4.8	10 ³ Gal. Burned	51
11	2-02-009-02	- Reciprocating	32.0	10 ³ Gal. Burned	52

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>Liquified Petroleum Gas (LPG)</u>					
11		2-02-010-01 - Propane: Reciprocating	5.0	10 ³ Gal. Burned	53
11		2-02-010-02 - Butane: Reciprocating	5.0	10 ³ Gal. Burned	54
<u>INTERNAL COMBUSTION - COMMERCIAL/INSTITUTIONAL</u>					
<u>Distillate Oil (Diesel)</u>					
11		2-03-001-01 - Reciprocating	32.0	10 ³ Gal. Burned	55
11		2-03-001-02 - Turbine	4.8	10 ³ Gal. Burned	56
<u>Natural Gas</u>					
11		2-03-002-01 - Reciprocating	10.0	10 ⁶ Cu. Ft. Burned	57
11		2-03-002-02 - Turbine	14.0	10 ⁶ Cu. Ft. Burned	58
<u>Gasoline</u>					
11		2-03-003-01 - Reciprocating	6.2	10 ³ Gal. Burned	59
<u>Liquified Petroleum Gas (LPG)</u>					
11		2-03-010-01 - Propane: Reciprocating	5.0	10 ³ Gal. Burned	60
11		2-03-010-02 - Butane: Reciprocating	5.0	10 ³ Gal. Burned	61
<u>INTERNAL COMBUSTION - ENGINE TESTING</u>					
<u>Aircraft</u>					
11		2-04-001-01 - Turbojet	11.3	10 ³ Gal. Fuel	62
11		2-04-001-02 - Turboshift	11.3	10 ³ Gal. Fuel	63
<u>Turbine</u>					
11		2-04-003-01 - Natural Gas	14.0	10 ⁶ Cu. Ft. Burned	64
11		2-04-003-02 - Diesel/Kerosene	4.8	10 ³ Gal. Burned	65
<u>Reciprocating</u>					
12		2-04-004-01 - Gasoline	6.2	10 ³ Gal. Burned	66

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
12	2-04-004-02	- Diesel/Kerosene	32.0	10 ³ Gal. Burned	67
<u>CHEMICAL MANUFACTURING - MAJOR GROUP 28</u>					
<u>Adipic Acid - 2869</u>					
12	3-01-001-01	- General	0.037	Tons of Product	68
12	3-01-001-05	- Apidic Acid Refining	0.004	Tons of Product	69
12	3-01-001-06	- Adipic Acid Drying/Loading and Storage	0.032	Tons of Product	70
<u>Ammonia Production - 2873</u>					
12	3-01-003-06	- Primary Reformer: Natural Gas Fired	0.144	Tons Produced	71
12	3-01-003-07	- Primary Reformer: Oil Fired	0.86	Tons Produced	72
<u>Carbon Black Production - 2895</u>					
12	3-01-005-03	- Gas Furnace Process (Main Process Vent)	3.2	Tons Produced	74
12	3-01-005-04	- Oil Furnace Process (Main Process Vent)	6.53	Tons Produced	75
12	3-01-005-06	- Transport Air Vent	0.58	Tons Produced	76
12	3-10-005-07	- Pellet Dryer	0.45	Tons Produced	77
12	3-01-005-08	- Bagging/Loading	0.06	Tons Produced	78
12	3-01-005-09	- Furnace Process Fugitive Emissions	0.2	Tons Produced	79
<u>Charcoal Manufacture - 2861</u>					
13	3-01-006-03	- Batch Kiln	255.4	Tons Produced	80
13	3-01-006-04	- Continuous Furnace	255.4	Tons Produced	81
13	3-01-006-05	- Briquetting	24.1	Tons Produced	82

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>Explosives - Trinitrotoluene - 2892</u>					
13	3-01-010-15	- Batch Process: Red Water Incinerator	23.5	Tons Produced	83
13	3-01-010-23	- Continuous Process: Red Water Incinerator	0.24	Tons Produced	84
13	3-01-010-30	- Open Burning: Waste	_____	Tons TNT Burned	85
<u>Phosphoric Acid: Thermal Process - 2874</u>					
14	3-01-017-03	- Absorber w/ Packed Tower	2.14	Tons P ₂ O ₅ Produced	86
14	3-01-017-04	- Absorber w/ Venturi Scrubber	2.53	Tons P ₂ O ₅ Produced	87
14	3-01-017-05	- Absorber w/ Glass Mist Eliminator	0.69	Tons P ₂ O ₅ Produced	88
14	3-01-017-06	- Absorber w/ Wire Mist Eliminator	5.46	Tons P ₂ O ₅ Produced	89
15	3-01-017-07	- Absorber w/ High-pressure Mist Eliminator	0.11	Tons P ₂ O ₅ Produced	90
15	3-01-017-08	- Absorber w/ Electrostatic Precipitator	1.66	Tons P ₂ O ₅ Produced	91
<u>Plastics Production - Specific Products - 2821</u>					
15	3-01-018-01	- Polyvinyl Chlorides & Copolymers	23.0	Tons Product	92
15	3-01-018-02	- Polypropylene and Copolymers	2.0	Tons Product	93
<u>Phthalic Anhydride - 2865</u>					
16	3-01-019-02	- o-Xylene Oxidation: Pre-treatment	12.2	Tons Produced	94
16	3-01-019-06	- Naphthalene Oxidation: Pre-treatment	4.7	Tons Produced	95
<u>Printing Ink Manufacturer - 2893</u>					
16	3-01-020-05	- Pigment Mixing	_____	Tons Pigment	96

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
16	<u>Sodium Carbonate - 2812</u>				
16	3-01-021-02	- Solvay: Handling	10.5	Tons Produced	97
16	3-01-021-06	- Rotary Dryer: Gas-Fired	17.6	Tons Product	98a
16	3-01-021-14*	- Rotary Dryer: Steam Tube	14.0	Tons Product	98b
18	<u>Ammonium Nitrate Production - 2873</u>				
18	3-01-027-04	- Neutralizer	4.35	Tons Produced	99
18	3-01-027-08	- Pan Granulator	0.05	Tons Produced	100
18	3-01-027-09	- Bulk Loading (General)	_____	Tons Produced	101
18	3-01-027-10	- Bagging Product	_____	Tons Produced	102
18	3-01-027-11	- Neutralizer (High Density)	4.35	Tons Produced	103
18	3-01-027-12	- Prilling Tower (High Density)	3.0	Tons Produced	104
18	3-01-027-14	- Prill Coolers (High Density)	0.01	Tons Produced	105
18	3-01-027-17	- Evaporator/ Concentrator (High Density)	0.49	Tons Produced	106
18	3-01-027-18	- Coating (High Density)	3.4	Tons Produced	107
18	3-01-027-21	- Neutralizer (Low Density)	4.35	Tons Produced	108
18	3-01-027-27	- Evaporator Concentrator (Low Density)	0.49	Tons Produced	109
18	3-01-027-28	- Coating (Low Density)	3.4	Tons Produced	110

* New SCC

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<hr/>					
20		<u>Inorganic Pigments - 2816</u> 3-01-035-01 - Titanium TiO ₂ Sulfate Process: Calciner	27.6	Tons Produced	111
20		3-01-035-06 - Lead Oxide: Barton Pot	0.64	Tons Produced	112
20		3-01-035-07 - Lead Oxide: Calcining Furnace	15.0	Tons Produced	113
20		3-01-035-10 - Red Lead	1.0	Tons Produced	114
20		3-01-035-15 - White Lead	0.69	Tons Produced	115
20		3-01-035-20 - Lead Chromate	—	Tons Produced	116
20		3-01-035-51 - Ore Dryer	6.9	Tons Produced	117
21		<u>Urea Production - 2873</u> 3-01-040-02 - Solution Concentration (Controlled)	0.011	Tons Produced	118
21		3-01-040-03 - Prilling	3.57	Tons Produced	119
21		3-01-040-04 - Drum Granulation	4.82	Tons Produced	120
21		3-01-040-05 - Solid Product: Coating	3.4	Tons Produced	121
21		3-01-040-05 - Solid Product: Bagging	—	Tons Produced	122
21		3-01-040-07 - Bulk Loading	—	Tons Produced	123
21		<u>Lead Alkyl Manufacture - (Sodium/Lead Alloy Process) - 2869</u> 3-01-042-01 - Recovery Furnace	59.3	Tons Produced	124
21		3-01-042-04 - Sludge Pits	—	Tons Produced	125
25		<u>Ammonium Sulfate - 2873</u> 3-01-130-05 - Fluid Bed Dryer	21.8	Tons Produced	126
35		<u>Instant Coffee Products - 2095</u> 3-02-003-01 - Spray Dryer	0.93	Tons Green Beans	127

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>Cotton Ginning - 0724</u>					
35		3-02-004-01 - Unloading Fan	_____	Bales of Cotton	128
35		3-02-004-02 - Seed Cotton Cleaning System	_____	Bales of Cotton	129
35		3-02-004-03 - Stick/Burr Machine	_____	Bales of Cotton	130
35		3-02-004-04 - Miscellaneous (Lint Cleaner/Battery Conden- sers/Master Trash/Overflow/ Mote Fans)	_____	Bales of Cotton	131
35		3-02-004-10 - General (Entire Process, Alternative to Above)	_____	Bales of Cotton	132
<u>Feed and Grain Country Elevators - 5153, 4221</u>					
36		3-02-006-08 - Elevator Legs (Headhouse)	0.23	Tons Grain Processed	133
36		3-02-006-11 - Elevator Legs (Headhouse)	0.7	Tons Grain Shipped or Received	134
<u>Rye Milling - 2041</u>					
36		3-02-007-24 - Millhouse	42.7	Tons Grain Received	135
<u>Wheat Mills - 2041</u>					
36		3-02-007-34 - Millhouse	42.7	Tons Grain Received	136
<u>Fish Processing - 2077, 2091</u>					
38		3-02-012-05 - Steam Tube Dryer	1.05	Tons Fish Scrap	137
38		3-02-012-06 - Direct Fire Dryer	1.68	Tons Fish Scrap	138
<u>Aluminum Ore - Bauxite - 1051</u>					
40		3-03-000-02 - Drying Oven	0.70	Tons of Ore	139
<u>Aluminum Ore: Electro-Reduction - 3334</u>					
40		3-03-001-01 - Prebaked Reduction Cell	54.5	Tons of Molten Aluminum Produced	140

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
40	3-03-001-04	Materials Handling	5.8	Tons of Molten Aluminum Produced	141
41	3-03-001-10	Vertical Stud Soderberg: Fugitive Emis.	3.70	Tons of Molten Aluminum Produced	142
41	<u>Aluminum Hydroxide Calcining - 3334</u>				
41	3-03-002-01	Overall Process	24.0	Tons of Alumina Produced	143
41	<u>By-Product Coke Manufacturing - 3312</u>				
41	3-03-003-08	Oven/Door Leaks	0.48	Tons Coal Charged	144
41	3-03-003-10	Coal Crushing	0.05	Tons Coal Processed	145
41	3-03-003-12	Coke Crushing/Screening/Handling	0.04	Tons Coke Processed	146
41	3-03-003-14	Topside Leaks	0.08	Tons Coal Charged	147
41	<u>Coke Manufacture: Beehives - 3312</u>				
41	3-03-004-01	General	97.8	Tons Coal Charged	148
41	<u>Primary Copper Smelters - 3331</u>				
41	3-03-005-02	Multiple Hearth Roaster	23.8	Tons Concentrated Ore Processed	149
41	3-03-005-05	Fire (Furnace) Refining	9.2	Tons Concentrated Ore Processed	150
41	3-03-005-06	Ore Concentrate Dryer	4.8	Tons Concentrated Ore Processed	151
41	3-03-005-07	Reverberatory Smelting Furnace with Ore Charging (w/o Roasting)	13.5	Tons Concentrated Ore Processed	152a
41	3-03-005-09	Fluidized Bed Roaster	29.2	Tons Concentrated Ore Processed	152b
42	3-03-005-10	Electric Smelting Furnace	58.0	Tons Concentrated Ore Processed	153
42	3-03-005-12	Flash Smelting	83.0	Tons Concentrated Ore Processed	154

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
42	3-03-005-13	- Roasting: Fugitive Emissions	1.4	Tons Concentrated Ore Processed	155
42	3-03-005-14	- Reverberatory Furnace: Fugitive Emissions	0.17	Tons Concentrated Ore Processed	156
42	3-03-005-15	- Converter: Fugitive Emissions	2.6	Tons Concentrated Ore Processed	157
42	3-03-005-16	- Anode Refining Furnace: Fugitive Emissions	0.46	Tons Concentrated Ore Processed	158
42	3-03-005-17	- Slag Cleaning Furnace: Fugitive Emissions	7.7	Tons Concentrated Ore Processed	159
42	3-03-005-22	- Slag Cleaning Furnace	9.6	Tons Concentrated Ore Processed	160
42	3-03-005-23	- Reverberatory Furnace w/Converter	13.5	Tons Concentrated Ore Processed	161
42	3-03-005-25	- Fluid Bed Roaster w/Reverberatory Furnace and Converter	29.2	Tons Concentrated Ore Processed	163
42	3-03-005-26	- Concentrate Dryer w/Electric Furnace & Cleaning Furnace & Converter	4.8	Tons Concentrated Ore Processed	164a
42	3-03-005-27	- Concentrate Dryer w/Flash Furnace & Converter	4.8	Tons Concentrated Ore Processed	164b
42	3-03-005-28	- Noranda Reactor and Converter	—	Tons Concentrated Ore Processed	164c
42	3-03-005-29	- Multiple Hearth Roaster w/Reverberatory Furnace & Converter	23.8	Tons Concentrated Ore Processed	164d
42	3-03-005-30	- Fluid Bed Roaster w/Electric Furnace & Converter	29.2	Tons Concentrated Ore Processed	164e

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
42		3-03-005-31 - Reverberatory Furnace after Multiple Hearth Roaster	13.5	Tons Concentrated Ore Processed	164f
42		3-03-005-32 - Reverberatory Furnace after Fluid Bed Roaster	13.5	Tons Concentrated Ore Processed	164g
42		3-03-005-33 - Electric Furnace after Concentrate Dryer	58.0	Tons Concentrated Ore Processed	164h
42		3-03-005-34 - Flash Furnace after Concentrate Dryer	83.0	Tons Concentrated Ore Processed	164i
42		3-03-005-35 - Electric Furnace after Fluid Bed Roaster	58.0	Tons Concentrated Ore Processed	164j
42		<u>Ferroalloy (Open Furnace) - 3313</u> 3-03-006-02 - 75% Ferro-silicon: Elec. Smelting Furnaces	199	Tons Produced	165
42		3-03-006-03 - 90% Ferro-silicon: Elec. Smelting Furnaces	355	Tons Produced	166
43		<u>Ferroalloy (Semi-covered Furnace) - 3313</u> 3-03-007-01 - Ferromanganese: 2.56 10.8 Electric Arc Furnace		Tons Produced	167
43		<u>Iron Production - 3312</u> 3-03-008-01 - Blast Furnace: Ore Charge	41.8	Tons Iron Produced	168
43		3-03-008-02 - Blast Furnace: Agglomerates Charge	15.2	Tons Iron Produced	169
43		<u>Sintering - 3312</u> 3-03-008-14 - Sinter Discharge End	1.02	Tons Sinter Produced	170
43		3-03-008-17 - Sinter Cooler	0.45	Tons Sinter Produced	171

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
43	3-03-008-19	- Sinter Processing (Combined Code Includes 15, 16, 17, 18)	0.12	Tons Sinter Produced	172
43	3-03-008-20	- Sinter Conveyor: Transfer Station	0.013	Tons Sinter Transferred	173
44	3-03-008-26	- Blast Furnace Slips	33.0	Number of Slips	174
44	<u>Steel Production - 3312</u>				
44	3-03-009-04	- Electric Arc Furnace: Stack (Alloy Steel)	6.55	Tons Produced	175
44	3-03-009-08	Electric Arc Furnace: Stack (Carbon Steel)	29.0	Tons Produced	176
44	3-03-009-13	- Basic Oxygen Furnace: Open Hood - Stack	13.1	Tons Produced	177
44	3-03-009-14	- Basic Oxygen Furnace: Closed Hood - Stack	13.1	Tons Produced	178
44	3-03-009-15	- Hot Metal (Iron) Transfer to Steel-making Furnace	0.09	Tons Produced	179
44	3-03-009-21	- Teeming (Unleaded Steel)	0.03	Tons Produced	180
45	3-03-009-25	- Teeming (Leaded Steel)	0.36	Tons Produced	181
45	3-03-009-32	- Machine Scarfing	0.1	Tons Produced	182
45	<u>Lead Smelters - 3332</u>				
45	3-03-010-05	- Materials Handling (Includes 11,12, 13,04,14)	4.25	Tons of Lead Processed	183
45	3-03-010-06	- Sintering: Dual Stream Feed End	181.0	Tons of Concentrated Ore Processed	184

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
45	3-03-010-08	- Slag Fume Furnace	1.29	Tons of Lead Processed	185
45	3-03-010-09	- Lead Drossing	0.47	Tons of Lead Processed	186
45	3-03-010-10	- Crushing & Grinding	0.85	Tons Processed	187
45	3-03-010-11	- Raw Material Unloading	0.34	Tons of Raw Material	188
45	3-03-010-12	- Raw Material Storage Piles	0.26	Tons of Raw Material	189
45	3-03-010-13	- Raw Material Transfer	0.43	Tons of Raw Material	190
45	3-03-010-14	- Sintering Charge Mixing	1.90	Tons of Raw Material	191
45	3-03-010-15	- Sinter Crushing/Screening	0.12	Tons of Sinter	192
45	3-03-010-16	- Sinter Transfer	0.015	Tons of Sinter	193
45	3-03-010-17	- Sinter Fines Return Handling	4.8	Tons of Sinter	194
45	3-03-010-19	- Blast Furnace Tapping (Metal and Slag)	0.07	Tons of Lead Product	195
45	3-03-010-20	- Blast Furnace Lead Pouring	0.93	Tons of Lead Product	196
45	3-03-010-21	- Blast Furnace Slag Pouring	0.13	Tons of Lead Product	197
45	3-03-010-22	- Lead Refining/ Silver Retort Building	1.76	Tons of Lead Product	198
45	3-03-010-23	- Lead Casting	0.85	Tons of Lead Product	199
45	3-03-010-24	- Reverberatory or Kettle Softening	2.94	Tons of Lead Product	200

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
45	3-03-010-25	Sinter Machine Leakage	0.67	Tons of Sinter	201
45	3-03-010-26	Sinter Dump Area	0.0008	Tons of Sinter	202
46	<u>Titanium Processing - 3339, 3369, 3356</u>				
46	3-03-012-02	Drying Titanium Sand Ore (Cyclone Exit)	0.43	Tons Processed	203
46	<u>Taconite Iron Ore Processing - 1011</u>				
46	3-03-023-04	Ore Transfer	0.085	Tons Pellets Produced	204
46	3-03-023-07	Bentonite Storage	0.03	Tons Pellets Produced	205
46	3-03-023-12	Indurating Furnace: Gas Fired	24.8	Tons Pellets Produced	206
46	3-03-023-13	Indurating Furnace: Oil Fired	24.8	Tons Pellets Produced	207
46	3-03-023-14	Indurating Furnace: Coal Fired	24.8	Tons Pellets Produced	208
46	3-03-023-21	Haul Road: Rock	6.2	Vehicle-Miles Traveled	209
46	3-03-023-22	Haul Road: Taconite	5.2	Vehicle-Miles Traveled	210
46	<u>Metal Mining - General Processes - 1011-1099</u>				
46	3-03-024-01	Primary Crushing (low moisture ore)	0.05	Tons Ore Processed	211
46	3-03-024-02	Secondary Crushing (low moisture ore)	0.10	Tons Ore Processed	212
46	3-03-024-03	Tertiary Crushing (low moisture ore)	0.16	Tons Ore Processed	213
46	3-03-024-04	Material Handling (low moisture ore)	0.06	Tons Ore Processed	214

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
47	3-03-024-05	Primary Crushing (high moisture ore)	0.009	Tons Ore Processed	215
47	3-03-024-06	Secondary Crushing (high moisture ore)	0.02	Tons Ore Processed	216
47	3-03-024-07	Tertiary Crushing (high moisture ore)	0.02	Tons Ore Processed	217
47	3-03-024-08	Material Handling (high moisture ore)	0.005	Tons Ore Processed	218
47	3-03-024-09	Dry Grinding w/air conveying	20.2	Tons Ore Processed	219
47	3-03-024-10	Dry Grinding w/o air conveying, etc.	2.35	Tons Ore Processed	220
47	3-03-024-11	Ore Drying	12.0	Tons Ore Processed	221
<u>Zinc Smelting - 3339</u>					
47	3-03-030-09	Raw Material Handling and Transfer	3.4	Tons Processed	222
47	3-03-030-10	Sinter Breaking and Cooling	1.3	Tons Processed	223
47	3-03-030-11	Zinc Casting	2.1	Tons Processed	224
47	3-03-030-12	Raw Material Unloading	0.23	Tons Processed	225
<u>Secondary Copper Smelting and Alloying (Brass/Bronze Melt)</u> <u>3341, 3362</u>					
48	3-04-002-07	Scrap Dryer (Rotary)	253.0	Tons of Charge	226
48	3-04-002-08	Wire Burning (Incinerator)	253.0	Tons of Charge	227
<u>Cupolas</u>					
48	3-04-002-10	Charge w/ Scrap Copper	0.00027	Tons of Charge	228
48	3-04-002-11	Charge w/ Insulated Copper Wire	211.6	Tons of Charge	229

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
48	3-04-002-12	- Charge w/ Scrap Copper and Brass	64.4	Tons of Charge	230
		<u>Reverberatory Furnace</u>			
48	3-04-002-14	- Charge w/Copper	5.1	Tons of Charge	231
48	3-04-002-15	- Charge w/ Brass and Bronze	21.2	Tons of Charge	232
		<u>Rotary Furnace</u>			
48	3-04-002-17	- Charge w/ Brass and Bronze	177	Tons of Charge	233
		<u>Crucible and Pot Furnaces</u>			
48	3-04-002-19	- Charge w/ Brass and Bronze	12.4	Tons of Charge	234
		<u>Electric Arc Furnace</u>			
49	3-04-002-20	- Charge w/Copper	5.0	Tons of Charge	235
49	3-04-002-21	- Charge w/Brass and Bronze	6.5	Tons of Charge	236
		<u>Electric Induction Furnace</u>			
49	3-04-002-23	- Charge w/Copper	7.0	Tons of Charge	237
49	3-04-002-24	- Charge w/Brass and Bronze	20.0	Tons of Charge	238
		<u>Fugitive Emissions</u>			
49	3-04-002-31	- Scrap Dryer	8.2	Tons of Charge	239
49	3-04-002-32	- Wire Incinerator	8.2	Tons of Charge	240
49	3-04-002-33	- Sweating Furnace	0.45	Tons of Charge	241
49	3-04-002-34	- Cupola Furnace	2.2	Tons of Charge	242
49	3-04-002-35	- Reverberatory Furnace	3.1	Tons of Charge	243
49	3-04-002-36	- Rotary Furnace	2.6	Tons of Charge	244
49	3-04-002-37	- Crucible Furnace	0.29	Tons of Charge	245

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
49	3-04-002-38	- Electric Induction Furnace	0.08	Tons of Charge	246
49	3-04-002-39	- Casting Operations	0.015	Tons of Casting Produced	247
49	<u>Gray Iron Foundries - 3321</u>				
49	3-04-003-02	- Reverberatory Furnace	1.7	Tons Metal Charged	248
49	3-04-003-03	- Electric Induction Furnace	0.86	Tons Metal Charged	249
49	3-04-003-15	- Charge Handling	0.36	Tons Metal Charged	250
49	3-04-003-20	- Pouring/Casting	2.8	Tons Metal Charged	251
49	3-04-003-25	- Casting Cooling	1.4	Tons Metal Charged	252
49	3-04-003-40	- Casting Grinding/Cleaning	1.7	Tons Metal Charged	253
49	3-04-003-50	- Sand Grinding/Handling	0.54	Tons Sand Handled	254
49	3-04-003-51	- Core Ovens	2.22	Tons Sand Handled	255
49	3-04-003-52	- Sand Grinding/Handling	6.0	Tons Metal Charged	256
49	3-04-003-53	- Core Ovens	0.90	Tons Metal Charged	257
49	3-04-003-60	- Castings Finishing	0.0045	Tons Metal Charged	258
50	<u>Secondary Lead Smelting - 3341, 3369</u>				
50	3-04-004-01	- Pot Furnace	0.2	Tons Metal Charged	259
50	3-04-004-02	- Reverberatory Furnace	194	Tons Metal Charged	260
50	3-04-004-03	- Blast Furnace (Cupola)	129	Tons Metal Charged	261
50	3-04-004-04	- Rotary Sweating Furnace	64	Tons Metal Charged	262

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
50	3-04-004-05	- Reverberatory Sweating Furnace	31	Tons Metal Charged	263
50	3-04-004-08	- Barton Process Reactor (Oxidation Kettle)	40.0	Tons Lead Oxide Produced	264
50	3-04-004-09	- Casting	0.87	Tons of Lead Cast	265
50	3-04-004-12	- Sweating Furnace: Fugitive	2.35	Tons Metal Charged	266
50	3-04-004-13	- Smelting Furnace: Fugitive	10.0	Tons Metal Charged	267
50	3-04-004-14	- Kettle Refining: Fugitive	0.002	Tons Metal Charged	268
50	<u>Lead Battery Manufacture - 3691</u>				
50	3-04-005-05	- Overall Process	125	10 ³ Batteries Produced	269
50	3-04-005-07	- Paste Mixing	3.92	10 ³ Batteries Produced	270
50	3-04-005-10	- Lead Reclaiming Furnace	1.67	10 ³ Batteries Produced	271
50	3-04-005-11	- Small Parts Casting	0.19	10 ³ Batteries Produced	272
50	3-04-005-12	- Formation	32.4	10 ³ Batteries Produced	273
51	<u>Steel Foundry - 3324, 3325</u>				
51	3-04-007-03	- Open Hearth Furnace with Oxygen Lance	8.5	Tons Metal Processed	274
51	3-04-007-05	- Electric Induction Furnace	0.09	Tons Metal Processed	275
51	3-04-007-06	- Sand Grinding/ Handling in Mold and Core Making	0.54	Tons Sand Processed	276
51	3-04-007-07	- Core Ovens	2.22	Tons Sand Processed	277

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
51	3-04-007-08	- Pouring and Casting	5.40 2.8	Tons Metal Processed	278
51	3-04-007-11	- Castings Cleaning	1.7	Tons Metal Processed	279
51	3-04-007-12	- Charge Handling	0.36	Tons Metal Processed	280
51	3-04-007-13	- Casting Cooling	10.40 1.4	Tons Metal Processed	281
51	3-04-007-15	- Finishing: Specify in Comments	0.0045	Tons Metal Processed	282
51	3-04-007-16	- Sand Grinding and Handling	6.0	Tons Metal Processed	283
51	3-04-007-17	- Core Ovens	0.90	Tons Metal Processed	284
53	<u>Lead Cable Coating - 3357, 3315</u>				
	3-04-040-01	- General	0.36	Tons Lead Processed	285

MINERAL PRODUCTS - MAJOR GROUPS 11, 12, 14, 28, 29, 32, 44

	<u>Asphalt Roofing Manufacture - 2952</u>				
54	3-05-001-01	- Asphalt Blowing: Saturant	6.8	Tons Asphalt Processed	286
54	3-05-001-02	- Asphalt Blowing: Coating	25.0	Tons Asphalt Processed	287
54	3-05-001-03	- Felt Saturation: Dipping Only	0.5	Tons Asphalt Shingle	288
54	3-05-001-04	- Felt Saturation: Dipping/Spraying	2.26	Tons Asphalt Shingle	289
	<u>Asphaltic Concrete - 2951</u>				
54	3-05-002-02	- Hot Elevators, Screens, Bins & Mixer	0.03	Tons Produced	290
54	3-05-002-03	- Storage Piles	0.12	Tons Produced	291

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
54	3-05-002-04	Cold Aggregate Handling	0.04	Tons Produced	292a
54	3-05-002-11	Rotary Dryer - Conventional Plant, w/cyclone	0.36	Tons Produced	292b
55	<u>Brick Manufacturing - 3251</u>				
55	3-05-003-01	Raw Material Drying	41.7 35.7	Tons Raw Material	293
55	3-05-003-03	Storage of Raw Materials	12.0	Tons Material Stored	294
55	3-05-003-08	Screening	1.4	Tons Raw Material	295
55	3-05-003-11	Curing and Firing: Gas-Fired	0.01	Tons Produced	296
55	3-05-003-12	Curing and Firing: Oil-Fired Tunnel Kilns	0.32	Tons Brick Produced	297
55	3-05-003-14	Curing and Firing: Gas-Fired Periodic Kilns	0.034	Tons Produced	298
55	3-05-003-15	Curing and Firing: Oil-Fired Periodic Kilns	0.47	Tons Produced	299
55	3-05-003-16	Curing and Firing: Coal-Fired Periodic Kilns	10.0	Tons Produced	300
55	<u>Calcium Carbide - 2819</u>				
55	3-05-004-01	Electric Furnace (Hoods & Main Stack)	22.0	Tons Produced	301
55	3-05-004-02	Coke Dryer	1.0	Tons Produced	302
55	3-05-004-03	Furnace Room Vents	24.0	Tons Produced	303
55	<u>Castable Refractory - 3255</u>				
55	3-05-005-05	Molding and Shakeout	20.0	Tons Feed Material	304

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>Cement Manufacturing - Dry Process - 3241</u>					
56		3-05-006-07 - Raw Material Unloading	0.1	Tons Material	305
56		3-05-006-08 - Raw Material Piles	1.4	Tons in Piles	306
56		3-05-006-09 - Primary Crushing	0.26	Tons Processed	307
56		3-05-006-10 - Secondary Crushing	1.13	Tons Processed	308
56		3-05-006-12 - Raw Material Transfer	0.15	Tons Handled	309
56		3-05-006-19 - Cement Load Out	0.20	Tons Cement Produced	310
<u>Wet Process - 3241</u>					
56		3-05-007-07 - Raw Material Unloading	0.1	Tons of Material Unloaded	311
56		3-05-007-08 - Raw Material Piles	1.4	Tons in Piles	312
56		3-05-007-09 - Primary Crushing	0.26	Tons Processed	313
56		3-05-007-10 - Secondary Crushing	1.13	Tons Processed	314
56		3-05-007-12 - Raw Material Transfer	0.15	Tons Handled	315
56		3-05-007-19 - Cement Loadout	0.20	Tons Cement Produced	316
<u>Clay and Fly Ash Sintering (Low Density Aggregate Manufacture) - 3295</u>					
56		3-05-009-03 - Natural Clay/ Shale Sintering	6.12	Tons Finished Product	317
56		3-05-009-04 - Raw Clay/Shale Crushing/Screening	0.25	Tons Raw Material	318
56		3-05-009-05 - Raw Clay/Shale Transfer/Conveying	0.40	Tons Raw Material	319

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>Surface Mining Operations - 1111, 1211</u>					
57	3-05-010-21	Overburden Removal	—	Tons Coal Mined	320
57	3-05-010-22	Drilling/Blasting	—	Tons Coal Mined	321
57	3-05-010-23	Loading	0.05	Tons Coal Mined	322
57	3-05-010-30	Topsoil Removal	—	Tons Topsoil Removed	323
57	3-05-010-33	Overburden: Drilling	0.16	Holes Drilled	324
57	3-05-010-34	Coal Seam: Drilling	0.028	Holes Drilled	325
57	3-05-010-37	Truck Loading: Overburden	0.015	Tons Overburden Loaded	326
58	3-05-010-42	Truck Unloading: Bottom Dump- Overburden	0.001	Tons Overburden	327
58	3-05-010-43	Open Storage Pile: Coal	17,060	Acres Coal Storage Area	328
58	3-05-010-48	Overburden Replacement	0.006	Tons Overburden	329
58	3-05-010-49	Wind Erosion: Exposed Areas	380	Acres Exposed Area	330
<u>Concrete Batching - Fugitive Emissions - 3271, 3272, 3273, 3275, 1771, 3292</u>					
59	3-05-011-20	Asbestos/Cement Products	0.1	Tons Produced	331
<u>Wool-Type Glass Fiber - 3296</u>					
59	3-05-012-01	Regenerative Furnace	20.7	Tons Material Processed	332
59	3-05-012-02	Recuperative Furnace	25.9	Tons Material Processed	333

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
59	3-05-012-03	- Electric Furnace	0.47	Tons Material Processed	334
59	3-05-012-04	- Forming (Rotary Spun)	—	Tons Material Processed	335
59	3-05-012-05	- Curing Oven (Rotary Spun)	9.0	Tons Material Processed	336
59	3-05-012-06	- Cooling	1.3	Tons Material Processed	337
59	3-05-012-07	- Unit Melter Furnace	8.6	Tons Material Processed	338
59	3-05-012-08	- Forming (Flame Attenuation)	—	Tons Material Processed	339
59	3-05-012-09	- Curing (Flame Attenuation)	6.0	Tons Material Processed	340
<u>Textile-Type Glass Fiber - 3229</u>					
59	3-05-012-11	- Regenerative Furnace	15.0	Tons Material Processed	341
59	3-05-012-12	- Recuperative Furnace	1.9	Tons Material Processed	342
59	3-05-012-13	- Unit Melter Furnace	5.7	Tons Material Processed	343
59	3-05-012-14	- Forming Process	—	Tons Material Processed	344
59	3-05-012-15	- Curing Oven	1.2	Tons Material Processed	345
<u>Frit Manufacture - 2899</u>					
59	3-05-013-01	- Rotary Furnace	15.0	Tons Charged	346
<u>Glass Manufacture - 3211, 3221, 3229</u>					
59	3-05-014-03	- Flat Glass: Melting Furnace	1.9	Tons Glass Produced	347
59	3-05-014-04	- Pressed and Blown Glass: Melting Furnace	16.5	Tons Glass Produced	348

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
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		<u>Gypsum Manufacture - 3275</u>			
60		3-05-015-04 - Conveying	0.15	Tons Throughput	349
60		3-05-015-05 - Primary Crushing: Gypsum Ore	0.26	Tons Crude Gypsum	350
60		3-05-015-06 - Secondary Crushing: Gypsum Ore	1.13	Tons Crude Gypsum	351
60		3-05-015-21 - End Sawing (8 Ft)	6.80	10 ³ Sq. Ft. Board Sawed	352
60		3-05-015-22 - End Sawing (12 Ft)	4.25	10 ³ Sq. Ft. Board Sawed	353
		<u>Lime Manufacture - 3274</u>			
60		3-05-016-01 - Primary Crushing	0.26	Tons Limestone Processed	354
60		3-05-016-02 - Secondary Crushing/Screening	1.13	Tons Limestone Processed	355
60		3-05-016-03 - Calcining- Vertical Kiln ^{dd}	5.00	Tons Lime Produced	356
60		3-05-016-05 - Calcimatic Kiln ^{dd}	31.5	Tons Lime Produced	357
60		3-05-016-07 - Raw Material Transfer and Conveying	0.18	Tons Limestone Processed	358
60		3-05-016-08 - Raw Material Unloading	0.1	Tons Limestone Processed	359
60		3-05-016-09 - Hydrator (Atmospheric)	0.07	Tons Hydrated Lime	360
60		3-05-016-10 - Raw Material Storage Piles	1.4	Tons Limestone Processed	361
61		3-05-016-11 - Product Cooler	25.2	Tons Lime Produced	362
61		3-05-016-12 - Pressure Hydrator	0.07	Tons Hydrated Lime Produced	363

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
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61	<u>Phosphate Rock - 1475</u> 3-05-019-04 - Open Storage	14.4	Tons Phosphate Rock	364
61	<u>Stone Quarrying/Processing - 1411, 1422, 1423, 1429, 1499</u> 3-05-020-06 - Miscellaneous Operation-Screen/Convey/ Handling	—	Tons Raw Material	365
61	3-05-020-07 - Open Storage	0.12	Tons Product Stored	366
61	3-05-020-09 - Blasting - General	—	Tons Raw Material	367
61	3-05-020-12 - Drying	5.0	Tons Stone Dried	368
62	<u>Sand/Gravel - 1442, 1446</u> 3-05-025-02 - Aggregate Storage	0.12	Tons Product	369
62	3-05-025-03 - Material Transfer & Conveying	0.0064	Tons Product	370
62	3-05-025-07 - Storage Piles	1,367.0	Acres of Storage Area	371

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66	<u>Petroleum Process Heaters 2911</u> 3-06-001-03 - Oil Fired	7.4 S	10 ³ Gallons Oil Burned	372
66	3-06-001-04 - Gas Fired	3.0	10 ⁶ Cubic Feet Burned	373
66	3-06-001-05 - Natural Gas- Fired	3.0	10 ⁶ Cubic Feet Burned	374
66	3-06-001-06 - Process Gas- Fired	3.0	10 ⁶ Cubic Feet Burned	375
66	3-06-001-07 - LPG Fired	0.27	10 ³ Gallons Burned	376

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
<u>Fluid Catalytic Cracking Units (FCC) - 2911</u>					
66	3-06-002-01	Fluid Catalytic Cracking Unit	169.4	10 ³ BBLs. Fresh Feed	377
66	3-06-003-01	Thermal Catalytic Cracking Unit	11.9	10 ³ BBLs. Fresh Feed	378
<u>Fluid Coking Units - 2911</u>					
68	3-06-012-01	Fluid Coking Units	366.0	10 ³ BBLs. Fresh Feed	379
<u>Sulfate (Kraft) Pulping - 2611, 2621, 2631 (For Bark Boilers, See Industrial Boilers)</u>					
69	3-07-001-08	Fluid Bed Calciner	50.4	Air-Dry Tons Unbleached Pulp	380
69	3-07-001-10	Recovery Furnace/Indirect Contact Evaporator	230.0	Air-Dry Tons Unbleached Pulp	381
<u>Pulpboard Manufacture - 2631, 2661</u>					
69	3-07-004-02	Fiberboard: General	0.35	Tons Finished Product	382
<u>Plywood/Particleboard Operations - 2435, 2436, 2492</u>					
70	3-07-007-01	General: Not Classified	2.47	10 ⁴ Sq. Ft. 3/8" Plywood	383
70	3-07-007-03	Particleboard Drying	0.35	Tons Processed	384
70	3-07-007-04	Waferboard Dryer	498.0	10 ⁴ LBs. Waf/Chips Dried	385
70	3-07-007-11	Fir-Sapwood-Steam Fired	2.69	10 ⁴ Sq. Ft. 3/8" Plywood	386
70	3-07-007-12	Fir-Sapwood-Gas-Fired	1.37	10 ⁴ Sq. Ft. 3/8" Plywood	387
70	3-07-007-13	Fir-Heartwood Plywood Veneer dryer	1.84	10 ⁴ Sq. Ft. 3/8" Plywood	388
70	3-07-007-14	Larch Plywood Veneer dryer	2.40	10 ⁴ Sq. Ft. 3/8" Plywood	389

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
70	3-07-007-15	Southern Pine Plywood Veneer dryer	2.15	10 ⁴ Sq. Ft. 3/8" Plywood	390
70	<u>Sawmill Operations - 2421, 2426, 2429</u>				
70	3-07-008-01	Log Debarking	0.011	Tons of Logs Processed	391
70	3-07-008-02	Log Sawing	0.20	Tons of Logs Processed	392
70	3-07-008-03	Sawdust Pile Handling	0.36	Tons of Sawdust	393
70	3-07-008-04	Sawing: Cyclone Exhaust	0.90	SCFM Average Airflow	394
70	3-07-008-05	Planing/Trimming: Cyclone Exhaust	0.90	SCFM Average Airflow	395
70	3-07-008-06	Sanding: Cyclone Exhaust	2.00	SCFM Average Airflow	396
70	3-07-008-07	Sanderdust: Cyclone Exhaust	2.50	Hours of Operation	397
70	3-07-008-08	Other Cyclones: Exhaust	0.80	Hours of Operation	398
	<u>Miscellaneous Woodworking Operations - 2421, 2426, 2429, 2431, 2434, 2439</u>				
71	3-07-030-01	Wood Waste Storage Bin Vent	0.58	Tons Wood Waste	399
71	3-07-030-02	Wood Waste Storage Bin Loadout	1.20	Tons Wood Waste	400
74	<u>Drum Cleaning/Reclamation - 5085</u>				
74	3-09-025-01	Drum Burning Furnace	0.02	Drums Burned	401
	<u>Oil & Gas Production - Fuel Fired Equipment</u>				
	<u>Process Heaters</u>				
76	3-10-004-01	Distillate Oil	1.0	10 ³ Gal. Burned	402

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
76	3-10-004-02	- Residual Oil	10.3S	10 ³ Gal. Burned	403
76	3-10-004-03	- Crude Oil	10.3S	10 ³ Gal. Burned	404
76	3-10-004-04	- Natural Gas	3.0	10 ⁶ Cu. Ft. Burned	405
76	3-10-004-05	- Process Gas	3.0	10 ⁶ Cu. Ft. Burned	406
<u>Steam Generators</u>					
76	3-10-004-11	- Distillate Oil	1.0	10 ³ Gal. Burned	407
76	3-10-004-12	- Residual Oil	10.3S	10 ³ Gal. Burned	408
76	3-10-004-13	- Crude Oil	10.3S	10 ³ Gal. Burned	409
76	3-10-004-14	- Natural Gas	3.0	10 ⁶ Cu. Ft. Burned	410
76	3-10-004-15	- Process Gas	3.0	10 ⁶ Cu. Ft. Burned	411
<u>Typesetting (Lead Remelting) - 2791</u>					
79	3-60-001-01	- Remelting (Lead Emissions Only)	0.18	Tons Melted	412
<u>Surface Coating of Automobiles and Light Trucks - 3711, 3713</u>					
85	4-02-016-01	- Prime Application, Electrodeposition/Dip/Spray	6.40	Tons Solvent in Coating	413
<u>SOLID WASTE DISPOSAL GOVERNMENT</u>					
<u>Other Incineration</u>					
106	5-01-005-05	- Pathological	5.92	Tons Burned	414
106	5-01-005-07	- Conical Design (Tee Pee) Municipal Refuse	11.0	Tons Burned	415
106	5-01-005-08	- Conical Design (Tee Pee) Wood Refuse	3.85	Tons Burned	416
106	5-01-005-10	- Trench Burner: Wood	4.94	Tons Burned	417
106	5-01-005-11	- Trench Burner: Tires	52.4	Tons Burned	418

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
106	5-01-005-12 - Trench Burner: Refuse		14.1	Tons Burned	419
<u>SOLID WASTE DISPOSAL - COMMERCIAL/INSTITUTIONAL</u>					
	<u>Incineration - General</u>				
107	5-02-001-01 - Multiple Chamber		4.70	Tons Burned	420
107	5-02-001-02 - Single Chamber		5.70	Tons Burned	421
107	5-02-001-03 - Controlled Air		1.04	Tons Burned	422
107	5-02-001-04 - Conical Design: Municipal Refuse		11.0	Tons Burned	423
107	5-02-001-05 - Conical Design: Wood Refuse		3.85	Tons Burned	424
	<u>Apartment Incineration</u>				
107	5-02-003-01 - Flue Fed		11.4	Tons Burned	425
107	5-02-003-02 - Flue Fed (With Afterburner and Draft Controls)		4.02	Tons Burned	426
	<u>Incineration (Special Purpose)</u>				
107	5-02-005-05 - Pathological Waste		5.92	Tons Burned	427
<u>SOLID WASTE DISPOSAL - INDUSTRIAL</u>					
	<u>Incineration</u>				
107	5-03-001-01 - Multiple Chamber		4.70	Tons Burned	428
107	5-03-001-02 - Single Chamber		5.70	Tons Burned	429
107	5-03-001-03 - Controlled Air		1.04	Tons Burned	430
107	5-03-001-04 - Conical Design: Refuse		11.0	Tons Burned	431
107	5-03-001-05 - Conical Design: Wood Refuse		3.85	Tons Burned	432

Page Number	SCC	Process	PM ₁₀ Factor lbs/unit	Units	Reference Number
107	5-03-001-06	- Trench Burner: Wood	4.94	Tons Burned	433
108	5-03-001-07	- Trench Burner: Tires	52.4	Tons Burned	434
108	5-03-001-08	- Auto Body Components	1.2	Tons Burned	435
108	5-03-001-09	- Trench Burner: Refuse	14.1	Tons Burned	436
108	<u>Opening Burning</u> 5-03-002-04	- Coal Refuse Piles ^d	0.48 0.9	Cu. Yds. of Pile	437

APPENDIX

PM₁₀ EMISSION FACTOR DOCUMENTATION

Documentation

AIRS SOURCE CLASSIFICATION CODES AND
PM₁₀ EMISSION FACTOR LISTING BY
TECHNOLOGY TRANSFER

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor^a</u>	<u>Basis for PM10 Derivation</u>
1.	1-01-002-17	-	No basis for technology transfer.
2.	1-01-007-01	3.0	As stated in AP-42, Section 1.4, all PM from natural gas combustion is < 1 um; assume 100% PM ≤ 10 um.
3.	1-01-007-02	3.0	Same as Ref. #2, 1-01-007-01.
4.	1-01-008-01	10.0A	Use AP-42, Appendix C.2, Category 2, which shows, on average, 79% of PM is ≤ 10 um.
5.	1-01-010-01	0.28	As stated in Section 1.4, AP42, all PM from NG combustion is less than 1 um; assume same for LPG.
6.	1-01-010-02	0.26	Same as Ref. #5, 1-01-010-01.
7.	1-01-011-01	16.0	Assume bagasse combustion is similar to wood bark, for which AP42, Table 1.6-2 reports 35% of PM ≤ 10 um.
8.	1-01-013-02	19.0	Fine Particle Emissions Information System (FPEIS) Reports 205 & 207 give data on crude oil fired industrial boilers, showing 66% of PM ≤ 10 um.
9.	1-02-001-07	10.0	Per Section 1.2, AP42, use data for traveling grate stoker; Table 1.2-4 states 52% PM ≤ 10 um.
10.	1-02-007-01	3.0	Same as Ref. #5, SCC 1-01-010-01.

^aUnless otherwise noted, particulate matter (PM) factors are taken from Criteria Pollutant Emission Factors for the 1985 NAPAP Emissions Inventory, EPA/600/7-87/015, May 1987. Many of these factors are published in USEPA's Compilation of Air Pollutant Emission Factors, AP-42.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
11.	1-02-008-02	7.0A	Same as Ref. #4, SCC 1-01-008-01.
12.	1-02-008-04	7.0A	Same as Ref. #4, SCC 1-01-008-01.
13.	1-02-009-03	8.8	Use $90\% \leq 10 \text{ um}$, per footnote C, Table 1.6-3, AP42.
14.	1-02-009-06	8.8	Same as Ref. #13, SCC 1-02-009-03.
15.	1-02-010-01	0.28	Assume particle size distribution (psd) is same as NG: $100\% \leq 10 \text{ um}$
16.	1-02-010-02	0.26	Same as Ref. #15, SCC 1-02-010-01
17.	1-02-011-01	16.0	Same as Ref #7, SCC 1-01-011-01
18.	1-02-014-01	3.0	Same as Ref. #2, 1-01-007-01
19.	1-02-014-02	3.0	Same as Ref. #18, 1-02-014-01
20.	1-03-001-03	10.0	Same as Ref. #9, SCC 1-02-001-07
21.	1-03-002-14	15.0	Assume bituminous coal similar to anthracite; psd same as Ref. #9, SCC 1-02-001-07
22.	1-03-009-03	8.8	Same as Ref. #13, SCC 1-02-009-03
23.	1-03-010-01	0.28	Same as Ref. #15, SCC 1-02-010-01
24.	1-03-010-02	0.26	Same as Ref. #16, SCC 1-02-010-02
25.	1-05-001-05	2.50	Assume psd is same as for industrial boilers, AP42, Table 1.6-3; 50% 98.5% $\leq 10 \text{ um}$. <i>PHS, 10/62</i>
26.	1-05-001-06	3.0	Same as Ref. #5, SCC 1-01-010-01
27.	1-05-001-10	1.85	Assume psd from LPG combustion is same as NG; Ref. #5, SCC 1-01-010-01

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
28.	1-05-002-05	2.50	Assume same as Ref. #25, SCC 1-05001-05
29.	1-05-002-06	3.0	Assume same as Ref. #27, SCC 1-05001-10
30.	1-05-002-09	25.0	AP-42 Section 1.10 notes that 95% of wood smoke particles are less than 0.4 um. Assume 100% ≤10 um.
31.	1-05-002-10	1.85	Same as Ref. #18, SCC 1-02-014-01
32.	2-01-001-01	5.0	From AP-42, App. C.2, Table C.2-2, use 96% ≤ 10 um.
33.	2-01-001-02	33.5	From AP-42, App. C.2 Table C.2-2, use 96% ≤ 10 um.
34.	2-01-002-01	14.0	Same as Ref. #5, SCC 1-01-010-01
35.	2-01-002-02	10.0	Same as Ref. #5, SCC 1-01-010-01
36.	2-01-009-01	5.0	From App. C.2, Category 1, 96% ≤ 10 um.
37.	2-01-009-02	33.5	Same as Ref. #36, SCC 2-01-009-01
38.	2-02-001-01	5.0	Same as Ref. #32, SCC 2-01-001-01
39.	2-02-001-02	33.5	Same as Ref. #33, SCC 2-01-001-02
40.	2-02-001-03	5.0	Same as Ref. #32, SCC 2-01-001-01
41.	2-02-001-04	33.5	Same as Ref. #33, SCC 2-01-001-02
42.	2-02-002-01	14.0	Same as Ref. #5, SCC 1-01-010-01
43.	2-02-002-02	10.0	Same as Ref. #5, SCC 1-01-010-01
44.	2-02-002-03	14.0	Same as Ref. #5, SCC 1-01-010-01

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
45.	2-02-002-04	10.0	Same as Ref. #5, SCC 1-01-010-01
46.	2-02-003-01	6.47	From AP-42, Table C.2-2, Category 1, assume 96% \leq 10 μ m.
47.	2-02-004-01	50.0	Assume 92% \leq 10 μ m, per Table C.2-2, since large bore may tend toward less efficient combustion, producing more large particles.
48.	2-02-004-02	2.2	Same as Ref. #47, SCC 2-02-004-01
49.	2-02-004-03	0.035	Same as Ref. #47, SCC 2-02-004-01
50.	2-02-005-01	33.5	Same as Ref. #47, SCC 2-02-004-01
51.	2-02-009-01	5.0	Same as Ref. #47
52.	2-02-009-02	33.5	Same as Ref. #36
53.	2-02-010-01	5.0	Same as Ref. #5, SCC 1-01-010-01
54.	2-02-010-02	5.0	Same as Ref. #5, SCC 1-01-010-01
55.	2-03-001-01	33.5	Same as Ref. #33, SCC 2-01-001-02
56.	2-03-001-02	5.0	Same as Ref. #32, 2-01-001-01
57.	2-03-002-01	10.0	Same as Ref. #5, SCC 1-01-010-01
58.	2-03-002-02	14.0	Same as Ref. #5, SCC 1-01-010-01
59.	2-03-003-01	6.47	From AP42, C.2-2, Category 1, assume psd = 96% \leq 10 μ m
60.	2-03-010-01	5.0	Same as Ref. #5, SCC 1-01-010-01
61.	2-03-010-02	5.0	Same as Ref. #5, SCC 1-01-010-01

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
62.	2-04-001-01	11.8	Assume jet engine testing (firing jet fuel) same as Ref. #36, SCC 2-01-009-01, Turbine (96% \leq 10 μ m)
63.	2-04-001-02	11.8	Same as Ref. #36, SCC 2-01-009-01
64.	2-04-003-01	14.0	Same as Ref. #2, SCC 1-01-007-01
65.	2-04-003-02	5.0	From AP-42, Appendix C.2-2, Category 1, 96% \leq 10 μ m.
66.	2-04-004-01	6.47	Same as Ref. #46, SCC 2-02-003-01
67.	2-04-004-02	33.5	Same as Ref. #65, SCC 2-04-004-02
68.	3-01-001-01	0.9	Assume psd is similar to that of potassium chloride drying, without controls, as given in AP-42, App C.1-28; 4.07% \leq 10 μ m
69.	3-01-001-05	0.1	Same as #68
70.	3-01-001-06	0.8	Same as #68
71.	3-01-003-06	0.144	Assume pm emissions are from NG combustion; psd same as Ref. #46, SCC 2-02-003-01
72.	3-01-003-07	0.9	Assume pm from oil firing, same as Ref. # 46; 96% \leq 10 μ m.
73.	3-01-005-01	2300.0	No plants.
74.	3-01-005-03	3.2	Assume 100% of pm \leq 10 μ m; AP-42, Section 5.3 states that all pm is between 10-500 nm
75.	3-01-005-04	6.53	Same as #74
76.	3-01-005-06	0.58	Same as #74
77.	3-01-005-07	0.45	Same as #74
78.	3-01-005-08	0.06	Same as #74
79.	3-01-005-09	0.2	Same as #74

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
80.	3-01-006-03	266.0	Assume psd similar to coke mfg.: from AP-42, Table 7.2-2; for combustion stack, uncon., 96% ≤ 10 um.
81.	3-01-006-04	266.0	Same as Ref. #80, SCC 3-01-006-03
82.	3-01-006-05	56.0	Assume psd similar to coke pushing, AP-42, Table 7.2-2; 43% ≤ 10 um
83.	3-01-010-15	25.0	Assume same as recovery boiler in pulp mill; 94% ≤ 10 um
84.	3-01-010-23	0.25	Same as Ref. #83, SCC 3-01-010-15
85.	3-01-010-30	180.0	No basis for technology transfer
86.	3-01-017-03	2.14	AP42, Section 5.11, Table 2.2 notes that acid mist particle size is 0.4 - 2.6 um. Assume all large particles are absorbed, and 100% of particles uncontrolled are ≤ 10 um.
87.	3-01-017-04	2.53	Same as Ref. #86, SCC 3-01-017-03
88.	3-01-017-05	0.69	Same as Ref. #86, SCC 3-01-017-03
89.	3-01-017-06	5.46	Same as Ref. #86, SCC 3-01-017-03
90.	3-01-017-07	0.11	Same as Ref. #86, SCC 3-01-017-03
91.	3-01-017-08	1.66	Same as Ref. #86, SCC 3-01-017-03
92.	3-01-018-01	35.0	PM emissions from plastics mfg. generally occur during drying and post processing. Assume similar to detergent spray drying AP-42, Table 5.15-2: 66.1% ≤ 10 um.
93.	3-01-018-02	3.0	Same as Ref. #92, SCC 3-01-018-01

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
94.	3-01-019-02	13.0	From AP-42, Appendix C-2 Category 9; 94% \leq 10 μ m.
95.	3-01-019-06	5.0	Same as Ref. #94, SCC 3-01-018-02
96.	3-01-020-05	2.0	No basis for technology transfer
97.	3-01-021-02	50.0	Assume psd similar to rotary drying of sodium carbonate, AP- 42, Table 5-16-3; 21% \leq 10 μ m
98a.	3-01-021-06	84.0	From AP-42, Section 5.16, Table 5.16-3: 21% \leq 10 μ m
98b.	3-01-021-14*	67.0	Same as Ref. #98a.
99.	3-01-027-04	4.35	Mostly fume; assume 100% \leq 10 μ m, by engineering judgement.
100.	3-01-027-08	2.68	Assume pan granulator is similar to rotary-drum granulator; AP-42, Table 6.8-2; 2% \leq 10 μ m.
101.	3-01-027-09	0.02	No basis for technology transfer.
102.	3-01-027-10	0.19	No basis for technology transfer.
103.	3-01-027-11	4.35	Same as Ref. #99, SCC 3-01-027-04
104.	3-01-027-12	3.18	Use prilling from AP-42, Appendix C.2-2, Category 9; 94% \leq 10 μ m.
105.	3-01-027-14	1.6	From AP-42, Table 6.8-2, assume low density prill cooler is same as high density: 0.4% \leq μ m.
106.	3-01-027-17	0.52	Same as Ref. #104, SCC 3-01-027-12
107.	3-01-027-18	4.0	From AP-42, App. C.2-2, Category 4, 85% \leq 10 μ m
108.	3-01-027-21	4.35	Same as Ref. #99, SCC 3-01-027-04
109.	3-01-027-27	0.52	Same as Ref. #104, SCC 3-01-027-12

*(New Code) Rotary Dryer - Steam Tube

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
110.	3-01-027-28	4.0	Same as Ref. #107, SCC 3-01-027-18
111.	3-01-035-01	230.0	Assume psd similar to lime calcination; AP-42, Table 8.15- 2, where 12% \leq 10 μ m.
112.	3-01-035-06	0.64	100% of lead oxide emissions are generally \leq 10 μ m, as presented in AP-42, App. C.1, Section 7.15.
113.	3-01-035-07	15.0	Same as Ref. #112, SCC 3-01-035-06
114.	3-01-035-10	1.0	Same as Ref. #112, SCC 3-01-035-06
115.	3-01-035-15	0.69	Same as Ref. #112, SCC 3-01-035-06
116.	3-01-035-20	0.20	No basis for technology transfer
117.	3-01-035-51	8.0	Assume principal pigment ore dried is lead, and psd is same as for storage, AP-42, Section 7.8; 86% \leq 10 μ m.
118.	3-01-040-02	0.021	Assume similar to sodium carbonate pre-dryer with controls, AP-42, Table 5.16-3; 52.5% \leq 10 μ m.
119.	3-01-040-03	3.8	Assume psd is as given in AP-42, Appendix C.2, Category 9; 94% \leq 10 μ m.
120.	3-01-040-04	241.0	Same as Ref. #100, SCC 3-01-027-08
121.	3-01-040-05	4.0*	Same as Ref. #107, SCC 3-01-027-18
122.	3-01-040-06	0.19	Same as Ref. #101, SCC 3-01-027-09
123.	3-01-040-07	0.02	Same as Ref. #101, SCC 3-01-027-09
124.	3-01-042-01	59.3**	Lead Oxide (PbO) fume, assumed to be 100% PM ₁₀ , by engineering judgement.
125.	3-01-042-04	1.9	No basis for technology transfer

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
126.	3-01-130-05	218.0	Assume psd is same as sodium carbonate fluidized bed dryer, AP-42, Table 5.16-3; 10%, ≤ 10 um.
127.	3-02-003-01	1.4	Same as Ref. #92, SCC 3-01-018-01
128.	3-02-004-01	5.0	No basis for technology transfer
129.	3-02-004-02	0.3	No basis for technology transfer
130.	3-02-004-03	0.2	No basis for technology transfer
131.	3-02-004-04	1.5	No basis for technology transfer
132.	3-02-004-10	7.0	No basis for technology transfer
133.	3-02-006-08	1.5	PSD for grain handling in AP-42, App. C.2, Cat. 6 is used: 15% ≤ 10 um.
134.	3-02-006-11	4.65	Same as Ref. #133, SCC 3-02-006-08
135.	3-02-007-24	70.0	From AP-42, App. C.2, Category 7, 61% ≤ 10 um.
136.	3-02-007-34	70.0	Same as Ref. # 135, SCC 3-02-007-24
137.	3-02-012-05	5.0	Assume psd for steam tube dryers is same as for rotary steam tube dryer for sodium carbonate, AP-42, Table 5.16-3; 21% ≤ 10 um.
138.	3-02-012-06	8.0	Same as Ref. #137, SCC 3-02-012-05
139.	3-03-000-02	1.2	AP42, Section 7.1 suggests that psd for miscellaneous fugitive operations is similar to that presented in Table 7.1-3, which shows 58% ≤ 10 um.

*PM factor from AP-42, Ammonium Nitrate, Table 6.8-1

**The Recovery Furnace emissions are PbO fume. The lead emission factor in AP-42, 55 lb (as Pb) was erroneously converted to PbO₂, and incorrectly entered into EPA600/7-87-015 as 63.5 lb/ton.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
140.	3-03-001-01	94.0	Assume psd for prebake cell is same as that of fugitives, Ref. 139; 58% \leq 10 μ m.
141.	3-03-001-04	10.0	AP42 - Section 7.1 suggests that psd for fugitives are as shown in Table 7.1-3; 58% \leq 10 μ m.
142.	3-03-001-10	12.0	Assume psd from VSS fugitives is same as for HSS, AP-42, Table 7.1-4; 31% \leq 10 μ m.
143.	3-03-002-01	200.0	Same as Ref. #111, SCC 3-01-035-01
144.	3-03-003-08	0.51	From AP-42, App. C.2, Category 9, 94% \leq 10 μ m.
145.	3-03-003-10	0.11	Assume psd for coal crushing is same as for coal charging, AP-42, Table 7.2-2; 48.9% \leq 10 μ m.
146.	3-03-003-12	0.09	No basis for technology transfer. As default value, assume same as coal crushing; 48.9% \leq 10 μ m.
147.	3-03-003-14	0.09	Same as Ref. #144, SCC 3-03-003-08
148.	3-03-004-01	200.0	No basis for technology transfer. As default value, use psd for coal charging, AP-42, Table 7.2-2; 48.9% \leq 10 μ m.
149.	3-03-005-02	45.0	Use AP42, Appendix C.2, Category 5; 53% \leq 10 μ m.
150.	3-03-005-05	10.0	Use AP-42, Appendix C.2-2, Cat.8; 92% \leq 10 μ m.
151.	3-03-005-06	10.0	As default value, assume psd similar to Fluorspar drum dryer, AP-42, App. C.1, C.1-94; 48% \leq 10 μ m.
152a.	3-03-005-07	50.0	From AP-42, Table 7.3-4, 27% \leq 10 μ m.
152b.	3-03-005-09	55.0	Same as Ref. # 149; 53% \leq 10 μ m.
153.	3-03-005-10	100.0	Assume similar to EAF in steel refining, AP-42, Table 7.5-2; 58% \leq 10 μ m.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
154.	3-03-005-12	140.0	Flash furnace combines roasting and smelting. Use AP42, converter, Table 7.3-5; 59% \leq 10 μ m.
155.	3-03-005-13	2.6	Assume psd of fugitives from roasting are similar to roasting, Ref. # 149; 53% \leq 10 μ m.
156.	3-03-005-14	0.4	Assume psd of fugitives from reverberatory furnace are average from matte tapping (Table 7.3-7) slag tapping (Table 7.3-8) and smelter (Table 7.3-4); $\frac{74 + 28 + 27}{3} = 43\% \leq 10 \mu\text{m}$.
157.	3-03-005-15	4.4	Same as Ref. #154, SCC 3-03-005-12
158.	3-03-005-16	0.5	Same as Ref. #150, SCC 3-03-005-05
159.	3-03-005-17	8.0	No basis for technology transfer. As default value, use psd for fugitive emissions from converter slag and copper blow, AP42, Table 7.3-9; 96% \leq 10 μ m.
160.	3-03-005-22	10.0	Same as Ref. #159, SCC 3-03-005-17
161.	3-03-005-23	36.0	Assume psd same as Ref. #152a; 27% \leq 10 μ m.
162.			Deleted
163.	3-03-005-25	55.0	Same as Ref. #149, SCC 3-03-005-02; 53% \leq 10 μ m.
164a	3-03-005-26	10.0	Same as Ref. #151, SCC 3-03-005-06; 48% \leq 10 μ m.
164b	3-03-005-27	10.0	Same as Ref #151; 48% \leq 10 μ m.
164c	3-03-005-28		No basis for technology transfer.
164d	3-03-005-29	45.0	Same as Ref. #149; 53% \leq 10 μ m.
164e	3-03-005-30	55.0	Same as Ref. #149; 53% \leq 10 μ m.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
164f	3-03-005-31	50.0	Same as Ref. #152a; 27% ≤ 10 um.
164g	3-03-005-32	50.0	Same as Ref. #152a; 27% ≤ 10 um.
164h	3-03-005-33	100.0	Same as Ref. #153; 58% ≤ 10 um.
164i	3-03-005-34	140.0	Same as Ref. #154; 59% ≤ 10 um.
164j	3-03-005-35	100.0	Same as Ref. #153; 58% ≤ 10 um.
165.	3-03-006-02	316.0	No basis for technology transfer. As default value assume psd is same as for 50% Si Fe, AP-42, Table 7.4-4; 63% ≤ 10 um.
166.	3-03-006-03	564.0	Same as Ref. #165.
167.	3-03-007-01	12.0	No basis for technology transfer. Assume same psd as Ref. #165; 68% ≤ 10 um.
168.	3-03-008-01	110.0	No basis for technology transfer. Assume source of PM is coke, with psd of 44% ≤ 10 um; sinter with psd of 32% ≤ 10 um. Average default value of $\frac{44 + 32}{2} = 38\% \leq 10 \text{ um.}$
169.	3-03-008-02	40.0	No basis for Technology Transfer. Assume same as Ref. 168.
170.	3-03-008-14	6.8	Assume same psd as windbox; AP-42, Table 7.5-2; 15% ≤ 10 um.
171.	3-03-008-17	3.0	Same as Ref. #170, SCC 3-03-008-14
172.	3-03-008-19	0.8	Same as Ref. #170.
173.	3-03-008-20	0.17	PSD based on AP-42, Table 7.5-4, and data in Reference 4 of 7.5; 7.74% ≤ 10 um.
174.	3-03-008-26	87.0	Assume composition of collapsed charge is same as ore charge, Ref. #168; 38% ≤ 10 um.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
175.	3-03-009-04	11.3	Assume similar to carbon steel, AP-42, Table 7.5-2; 58% ≤ 10 μ m.
176.	3-03-009-08	50.0	From AP-42, Table 7.5-2, for electric arc furnace; 58% ≤ 10 μ m.
177.	3-03-009-13	28.5	Assume similar to psd of BOF charge, AP-42, Table 7.5-2; 46% ≤ 10 μ m.
178.	3-03-009-14	28.5	Same as Ref. #177, SCC 3-03-009-13
179.	3-03-009-15	0.19	Assume similar to BOF tapping, AP-42, Table 7.5-2; 45% ≤ 10 μ m.
180.	3-03-009-21	0.07	Same as Ref. #179, SCC 3-03-009-15
181.	3-03-009-25	0.81	Same as Ref. #179, SCC 3-03-009-15
182.	3-03-009-32	0.10	No basis for technology transfer. Assume all fume, 100% ≤ 10 μ m, by engineering judgement.
183.	3-03-010-05	5.0	From AP-42, App. C.2, Category 4, 85% ≤ 10 μ m.
184.	3-03-010-06	213.0	Assume same psd as materials handling, Ref. # 183; 85% ≤ 10 μ m.
185.	3-03-010-08	4.6	No basis for technology transfer. Assume similar to psd for copper reverb. furnace slag tapping; AP-42, Table 7.3-8; 28% ≤ 10 μ m.
186.	3-03-010-09	0.48	Assume psd for process similar to psd for fugitives from dross kettle, AP-42, Table 7.6-6; 98% ≤ 10 μ m.
187.	3-03-010-10	1.0	Same as Ref. #183, SCC 3-03-010-05.
188.	3-03-010-11	0.4	Same as Ref. #183
189.	3-03-010-12	0.3	Same as Ref. #183

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
190.	3-03-010-13	0.5	Same as Ref. #183
191.	3-03-010-14	2.26	Assume same psd as fugitive emissions from lead ore storage; AP-42, Table 7.6-3; 86% \leq 10 μ m
192.	3-03-010-15	1.5	Same as Ref. #173; 7.74% \leq 10 μ m.
193.	3-03-010-16	0.2	Same as Ref. #192
194.	3-03-010-17	9.0	Use AP-42, Appendix C.2-2, Category 5; 53% \leq 10 μ m
195.	3-03-010-19	0.16	Assume similar to BOF tapping, AP-42, Table 7.5-2; 45% \leq 10 μ m
196.	3-03-010-20	0.93	No basis for technology transfer. Assume all fume, 100% \leq 10 μ m based on engineering judgement.
197.	3-03-010-21	0.47	Same as Ref. #185, 28% \leq 10 μ m
198.	3-03-010-22	1.8	No basis for technology transfer. Assume psd similar to fugitives for dross kettle, Ref. #186; 98% \leq 10 μ m.
199.	3-03-010-23	0.87	Same as Ref. #198.
200.	3-03-010-24	3.0	Same as Ref. #198
201.	3-03-010-25	0.68	Use fugitive psd for sinter machine, AP-42, Table 7.6-4; 98% \leq 10 μ m.
202.	3-03-010-26	0.01	Same as Ref. #192; 7.74% \leq 10 μ m
203.	3-03-012-02	0.5	From AP-42, Appendix C.2, Category 4; 85% \leq 10 μ m
204.	3-03-023-04	0.1	Assume same psd as fine crushing; AP-42, App. C.2-2, Category 4; 85% \leq 10 μ m.
205.	3-03-023-07	0.04	From AP-42, Appendix C.2, Category 4; 85% \leq 10 μ m.
206.	3-03-023-12	29.2	Same as Ref. #205
207.	3-03-023-13	29.2	Same as Ref. #205

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
208.	3-03-023-14	29.2	Same as Ref. #205
209.	3-03-023-21	11.0	From AP-42, Table 8.22-4; Factor: 6.2 lb/VMT \leq 10 μ m.
210.	3-03-023-22	9.3	From AP-42, Table 8.22-4; Factor: 5.2 lb/VMT \leq 10 μ m.
211.	3-03-024-01	0.5	From AP-42, Table 8.23-1; PM ₁₀ given as 0.05 lb/ton.
212.	3-03-024-02	1.2	From AP-42, Table 8.23-1 PM ₁₀ fraction for primary crushing of low moisture ore is 10%, and for tertiary, 6%. Assume 8% for secondary crushing.
213.	3-03-024-03	2.7	Use AP-42, Table 8.23-1.
214.	3-03-024-04	0.12	From AP-42, App. C.2-2, Category 3, 51% \leq 10 μ m
215.	3-03-024-05	0.02	From AP-42, Table 8.23-1, for high moisture ore, PM ₁₀ emission factor is given as 0.009 lb/ton for primary grinding.
216.	3-03-024-06	0.05	Same as Ref. #215, for secondary grinding, 0.02 lb/ton
217.	3-03-024-07	0.06	Same as Ref. #215, for tertiary grinding, 0.02 lb/ton
218.	3-03-024-08	0.01	Same as Ref. # 214
219.	3-03-024-09	28.8	From AP-42, Appendix C-2, Category 4, low end of range, 70% \leq μ m, assuming air conveying will increase proportion of coarse particles in stream.
220.	3-03-024-10	2.4	w/o air conveying; from AP-42, App.C.2-2 Category 4; 85% \leq 10 μ m
221.	3-03-024-11	19.7	From AP-42, Table 8.23-1, in which drying is given as <u>12.0</u> or 61% \leq 10 μ m. 19.7
222.	3-03-030-09	4.0	From AP-42, Appendix C.2, Category 4; 85% \leq 10 μ m.
223.	3-03-030-10	1.5	Same as Ref. #222.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
224.	3-03-030-11	2.5	Same as Ref. #222.
225.	3-03-030-12	0.4	Same as Ref. #141; 58% \leq 10 um.
226.	3-04-002-07	275.0	From AP-42, Appendix C.2, Category 9, 92% \leq 10 um
227.	3-04-002-08	275.0	Same as Ref. #226.
228.	3-04-002-10	0.0003	Same as Ref. #226.
229.	3-04-002-11	230.0	Same as Ref. #226.
230.	3-04-002-12	70.0	Same as Ref. #226.
231.	3-04-002-14	5.1	Assume similar to SCC 3-04-008-18. Reverb furnace firing general metallic scrap; 100% \leq 10 um.
232.	3-04-002-15	36.0	Assume similar to secondary Zn reverb furnace charging residual metallic scrap, SCC 3-04-008-38; 59% \leq 10 um.
233.	3-04-002-17	300.0	Assume same psd as reverb. furnace charged with residual metallic scrap, SCC 3-04-008- 38, 59% \leq 10 um
234.	3-04-002-19	21.0	Assume same psd as reverb. furnace charged with residual mettalic scrap, SCC 3-04-008- 38, 59% \leq 10 um
235.	3-04-002-20	5.0	Assume similar to SCC 3-04-008-28 Reverb furnace charged with general residual metallic scrap, 100% \leq 10 um
236.	3-04-002-21	11.0	Assume same psd as reverb. furnace charged with general residual metallic scrap, SCC 3- 04-008-38, 59% \leq 10 um
237.	3-04-002-23	7.0	Assume similar to SCC 3-04-008-18 Reverb furnace charged w/scrap; 100% \leq 10 um
238.	3-04-002-24	20.0	Assume same psd as Ref. #237
239.	3-04-002-31	13.75	Same as Ref. #240; 60% \leq 10 um

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
240.	3-04-002-32	13.75	Assume psd of all fugitives similar to SCC 3-04-008-61 through 65; 60% \leq um
241.	3-04-002-33	0.75	Assume psd of all fugitives similar to SCC 3-04-008-61-65; 60% \leq 10 um
242.	3-04-002-34	3.66	Assume psd of all fugitives similar to SCC 3-04-008-61-65; 60% \leq 10 um
243.	3-04-002-35	5.27	Assume psd of all fugitives similar to SCC 3-04-008-61-65; 60% \leq 10 um
244.	3-04-002-36	4.43	Assume psd of all fugitives similar to SCC 3-04-008-61-65; 60% \leq 10 um
245.	3-04-002-37	0.49	Assume psd of all fugitives similar to SCC 3-04-008-61-65; 60% \leq 10 um
246.	3-04-002-38	0.14	Assume psd of all fugitives similar to SCC 3-04-008-61-65; 60% \leq 10 um
247.	3-04-002-39	0.015	Assume fugitives from casting to be 100% \leq 10 um, by engineering judgement
248.	3-04-003-02	2.1	Assume the low range of AP-42, App. C.2-2 Category 8: 80% \leq 10 um
249.	3-04-003-03	0.9	Assume psd to be halfway between midrange and the high side of the range of AP-42, App. C.2-2 Category 8: 95.5% \leq 10 um
250.	3-04-003-15	0.6	No basis for technology transfer. Assume psd same as fugitives in secondary copper smelting; 60% \leq 10 um
251.	3-04-003-20	2.8	Assume psd same as fugitives from secondary Zn processing; 100% \leq 10 um
252.	3-04-003-25	1.4	Assume psd same as fugitives from secondary Zn processing; 100% \leq 10 um

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
253.	3-04-003-40	17.0	Assume grinding and cleaning of castings not to produce more than 10% ≤ 10 μ m PM.
254.	3-04-003-50	3.6*	Assume not more than 15% ≤ 10 μ m
255.	3-04-003-51	2.71	Use AP-42, App. C.1, 7.13, Castings Shakeout; 82% ≤ 10 μ m
256.	3-04-003-52	40.0	Same as Ref. #254.
257.	3-04-003-53	1.1	Use AP-42, App. C.1, 7.13, Castings Shakeout; 82% ≤ 10 μ m
258.	3-04-003-60	0.01	Assume psd similar to machine scarfing in steel production: 45% ≤ 10 μ m.
259.	3-04-004-01	0.8	Assume pot furnace similar to kettle. Psd data in AP-42, Section 7.11 states median particle diameter is 18.9 μ m. Assume 25% ≤ 10 μ m
260.	3-04-004-02	323	In AP-42 Section 7.11, reverberatory furnaces are reported as emitting small particles. Reverb furnace in AP-42, Section 7.8 produces 60% ≤ 10 μ m. Assume same for lead.
261.	3-04-004-03	307	Assume psd relationship for baghouse - controlled to uncontrolled - is same as for blast furnace flue gas to ventilation; 42% ≤ 10 μ m
262.	3-04-004-03	70.0	Assume rotary sweat furnace psd same as rotary sweat furnace in secondary Zn (SCC 3-04-008-09); 92% ≤ 10 μ m
263.	3-04-004-05	51.0	Assume 60% ≤ 10 μ m, as in SCC 3-04-004-02
264.	3-04-004-08	40.0	From AP-42, Section 7.11, pg. 9, text states 100% ≤ 10 μ m.

* From AP-42, Supplement A, 10/86, Table 7.10-4.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
265.	3-04-004-09	0.87	Assume psd same as grid casting in lead battery mfg.; 100% \leq 10 um. From AP-42, Appendix C.1-65.
266.	3-04-004-12	2.55	Assume psd of fugitives same as psd of stack emissions (SCC 3-04-008-09); 92% \leq 10 um.
267.	3-04-004-13	16.5	Assume fugitives from smelting have same psd as Reverb. furnace, Ref. 260, SCC 3-04-004-02; 60% \leq 10 um.
268.	3-04-004-14	0.002	Assume psd of fugitives from kettle refining to be 100% \leq 10 um, by engineering judgement.
269.	3-04-005-05	139.0	Assume psd for overall process is 90% \leq 10 um, since many of the operations are 100% \leq 10 um.
270.	3-04-005-07	3.92	PsD for paste mixing is 100% \leq 10 um, per AP-42, App. C.1 - 7.15
271.	3-04-005-10	6.68	Assume similar to pot furnace in secondary lead processing; 25% \leq 10 um
272.	3-04-005-11	0.19	Assume psd for small parts casting is same as grid casting, from AP-42, App. C.1 - 7.15; 100% \leq 10 um.
273.	3-04-005-12	32.4	Assume 100% of pm is sulfuric acid mist, which AP-42, App. C.1 - 5.17 reports as 100% \leq 10 um
274.	3-04-007-03	10.0	From AP-42, App. C.1 - 6.3, assume psd is similar to psd of open hearth furnace without O_2 lance; 85% \leq 10 um
275.	3-04-007-05	0.1	From AP-42, Appendix C.2, Category 8, 92% \leq 10 um.
276.	3-04-007-06	3.6	Same as Ref. #254, SCC 3-04-003-50

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
277.	3-04-007-07	2.71	Assume psd similar to core oven in gray iron foundry; 82% $\leq 10 \text{ um}$
278.	3-04-007-08	5.0 2.8	Assume psd similar to gray iron foundry; Ref. #251, SCC 3-04- 003-20; 100% $\leq 10 \text{ um}$
279.	3-04-007-11	17.0	Assume similar to Ref. #253, SCC 304-003-40, gray iron foundry; 10% $\leq 10 \text{ um}$
280.	3-04-007-12	0.6	Assume psd same as Gray Iron Foundry, Ref. #250, SCC 3-04- 003-15; 60% $\leq 10 \text{ um}$.
281.	3-04-007-13	10.0 1.4	Same as Ref. #252, SCC 3-04-003-25; 100% $\leq 10 \text{ um}$.
282.	3-04-007-15	0.01	Same as Ref. #258, SCC 3-04-003-60; 45% $\leq 10 \text{ um}$.
283.	3-04-007-16	40.0	Same as Ref. #256, SCC 3-04-003-52, 15% $\leq 10 \text{ um}$
284.	3-04-007-17	1.1	Same as Ref. #257, SCC 3-04-003-53; 82% $\leq 10 \text{ um}$.
285.	3-04-040-01	0.6	Assume same psd as sweating furnace in sec. lead smelting; Ref. #263, SCC 3-04-004-05; 60% $\leq 10 \text{ um}$
286.	3-05-001-01	7.2	Assume psd similar to distillation, AP-42, App. C.2, Category 9, 94% $\leq 10 \text{ um}$
287.	3-05-001-02	26.7	Same as Ref. #286
288.	3-05-001-03	0.5	Assume pm is 100% PM ₁₀ by engineering judgement
289.	3-05-001-04	3.14	$[(3.14 - 0.5) 66\% + (0.5)100\%]$ $= 72\% \leq 10 \text{ um}$. Assume 66% from detergent spray dryer & 100% from Ref. #288.
290.	3-05-002-02	0.2	From AP-42, Table 8.1-2, assume psd is same as uncontrolled plant; 14% $\leq 10 \text{ um}$.
291.	3-05-002-03	0.33	Use Table 11.2.3-2 in AP-42; 36% $\leq 10 \text{ um}$.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
292a	3-05-002-04	0.1	Same as Ref. #291, SCC 3-05-002-03
292b	3-05-002-11	1.7	From AP-42 (10/86), Table 8.1-2; 21% \leq 10 μ m.
293.	3-05-003-01	70.0	From AP-42 Appendix C.2, Category 3 Assume psd similar to ore drying (SCC 3-05-000-02); 88% \leq 10 μm 51
294.	3-05-003-03	34.0	Assume psd similar to storage piles. Ref. 291, SCC 3-05-002-03; 36% \leq 10 μ m
295.	3-05-003-08	20.0	Assume psd for screening is similar to Brick Raw Material screening/grinding; AP-42, Table 8.3-4; 7% \leq 10 μ m.
296.	3-05-003-11	0.02	Use AP-42, Appendix C.2, Category 5; 53% \leq 10 μ m
297.	3-05-003-12	0.6	Same as Ref. #296.
298.	3-05-003-14	0.065	Same as Ref. #296.
299.	3-05-003-15	0.88	Same as Ref. #296.
300.	3-05-003-16	18.8A	Same as Ref. #296.
301.	3-05-004-01	24.0	Assume psd is similar to electric arc melting in castable refractories (SCC 3-05-005-03), where 92% \leq 10 μ m
302.	3-05-004-02	2.0	Assume psd is similar to raw material dryer in castable refractories (SCC 3-05-005-01) where 51% \leq 10 μ m
303.	3-05-004-03	26.0	Same as Ref. #301; 92% \leq 10 μ m.
304.	3-05-005-05	25.0	Assume molding similar to materials handling, AP-42, App. C.2, Cat. 8, 92% PM10: assume shakeout similar to shakeout in gray iron foundries, Table 7.10-5, 70% PM10. Avg. PM10 = $(92 + 70)/2 = 81\% \leq 10 \mu\text{m}$.
305.	3-05-006-07	0.2	Assume psd similar to concrete batching, cement unloading (SCC 3-05-011-07); 50% \leq 10 μ m

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
306.	3-05-006-08	4.0	Assume psd similar to storage piles, Ref. 291, SCC 3-05-002-03; 36% \leq 10 μ m
307.	3-05-006-09	0.5	Same as Ref. #302.
308.	3-05-006-10	1.5	Assume psd for secondary crushing produces a higher % of fines than primary crushing, assume 75% \leq 10 μ m
309.	3-05-006-12	0.3	From AP-42, Appendix C.2, Category 3; 51% \leq 10 μ m
310.	3-05-006-19	0.24	From AP-42, Appendix C.2, Category 4, 85% \leq 10 μ m
311.	3-05-007-07	0.2	Same as Ref. #305
312.	3-05-007-08	4.0	Same as Ref. #306
313.	3-05-007-09	0.5	Same as Ref. #307
314.	3-05-007-10	1.5	Same as Ref. #308
315.	3-05-007-12	0.3	Same as Ref. #309
316.	3-05-007-19	0.24	Same as Ref. #310
317.	3-05-009-03	12.0	Use AP-42, App. C.2, Category 3; 51% \leq 10 μ m
318.	3-05-009-04	0.5	Assume psd similar to SCC 3-05-005-02; Use AP-42 Appendix C.2, Category 3; 51% \leq 10 μ m.
319.	3-05-009-05	0.8	Same as Ref. #318.
320.	3-05-010-21	0.45	No basis for technology transfer. See AP-42, Section 8.24, Table 8.24-2.
321.	3-05-010-22	0.0001	See AP-42, Section 8.24 Table 8.24-2; Equation
322.	3-05-010-23	0.1	Assume psd same as 3-05-006-07, Ref. #305, unloading; 50% \leq 10 μ m
323.	3-05-010-30	0.05	Same as Ref. #320
324.	3-05-010-33	1.3	Assume wet drilling similar to stone drilling. From AP-42, Table 8.19.2-2, 12.5% \leq 10 μ m

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
325.	3-05-010-34	0.22	Same as Ref. #324
326.	3-05-010-37	0.03	Assume psd same as Ref. #305, SCC 3-05-006-07 - Raw Material Unloading; 50% \leq 10 μ m
327.	3-05-010-42	0.002	Assume psd same as Ref. #305, SCC 3-05-006-07; 50% \leq 10 μ m
328.	3-05-010-43	47,400	Assume same as Ref. #291, SCC 3-05-002-03; 36% \leq 10 μ m
329.	3-05-010-48	0.012	Assume same as Ref. #305, SCC 3-05006-07; 50% \leq 10 μ m
330.	3-05-010-49	760.0	Assume same as Ref. #305, SCC 3-05-006-07; 50% \leq 10 μ m
331.	3-05-011-20	0.2	Assume psd similar to cement unloading to storage bins (3- 05-011-07), bucket elevator; 50% \leq 10 μ m
332.	3-05-012-01	22.0	Assume psd for furnaces similar to melting furnace in glass mfg. AP-42 Table 8.13-2; 95% \leq 10 μ m
333.	3-05-012-02	27.5	Same as Ref. #332, SCC 3-05-012-01
334.	3-05-012-03	0.5	Same as Ref. #332 SCC 3-05-012-01
335.	3-05-012-04	58.0	No basis for technology transfer.
336.	3-05-012-05	9.0	Assume PM is 100% \leq 10 μ m; engineering judgement.
337.	3-05-012-06	1.3	Same as Ref. 336; 100% \leq 10 μ m.
338.	3-05-012-07	9.0	Same as Ref. #332; 95% \leq 10 μ m.
339.	3-05-012-08	2.0	No basis for technology transfer.
340.	3-05-012-09	6.0	Same as Ref. #336; 100% \leq 10 μ m.
341.	3-05-012-11	16.0	Same as Ref. #332; 95% \leq 10 μ m.
342.	3-05-012-12	2.0	Same as Ref. #332; 95% \leq 10 μ m.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
343.	3-05-012-13	6.0	Same as Ref. #332; 95% \leq 10 μ m.
344.	3-05-012-14	1.0	No basis for technology transfer.
345.	3-05-012-15	1.2	Same as Ref. #336; 100% \leq 10 μ m.
346.	3-05-013-01	16.0	Same as Ref. #332, 95% \leq 10 μ m.
347.	3-05-014-03	2.0	Same as Ref. #332, 95% \leq 10 μ m.
348.	3-05-014-04	17.4	Same as Ref. #332, 95% \leq 10 μ m.
349.	3-05-015-04	0.7	Assume psd same as conveying, AP-42, (9/88), Table 8.19.2-2, 22% \leq 10 μ m.
350.	3-05-015-05	0.5	From AP-42, Appendix C.2, Category 3, 51% \leq 10 μ m
351.	3-05-015-06	1.5	Assume psd similar to secondary crushing of cement raw materials (305-006-10); 75% \leq 10 μ m
352.	3-05-015-21	3.0	From AP-42, App. C.2, Category 4, 85% \leq 10 μ m
353.	3-05-015-22	5.0	From AP-42, App. C.2, Category 4; 85% \leq 10 μ m
354.	3-05-016-01	0.5	Same as Ref. #350, SCC 3-05-015-05
355.	3-05-016-02	1.5	Assume psd similar to secondary crushing of gypsum ore (3-05-015-06); 75% \leq 10 μ m.
356.	3-05-016-03	8.0	Assume psd similar to continuous kettle calciner (3-05-015-11); 63% \leq 10 μ m.
357.	3-05-016-05	50.0	Assume psd similar to continuous kettle calciner (3-05-015-11); 63% \leq 10 μ m
358.	3-05-016-07	0.8	Assume psd similar to conveying (3-05-015-04); 22% \leq 10 μ m
359.	3-05-016-08	0.2	Assume psd similar to Raw Material unloading, (3-05-012-21); 50% \leq 10 μ m

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
360.	3-05-016-09	0.1	Assume psd similar to spray drying of detergents (3-01-009-01); 67% \leq 10 um
361.	3-05-016-10	4.0	Assume similar to aggregate piles in asphaltic concrete, Ref. #291; 36% \leq 10 um
362.	3-05-016-11	40.0	Same as Ref. #356; 63% \leq 10 um.
363.	3-05-016-12	0.1	Same as Ref. #360; 67% \leq 10 um.
364.	3-05-019-04	40.0	Assume psd same as Raw Material Storage Piles; 36% \leq 10 um
365.	3-05-020-06	no factor*	
366.	3-05-020-07	0.33	Assume psd similar to storage piles, SCC 3-05-016-10; 36% \leq 10 um
367.	3-05-020-09	0.16	No basis for technology transfer
368.	3-05-020-12	35.0	Assume psd is similar to SCC 3-05-002-01; 14% \leq 10 um
369.	3-05-025-02	0.33	Same as Ref. #361; 36% \leq 10 um.
370.	3-05-025-03	0.029	Same as Ref. #358; 22% \leq 10 um.
371.	3-05-025-07	3796.0	Same as Ref. #361; 36% \leq 10 um.
372.	3-06-001-03	12.0S	Assume psd is similar to residual oil fired in commercial boilers; AP42, Table 1.3-5; 62% $<$ 10 um
373.	3-06-001-04	3.0	Same as Ref. #5
374.	3-06-001-05	3.0	Same as Ref. #5
375.	3-06-001-06	3.0	Same as Ref. #5
376.	3-06-001-07	0.27	Same as Ref. #5
377.	3-06-002-01	242.0	From API pub. 4363, FCCU with internal cyclones emit PM with 70% \leq 10 um
378.	3-06-003-01	17.0	Same as Ref. #377

*The PM factor of 2.0 lb has been withdrawn.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
379.	3-06-012-01	523.0	Same as Ref. #377
380.	3-07-001-08	72.0	All fluid bed calciners are well controlled for product collection. PM is likely to be fine; assume psd similar to fluid coking (3-06-01201); 70% \leq 10 μ m
381.	3-07-001-10	230.0	Assume psd similar to recovery boiler w/o direct contact evaporator, Table 10.1-3, AP-42; 100% \leq 10 μ m
382.	3-07-004-02	0.6	No basis for technology transfer. As default value, assume psd is similar to cotton ginning; avg. psd; 58% \leq 10 μ m
383.	3-07-007-01	4.25	Same as Ref. #382
384.	3-07-007-03	0.6	Same as Ref. #382
385.	3-07-007-04	859.0	Same as Ref. #382
386.	3-07-007-11	4.64	Same as Ref. #382
387.	3-07-007-12	2.37	Same as Ref. #382
388.	3-07-007-13	3.18	Same as Ref. #382
389.	3-07-007-14	4.14	Same as Ref. #382
390.	3-07-007-15	3.7	Same as Ref. #382
391.	3-07-008-01	0.02	Same as Ref. #382
392.	3-07-008-02	0.35	Same as Ref. #382
393.	3-07-008-03	1.0	Assume psd is similar to storage piles, Ref. #291, SCC 3-05-002-03; 36% \leq 10 μ m
394.	3-07-008-04	2.25	PSD from test data reported by CA Air Resources Board; 40% \leq 10 μ m.
395.	3-07-008-05	2.25	Same as Ref. #394; 40% \leq 10 μ m.
396.	3-07-008-06	4.0	Assume psd from sanding to consist of higher % of fines than from sawing. Assume 50% \leq 10 μ m.

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
397.	3-07-008-07	5.0	Same as Ref. #396; 50% \leq 10 um.
398.	3-07-008-08	2.0	Same as Ref. #394; 40% \leq 10 um.
399.	3-07-030-01	1.0	Same as Ref. #382; 58% \leq 10 um.
400.	3-07-030-02	2.0	Same as Ref. #382; 58% \leq 10 um.
401.	3-09-025-01	0.035	Assume psd is similar to 3-04-002-32, Ref. #240, wire incinerator fugitive emissions; 60% \leq 10 um
402.	3-10-004-01	2.0	Assume psd is similar to external combustion boiler firing distillate oil; AP-42, Table 1.3-4; 50% \leq 10 um
403.	3-10-004-02	12.0S	Same as above for residual oil: AP-42, Table 1.3-3; 86% \leq 10 um
404.	3-10-004-03	12.0S	Assume psd for crude oil is similar to residual oil (3-10-004-02); 86% \leq 10 um
405.	3-10-004-04	3.0	Assume psd is similar to 1-02-006-01 100% \leq 10 um
406.	3-10-004-05	3.0	Assume psd is similar to SCC 1-02-006-01; 100% \leq 10 um
407.	3-10-004-11	2.0	Assume psd is similar to oil fired industrial external combustion boiler (1-02-005-01); 50% \leq 10 um
408.	3-10-004-12	12.0S	Assume psd is similar to residual oil fired external comb. boilers (102-004-01); 86% \leq 10 um
409.	3-10-004-13	12.0S	Assume psd is similar to residual oil fired external combustion boilers (1-02-004-01); 86% \leq 10 um
410.	3-10-004-14	3.0	Same as Ref. #5
411.	3-10-004-15	3.0	Assume psd is similar to process gas fired boiler (1-02-007-01); 100% \leq 10 um

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
412.	3-60-001-01	0.7	Assume psd similar to secondary lead smelting in pot furnace (3-04-00401); 25% \leq 10 um
413.	4-02-016-01	9.68	Assume psd similar to detergent spray drying (3-01-009-01); 66.1% \leq 10 um
414.	5-01-005-05	8.0	Assume psd similar to municipal waste "starved air" incinerator: AP-42, (9/88), Table 2.1-2 ; 74% \leq 10 um
415.	5-01-005-07	20.0	Assume psd similar to refuse derived fuel in municipal waste combustion: AP-42, Table 2.1-2; 55% \leq 10 um
416.	5-01-005-08	7.0	Assume psd similar to refuse derived fuel in municipal waste combustion: AP-42, Table 2.1-2; 55% \leq 10 um
417.	5-01-005-10	13.0	Assume psd similar to municipal waste mass burn incinerator; AP-42, App. C.1, Table 2.1; 38% \leq 10 um
418.	5-01-005-11	138.0	Assume psd similar to municipal waste mass burn incinerator; App. C.1, Table 2.1; 38% \leq 10 um
419.	5-01-005-12	37.0	Assume psd similar to municipal waste mass burn incinerator; App. C.1, Table 2.1; 38% \leq 10 um
420.	5-02-001-01	7.0	Assume psd is similar to municipal waste modular incinerator; AP-42, App. C.1, Table 2.1; 67% \leq 10 um
421.	5-02-001-02	15.0	Assume psd is similar to municipal waste mass burn incinerator, AP-42, App. C.1, Table 2.1; 38% \leq 10 um
422.	5-02-001-03	1.4	Assume psd is similar to AP-42, Table 2.1-2; 74% \leq 10 um
423.	5-02-001-04	20.0	Assume same as Ref. #415

<u>Reference Number</u>	<u>SCC</u>	<u>PM Factor</u>	<u>Basis For PM10 Derivative</u>
424.	5-02-001-05	7.0	Assume same as Ref. #416
425.	5-02-003-01	30.0	Assume same as Ref. #418
426.	5-02-003-02	6.0	Assume same as Ref. #420
427.	5-02-005-05	8.0	Assume same as Ref. #414
428.	5-03-001-01	7.0	Assume same as Ref. #420
429.	5-03-001-02	15.0	Assume same as Ref. #421
430.	5-03-001-03	1.4	Assume same as Ref. #422
431.	5-03-001-04	20.0	Assume same as Ref. #415
432.	5-03-001-05	7.0	Assume same as Ref. #416
433.	5-03-001-06	13.0	Assume same as Ref. #417
434.	5-03-001-07	138.0	Assume same as Ref. #418
435.	5-03-001-08	2.0	Assume psd is similar to 3-04-00232, wire incinerator fugitive emissions; 60% ≤ 10 um
436.	5-03-001-09	37.0	Assume same as Ref. #419
437.	5-03-002-04	0.9	No basis for technology transfer. As default value, assume psd is same as lignite in spreader-stoker, APC, 100% 100% ≤ 10 um, based on observed burning.

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-450/4-89-022		2.		3. RECIPIENT'S ACCESSION NO.	
4. TITLE AND SUBTITLE PM ₁₀ Emission Factor Listing Developed By Technology Transfer and AIRS Source Classification Codes With Documentation				5. REPORT DATE November 1989	
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15. SUPPLEMENTARY NOTES The listing supplements AP-42, <u>Compilation of Air Pollutant Emission Factors</u> , Fourth Edition.					
16. ABSTRACT This report provides a listing of particulate matter emission factors, size-specific ≤ 10 micrometers (PM ₁₀) for fuel combustion, industrial and commercial operations, and solid wastes disposals. The factor list is identified with appropriate EPA AIRS Facility Subsystem (AFS) Source Classification Codes (SCCs) and their process descriptions. An appendix to the listing provides documentation of technology transfer rationale for the PM ₁₀ emission factors.					
17. KEY WORDS AND DOCUMENT ANALYSIS					
a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS		c. COSATI Field/Group	
Emission Factors Particle Size Emission Factors PM ₁₀ Emission Factors Combustion Sources Industrial Processes Solid Wastes Combustion Air Emissions					
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