097-48030-00060 AI# 12099

August Mack
ENVIRONMENTAL

317.916.8000 ▪ www.augustmack.com
1302 North Meridian Street, Suite 300 ▪ Indianapolis, Indiana 46202

June 28, 2024

Indiana Department of Environmental Management
Permits Branch, Office of Air Quality
100 North Senate Avenue
MC 61-53 IGCN 1003
Indianapolis, Indiana 46204-2251

LG
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Received
State of Indiana
JUL 01 2024
Dept of Environmental Mgmt
Office of Air Quality

Re: **Air Permit Revision Application**
Linde Advanced Material Technologies Inc.
Indianapolis, Indiana
FESOP Number 097-40170-00060
August Mack Project Number JY1553.250

Dear Sir or Madam:

August Mack Environmental, Inc. (August Mack), on behalf of Linde Advanced Material Technologies Inc. (Linde), is submitting the attached permit revision application for the Linde source located in Indianapolis, Indiana. A description of the updates is included below. Air permit application forms are provided in Attachment A. Emission calculations are provided in Attachment B.

PERMIT UPDATES

Linde is requesting that the IDEM revise the current Federally Enforceable State Operating Permit (FESOP) to make the following changes to the emission units' descriptions. The changes are indicated by red fonts, bold texts and strikethroughs.

1. Building 1550 powder manufacturing process - Linde plans to add:
   - Six (6) CSP spray dryers, each with the same throughput rate as the currently permitted dryers.
   - Three (3) natural gas-fired burners, each with the same maximum capacity as the current burners.
   - A baghouse and selective catalytic reduction (SCR) system for the six (6) spray dryers.
   - Three (3) rotary kilns.
   - Two (2) blenders.
   - Three (3) screeners.

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-8-3(c)(3)]
This stationary source consists of the following emission units and pollution control devices:
1550 Polco Street

a. One (1) powder manufacturing process, identified as CSP Department EU020, constructed in 2014, located at 1550 Polco Street, exhausting outdoors, and consisting of the following:
   1. One (1) raw material handling operation, identified as Raw Material Handling CSP, with a maximum capacity of 12.37 pounds of raw material per hour, consisting of a liquid pumping operation and solid scooping operation, and utilizing no control;
   2. One (1) raw material mixing operation, identified as Raw Material Mixing CSP, in which raw materials are mixed inside of an enclosed 55-gallon drum, utilizing no control, and with no exhaust;
   3. One (1) combustion spray pyrolysis (CSP) operation, approved in 2023 and 2024 to increase its maximum capacity, with a maximum capacity of twelve (12) ~~six (6)~~ batches of powder per twenty (20) hours, including the following systems:
      A. Spray drying and
      B. Powder to an oxide foam converter and utilizing the following control devices:
      C. One (1) cyclonic collection system and
      D. Natural Gas Combustion Units:
         i. One (1) natural gas combustion unit, identified as a Burner 1 Associated with EU020, with a maximum capacity of 0.40 MMBtu per hour, and utilizing the one (1) CSP pollution control system.
         ii. One (1) natural gas combustion unit, identified as a Burner 2 Associated with EU020, approved in 2023 for construction, with a maximum capacity of 0.40 MMBtu per hour, and utilizing the one (1) CSP pollution control system.
         iii. One (1) natural gas combustion unit, identified as a Burner 3 Associated with EU020, approved for construction in 2024, with a maximum capacity of 0.40 MMBtu per hour, and utilizing the one (1) CSP pollution control system.
         iv. Three (3) natural gas combustion units, identified as Burners 4, 5 and 6 Associated with EU020, to be constructed in 2025, each with a maximum capacity of 0.40 MMBtu per hour, and utilizing the one (1) CSP pollution control system.
      E. One (1) CSP pollution control system, used to collect material not captured by the cyclonic collection system, which includes the following control devices:
         i. One (1) dust collector, identified as BAG1 (CSP), and

ii. One (1) selective catalytic reduction system, identified as SCR1 (CSP);
iii. One (1) dust collector, identified as BAG2 (CSP), and
iv. One (1) selective catalytic reduction system, identified as SCR2 (CSP).

4. One (1) powder handling operation to convey powder to a hopper after CSP, identified as Powder Handling After CSP, with a maximum capacity of 84.90 pounds of powder fed into a kiln per hour, and utilizing two (2) dust collectors, identified as DC033 and DC020A, as control.

   This Powder Handling After CSP is approved in 2024 to add a control.

5. Ten (10) ~~Seven (7)~~ kilns:
   A. One (1) electrically heated kiln, identified as Kiln 1, permitted in 2022 to use a control, approved in 2023 to increase its maximum capacity, with a maximum capacity of six (6) batches of powder per twenty (20) hours, used to calcine powder, and utilizing a dust collector, identified as DC030~~033~~, as control;
   B. Two (2) electrically heated rotary kilns, identified as Kiln 2 and Kiln 3, constructed in 2022, approved in 2023 to increase its maximum capacity, each with a maximum capacity of six (6) batches of powder per twenty (20) hours, used to calcine powder, and utilizing a dust collector, identified as DC033, as control;
   C. Four (4) electrically heated kilns, identified as Kiln 4, Kiln 5, Kiln 6 and Kiln 7, approved in 2024 for construction, each with a maximum capacity of six (6) batches of powder per twenty (20) hours, used to calcine powder, and utilizing a dust collector, identified as DC033, as control.
   D. Three (3) electrically heated rotary kilns, identified as Kiln 8, Kiln 9 and Kiln 10, to be constructed in 2024, each with a maximum capacity of six (6) batches of powder per twenty (20) hours, used to calcine powder, and utilizing a dust collector, identified as DC033, as control.
6. One (1) powder handling operation after the kiln, identified as Powder Handling After Kiln, with a maximum capacity of 84.90 pounds of powder conveyed to a hopper per hour, which feeds the milling process, and utilizing a dust collector, identified as DC-030~~033~~, as control;
7. Nine (9) enclosed mills:

A. One (1) enclosed ball mill, identified as Mill 1, permitted in 2022, with a maximum capacity of 84.90 pounds of powder milled per hour, emitting only during loading and unloading powder handling operations, and utilizing a dust collector, identified as DC-030, as control;
B. Two (2) enclosed DM1 post kiln mills, identified as Mill 2 and Mill 3, constructed in 2024, each with a maximum capacity of 84.90 pounds of powder milled per hour, emitting only during loading and unloading powder handling operations, and utilizing a dust collector, identified as DC-030, as control;
C. Two (2) enclosed DM1 pre-kiln mills, identified as Mill 4 and Mill 5, approved in 2024 for construction, each with a maximum capacity of 84.90 pounds of powder milled per hour, emitting only during loading and unloading powder handling operations, and utilizing a dust collector, identified as DC-030, as control;
D. Four (4) enclosed DM4 post kiln mills, identified as Mill 6 to Mill 9, approved in 2024 for construction, with a maximum capacity of 30 pounds of powder milled per hour, emitting only during loading and unloading powder handling operations, and utilizing a dust collector, identified as DC-030, as control;

8. One (1) powder handling operation after the mill, identified as Powder Handling After Mill, including six (6) ~~three (3)~~ screeners and one (1) packaging operation, with a maximum capacity of 70.77 pounds of powder screened per hour and then conveyed to the blending hopper, and utilizing a dust collector, identified as DC-030~~33~~, as control;
9. Five (5) ~~Three (3)~~ primary enclosed blenders
   A. One (1) primary enclosed blender, identified as Blender 1, permitted in 2022 to use a control, used to homogenize the mixture, utilizing a dust collector, identified as DC-033, as control, and with no exhaust;
   B. One (1) primary enclosed blender, identified as Blender 2, constructed in 2023, used to homogenize the mixture, utilizing a dust collector, identifies as DC-033, as control, and with no exhaust;
   C. Three (3) ~~One (1)~~ primary enclosed blenders, identified as Blender 3, Blender 4 and Blender 5, to be constructed in 2025, used to homogenize the mixture, utilizing a dust collector, identified as DC-033, as control, and with no exhaust.
10. One (1) final powder handling process, identified as Final Powder Handling, with a maximum capacity of 70.77 pounds

of powder screened and packaged (~~three~~ six screeners) per hour, and utilizing a dust collector, identified as DC-030, as control.

This Final Powder Handling is approved in 2024 to change control.

Under NESHAP for Chemical Manufacturing Area Sources [40 CFR 63, Subpart VVVVVV], the one (1) powder manufacturing process, identified as CSP Department EU020, is considered an affected unit.

2. Linde is requesting that the CSP NOx and total HAPs limited potential to emit be adjusted as shown in Attachment B – Emissions Calculations.

SUMMARY OF POTENTIAL EMISSIONS

Detailed uncontrolled and limited potential emission calculations from the source are included as Attachment B.

CONCLUSION

Linde requests that the IDEM revise the air permit as described above. The facility still qualifies for a FESOP after the changes listed above.

If you have any questions regarding this submittal, please contact us.

Sincerely,

Jennifer Richards
Senior Consultant

Alic Bent
Director of Specialty Projects

Attachment

ATTACHMENT A

Permit Application Forms

AIR PERMIT APPLICATION COVER SHEET

State Form 50639 (R4 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this cover sheet is to obtain the core information needed to process the air permit application. This cover sheet is required for all air permit applications submitted to IDEM, OAQ. Place this cover sheet on top of all subsequent forms and attachments that encompass your air permit application packet.
- Submit the completed air permit application packet, including all forms and attachments, to **IDEM Air Permits Administration** using the address in the upper right hand corner of this page.
- IDEM will send a bill to collect the filing fee and any other applicable fees.
- Detailed instructions for this form are available on the Air Permit Application Forms website.

FOR OFFICE USE ONLY
PERMIT NUMBER:
097-48030-00060 AI# 12099
DATE APPLICATION WAS RECEIVED:
Received State of Indiana JUL 01 2024 Dept of Environmental Mgmt Office of Air Quality LG

1. Tax ID Number:

PART A: Purpose of Application

Part A identifies the purpose of this air permit application. For the purposes of this form, the term "source" refers to the plant site as a whole and NOT to individual emissions units.

2. Source / Company Name: Linde Advanced Material Technologies Inc. **3. Plant ID:** 097 — 00060

4. Billing Address: 1500 Polco Street

City: Indianapolis **State:** IN **ZIP Code:** 46224 –

5. Permit Level: ☐ Exemption ☐ Registration ☐ SSOA ☐ MSOP ☒ FESOP ☐ TVOP ☐ PBR

6. Application Summary: *Check all that apply. Multiple permit numbers may be assigned as needed based on the choices selected below.*

☐ Initial Permit ☐ Renewal of Operating Permit ☐ Asphalt General Permit
☐ Review Request ☐ Revocation of Operating Permit ☐ Alternate Emission Factor Request
☐ Interim Approval ☐ Relocation of Portable Source ☐ Acid Deposition (Phase II)
☐ Site Closure ☐ Emission Reduction Credit Registry

☐ Transition (between permit levels) *From:* *To:*

☐ Administrative Amendment: ☐ *Company Name Change* ☐ *Change of Responsible Official* ☐ *Correction to Non-Technical Information* ☐ *Notice Only Change* ☐ *Other (specify):*

☒ Modification: ☒ *New Emission Unit or Control Device* ☐ *Modified Emission Unit or Control Device* ☐ *New Applicable Permit Requirement* ☐ *Change to Applicability of a Permit Requirement* ☐ *Prevention of Significant Deterioration* ☐ *Emission Offset* ☐ *MACT Preconstruction Review* ☐ *Minor Source Modification* ☐ *Significant Source Modification* ☐ *Minor Permit Modification* ☐ *Significant Permit Modification* ☐ *Other (specify):*

7. Is this an application for an initial construction and/or operating permit for a **"Greenfield" Source**? ☐ Yes ☒ No

8. Is this an application for construction of a new emissions unit at an **Existing Source**? ☒ Yes ☐ No

Continued on Next Page

PART B: Pre-Application Meeting

Part B specifies whether a meeting was held or is being requested to discuss the permit application.

9. Was a meeting held between the company and IDEM prior to submitting this application to discuss the details of the project?

☒ No ☐ Yes: *Date:*

10. Would you like to schedule a meeting with IDEM management and your permit writer to discuss the details of this project?

☒ No ☐ Yes: *Proposed Date for Meeting:*

PART C: Confidential Business Information

Part C identifies permit applications that require special care to ensure that confidential business information is kept separate from the public file.

Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in the Indiana Administrative Code (IAC). To ensure that your information remains confidential, refer to the IDEM, OAQ information regarding submittal of confidential business information. For more information on confidentiality for certain types of business information, please review IDEM's Nonrule Policy Document Air-031-NPD regarding Emission Data.

11. Is any of the information contained within this application being claimed as **Confidential Business Information**?

☒ No ☐ Yes

PART D: Certification Of Truth, Accuracy, and Completeness

Part D is the official certification that the information contained within the air permit application packet is truthful, accurate, and complete. Any air permit application packet that we receive without a signed certification will be deemed incomplete and may result in denial of the permit.

For a Part 70 Operating Permit (TVOP) or a Source Specific Operating Agreement (SSOA), a "responsible official" as defined in 326 IAC 2-7-1(34) must certify the air permit application. For all other applicants, this person is an "authorized Individual" as defined in 326 IAC 2-1.1-1(1).

☒ *I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate, and complete.*

Michael Bass
Name *(typed)*

Facility Manager
Title

Michael G Bass
Signature

6/28/24
Date

OAQ GENERAL SOURCE DATA APPLICATION
GSD-01: Basic Source Level Information

State Form 50640 (R5 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of GSD-01 is to provide essential information about the entire source of air pollutant emissions. GSD-01 is a required form.
- Detailed instructions for this form are available on the Air Permit Application Forms website.
- All information submitted to IDEM will be made available to the public unless it is submitted under a claim of confidentiality. Claims of confidentiality must be made at the time the information is submitted to IDEM, and must follow the requirements set out in 326 IAC 17.1-4-1. Failure to follow these requirements exactly will result in your information becoming a public record, available for public inspection.

PART A: Source / Company Location Information

1. **Source / Company Name**: Linde Advanced Material Technologies Inc. — 2. **Plant ID**: 097 – 00060

3. **Location Address**: 1500 Polco Street

City: Indianapolis — **State**: IN — **ZIP Code**: 46224 –

4. **County Name**: Marion — 5. **Township Name**:

6. **Geographic Coordinates**:

Latitude: 39.786570 degrees — **Longitude**: -86.238131 degrees

7. **Universal Transferal Mercadum Coordinates** *(if known)*:

Zone: 16 N — **Horizontal**: 565235.28 m E — **Vertical**: 4404346.57 m N

8. **Adjacent States**: Is the source located within 50 miles of an adjacent state?

☒ No ☐ Yes – *Indicate Adjacent State(s):* ☐ Illinois (IL) ☐ Michigan (MI) ☐ Ohio (OH) ☐ Kentucky (KY)

9. **Attainment Area Designation**: Is the source located within a non-attainment area for any of the criteria air pollutants?

☐ No ☒ Yes – *Indicate Nonattainment Pollutant(s):* ☐ CO ☐ Pb ☐ NO_x ☐ O_3 ☐ PM ☐ PM_{10} ☒ $PM_{2.5}$ ☐ SO_2

10. **Portable / Stationary**: Is this a portable or stationary source? ☐ Portable ☒ Stationary

PART B: Source Summary

11. **Company Internet Address** *(optional)*:

12. **Company Name History**: Has this source operated under any other name(s)?

☒ No ☐ Yes – *Provide information regarding past company names in Part I, Company Name History.*

13. **Portable Source Location History**: Will the location of the portable source be changing in the near future?

☒ Not Applicable ☐ No ☐ Yes – *Complete Part J, Portable Source Location History, and Part K, Request to Change Location of Portable Source.*

14. **Existing Approvals**: Have any exemptions, registrations, or permits been issued to this source?

☐ No ☒ Yes – *List these permits and their corresponding emissions units in Part M, Existing Approvals.*

15. **Unpermitted Emissions Units**: Does this source have any unpermitted emissions units?

☒ No ☐ Yes – *List all unpermitted emissions units in Part N, Unpermitted Emissions Units.*

16. **New Source Review**: Is this source proposing to construct or modify any emissions units?

☐ No ☒ Yes – *List all proposed new construction in Part O, New or Modified Emissions Units.*

17. **Risk Management Plan**: Has this source submitted a Risk Management Plan?

☒ Not Required ☐ No ☐ Yes → Date submitted: EPA Facility Identifier: – –

Continued on Next Page

PART C: Source Contact Information		
IDEM will send the original, signed permit decision to the person identified in this section. This person MUST be an employee of the permitted source.		
18. Name of Source Contact Person: Michael Hess		
19. Title *(optional)*: Director of Special Projects		
20. Mailing Address: 1500 Polco Street		
City: Indianapolis	**State**: IN	**ZIP Code**: 46224 –
21. Electronic Mail Address *(optional)*:		
22. Telephone Number: (317) 240 – 2101	**23. Facsimile Number** *(optional)*: ( ) –	

PART D: Authorized Individual/Responsible Official Information		
IDEM will send a copy of the permit decision to the person indicated in this section, if the Authorized Individual or Responsible Official is different from the Source Contact specified in Part C.		
24. Name of Authorized Individual or Responsible Official: Michael Bass		
25. Title: Facility Manager		
26. Mailing Address: 1500 Polco Street		
City: Indianapolis	**State**: IN	**ZIP Code**: 46224 –
27. Telephone Number: (317) 240 – 2533	**28. Facsimile Number** *(optional)*: ( ) –	
29. Request to Change the Authorized Individual or Responsible Official: Is the source officially requesting to change the person designated as the Authorized Individual or Responsible Official in the official documents issued by IDEM, OAQ? *The permit may list the title of the Authorized Individual or Responsible Official in lieu of a specific name.* ☒ No ☐ Yes – ***Change Responsible Official to:***		

PART E: Owner Information		
30. Company Name of Owner: Linde Advanced Material Technologies Inc.		
31. Name of Owner Contact Person: Michael Bass		
32. Mailing Address: 1500 Polco Street		
City: Indianapolis	**State**: IN	**ZIP Code**: 46224 –
33. Telephone Number: (317) 240 – 2533	**34. Facsimile Number** *(optional)*: ( ) –	
34. Operator: Does the "Owner" company also operate the source to which this application applies?		
☐ No – *Proceed to Part F below.*	☒ Yes – *Enter "SAME AS OWNER" on line 35 and proceed to Part G below.*	

PART F: Operator Information		
35. Company Name of Operator: SAME AS OWNER		
36. Name of Operator Contact Person:		
37. Mailing Address:		
City:	**State**:	**ZIP Code**: –
38. Telephone Number: ( ) –	**39. Facsimile Number** *(optional)*: ( ) –	

Continued on Next Page

PART G: Agent Information

40. Company Name of Agent: August Mack Environmental, Inc.

41. Type of Agent: ☒ Environmental Consultant ☐ Attorney ☐ Other (specify):

42. Name of Agent Contact Person: Alic Bent

43. Mailing Address: 1302 N. Meridian Street, Suite 300

City: Indianapolis | **State**: IN | **ZIP Code**: 46202 –

44. Electronic Mail Address *(optional)*: abent@augustmack.com

45. Telephone Number: (317) 916 – 3124 | **46. Facsimile Number** *(optional)*: (317) 916 – 8001

47. Request for Follow-up: Does the "Agent" wish to receive a copy of the preliminary findings during the public notice period (if applicable) and a copy of the final determination? ☐ No ☒ Yes

PART H: Local Library Information

48. Date application packet was filed with the local library: within 10 days of application submittal

49. Name of Library: Speedway Public Library

50. Name of Librarian *(optional)*:

51. Mailing Address: 5633 W 25th Street

City: Indianapolis | **State**: IN | **ZIP Code**: 46224 –

52. Internet Address *(optional)*:

53. Electronic Mail Address *(optional)*:

54. Telephone Number: ( ) – | **55. Facsimile Number** *(optional)*: ( ) –

PART I: Company Name History *(if applicable)*

Complete this section only if the source has previously operated under a legal name that is different from the name listed above in Section A.

56. Legal Name of Company	57. Dates of Use
Praxair Surface Technologies	to 2022
	to
	to
	to
	to
	to
	to
	to
	to
	to

58. Company Name Change Request: Is the source officially requesting to change the legal name that will be printed on all official documents issued by IDEM, OAQ?

☒ No ☐ Yes – ***Change Company Name to:***

Continued on Next Page

PART J: Portable Source Location History *(if applicable)*

Complete this section only if the source is portable and the location has changed since the previous permit was issued. The current location of the source should be listed in Section A.

59. Plant ID	60. Location of the Portable Source	61. Dates at this Location
–		to
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–		to

PART K: Request to Change Location of Portable Source *(if applicable)*

Complete this section to request a change of location for a portable source.

62. Current Location:		
Address:		
City:	**State:**	**ZIP Code:** –
County Name:		
63. New Location:		
Address:		
City:	**State:**	**ZIP Code:** –
County Name:		

Continued on Next Page

PART L: Source Process Description

Complete this section to summarize the main processes at the source.

64. Process Description	65. Products	66. SIC Code	67. NAICS Code
Coating, Engraving, & Allied Services	Coated Machinery Parts	3479	332812
Manufacturing of Powders for Surface Coating and Polishing	Metallic and Non-metallic Powders	3999	339999

PART M: Existing Approvals *(if applicable)*

Complete this section to summarize the approvals issued to the source since issuance of the main operating permit.

68. Permit ID	69. Emissions Unit IDs	70. Expiration Date
46563	FESOP	4/1/2029
47533	Pending Significant Permit Revision	4/1/2029

PART N: Unpermitted Emissions Units *(if applicable)*

Complete this section only if the source has emission units that are not listed in any permit issued by IDEM, OAQ.

71. Emissions Unit ID	72. Type of Emissions Unit	73. Actual Dates		
		Began Construction	Completed Construction	Began Operation

PART O: New or Modified Emissions Units *(if applicable)*

Complete this section only if the source is proposing to add new emission units or modify existing emission units.

74. Emissions Unit ID	75. NEW	76. MOD	77. Type of Emissions Unit	78. Estimated Dates		
				Begin Construction	Complete Construction	Begin Operation
	X	X	See Cover Letter			

OAQ AIR PERMIT APPLICATION – FORMS CHECKLIST

State Form 51607 (R5 / 1-10)
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

IDEM – Office of Air Quality – Permits Branch
100 N. Senate Avenue, MC 61-53 Room 1003
Indianapolis, IN 46204-2251
Telephone: (317) 233-0178 or
Toll Free: 1-800-451-6027 x30178 (within Indiana)
Facsimile Number: (317) 232-6749
www.IN.gov/idem

NOTES:

- The purpose of this checklist is to help the applicant and IDEM, OAQ ensure that the air permit application packet is administratively complete. This checklist is a required form.
- Check the appropriate box indicating whether each application form is applicable for the current permit application. The source must submit only those forms pertinent to the current permit application.
- Place this checklist between the cover sheet and all subsequent forms and attachments that encompass your air permit application packet.

Part A: General Source Data				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☒ Y ☐ N	COVER	Application Cover Sheet	50639	Include for every application, modification, and renewal, including source specific operating agreements (SSOA).
☒ Y ☐ N	CHECKLIST	Forms Checklist	51607	Include for every application, modification, and renewal, including SSOA.
☒ Y ☐ N	GSD-01	Basic Source Level Information	50640	Include for every application, modification, and renewal, including SSOA.
☐ Y ☒ N	GSD-02	Plant Layout Diagram	51605	Include for every new source application, and modification.
☐ Y ☒ N	GSD-03	Process Flow Diagram	51599	Include one for every process covered by the application.
☐ Y ☒ N	GSD-04	Stack / Vent Information	51606	Include for every new source application, and modification.
☐ Y ☒ N	GSD-05	Emissions Unit Information	51610	Include for every process covered by the application.
☐ Y ☒ N	GSD-06	Particulate Emissions Summary	51612	Include if the process has particulate emissions (PM).
☐ Y ☒ N	GSD-07	Criteria Pollutant Emissions Summary	51602	Include if the process has criteria pollutant emissions.
☐ Y ☒ N	GSD-08	HAP Emissions Summary	51604	Include if the process has hazardous air pollutant emissions (HAP).
☐ Y ☒ N	GSD-09	Summary of Additional Information	51611	Include if the additional information is included.
☐ Y ☒ N	GSD-10	Insignificant Activities	51596	Include if there are unpermitted insignificant activities.
☐ Y ☒ N	GSD-11	Alternative Operating Scenario	51601	Include if an AOS is requested.
☐ Y ☒ N	GSD-12	Affidavit of Nonapplicability	51600	Include if the standard notification requirements do not apply.
☐ Y ☒ N	GSD-13	Affidavit of Applicability	51603	Include if the standard notification requirements apply.
☐ Y ☒ N	GSD-14	Owners and Occupants Notified	51609	Include if the standard notification requirements apply.
☐ Y ☒ N	GSD-15	Government Officials Notified	51608	Include if the standard notification requirements apply.
☐ Y ☒ N	RENEWAL	Renewal Checklist	51755	Include with every operating permit renewal packet.

Continued on Next Page

Part B: Process Information

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	AEF-01	Alternate Emission Factor Request	51860	Submit if you are requesting to use an emission factor other than AP-42.
☐ Y ☒ N	PI-01	Miscellaneous Processes	52534	Include one form for each process for which there is not a specific PI form.
☐ Y ☒ N	PI-02A	Combustion Unit Summary	52535	Include one form to summarize all combustion units *(unless SSOA)*.
☐ Y ☒ N	PI-02B	*Combustion:* Boilers, Process Heaters, & Furnaces	52536	Include one form for each boiler, process heater, or furnace *(unless SSOA)*.
☐ Y ☒ N	[illegible]	*Combustion:* Turbines & Internal Combustion Engines	52537	Include one form for each turbine or internal combustion engine *(unless SSOA)*.
☐ Y ☒ N	PI-02D	*Combustion:* Incinerators & Combustors	52538	Include one form for each incinerator or combustor *(unless SSOA)*.
☐ Y ☒ N	PI-02E	*Combustion:* Kilns	52539	Include one form for each kiln *(unless SSOA)*.
☐ Y ☒ N	PI-02F	*Combustion:* Fuel Use	52540	Include one form for each combustion unit *(unless SSOA)*.
☐ Y ☒ N	PI-02G	*Combustion:* Emission Factors	52541	Include one form for each combustion unit *(unless SSOA)*.
☐ Y ☒ N	PI-02H	*Combustion:* Federal Rule Applicability	52542	Include one form for each combustion unit *(unless SSOA)*.
☐ Y ☒ N	PI-03	Storage and Handling of Bulk Material	52543	Include if the process involves the storage and handling of bulk materials.
☐ Y ☒ N	PI-04	Asphalt Plants	52544	Include for each asphalt plant process (*unless general permit*).
☐ Y ☒ N	PI-05	Brick / Clay Products	52545	Include for each brick and/or clay products process.
☐ Y ☒ N	PI-06	Electroplating Operations	52546	Include for each electroplating process.
☐ Y ☒ N	PI-07	Welding Operations	52547	Include for each welding process.
☐ Y ☒ N	PI-08	Concrete Batchers	52548	Include for each concrete batcher *(unless SSOA)*.
☐ Y ☒ N	PI-09	Degreasing	52549	Include for each degreasing process *(unless SSOA)*.
☐ Y ☒ N	PI-10	Dry Cleaners	52550	Include for each dry cleaning process
☐ Y ☒ N	PI-11	Foundry Operations	52551	Include for each foundry process
☐ Y ☒ N	PI-12	Grain Elevators	52552	Include for each grain elevator *(unless SSOA)*.
☐ Y ☒ N	PI-13	Lime Manufacturing	52553	Include for each lime manufacturing process.
☐ Y ☒ N	PI-14	Liquid Organic Compound Storage	52554 (doc)	Include if the process involves the storage of liquid organic compounds.
☐ Y ☒ N	PI-14ALT	Alternate version of Liquid Organic Compound Storage	52555 (xls)	Include if the process involves the storage of liquid organic compounds and there are several storage vessels.
☐ Y ☒ N	PI-15	Portland Cement Manufacturing	52556	Include for each Portland cement manufacturing process.
☐ Y ☒ N	PI-16	Reinforced Plastics & Composites	52557	Include for each reinforced plastics and composites process.

Continued on Next Page

Part B: Process Information

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	PI-17	Blasting Operations	52558	Include for each blasting process *(unless SSOA).*
☐ Y ☒ N	PI-18	Mineral Processing	52559	Include if the process involves mineral processing *(unless SSOA).*
☐ Y ☒ N	PI-19	Surface Coating & Printing Operations	52560	Include for each surface coating or printing process *(unless SSOA).*
☐ Y ☒ N	PI-20	Woodworking / Plastic Machining	52561	Include for each woodworking or plastic machining process *(unless SSOA).*
☐ Y ☒ N	PI-21	Site Remediation	52570	Include for each soil remediation process.
☐ Y ☒ N	PI-22	Ethanol Plants ***(Under Development)***	None	Include for each ethanol plant.

Part C: Control Equipment

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	CE-01	Control Equipment Summary	51904	Include if add-on control equipment will be used for the process.
☐ Y ☒ N	CE-02	Particulates – Baghouse / Fabric Filter	51953	Include for each baghouse or fabric filter.
☐ Y ☒ N	CE-03	Particulates – Cyclone	52620	Include for each cyclone.
☐ Y ☒ N	CE-04	Particulates – Electrostatic Precipitator	52621	Include for each electrostatic precipitator.
☐ Y ☒ N	CE-05	Particulates – Wet Collector / Scrubber / Absorber	52622	Include for each wet collector, scrubber, or absorber.
☐ Y ☒ N	CE-06	Organics – Flare / Oxidizer / Incinerator	52623	Include for each flare, oxidizer, or incinerator.
☐ Y ☒ N	CE-07	Organics – Adsorbers	52624	Include for each adsorber.
☐ Y ☒ N	CE-08	Organics – Condenser	52625	Include for each condenser.
☐ Y ☒ N	CE-09	Reduction Technology	52626	Include for each control device using reduction technology (e.g., SCR, SNCR).
☐ Y ☒ N	CE-10	Miscellaneous Control Equipment	52436	Include one form for equipment for which there is not a specific CE form.

Continued on Next Page

Part D: Compliance Determination for Part 70 Sources				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	CD-01	Emissions Unit Compliance Status	51861	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-02	Compliance Plan by Applicable Requirement	51862	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-03	Compliance Plan by Emissions Unit	51863	Include for every Title V application, including modifications.
☐ Y ☒ N	CD-04	Compliance Schedule and Certification	51864	Include for every Title V application, including modifications and renewal.
☐ Y ☒ N	FED-03	Compliance Assurance Monitoring	53377	Include for every Title V application, including modifications.

Part E: Best Available Control Technology				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	BACT-01	Analysis of Best Available Control Technology	None	Include for every BACT application.
☐ Y ☒ N	BACT-01a	Background Search: Existing BACT Determinations	None	Include for every BACT application.
☐ Y ☒ N	BACT-01b	Cost/Economic Impact Analysis	None	Include for every BACT application.
☐ Y ☒ N	BACT-02	Summary of Best Available Control Technology	None	Include for every BACT application.
☐ Y ☒ N	PSD / EO-01	PSD / Emission Offset Checklist	None	Include for every PSD application and every NSR application that requires emission offsets.

Part F: Emission Credit Registry				
Applicable?	**Form ID**	**Title of Form**	**State Form Number**	**When should this form be included in my application packet?**
☐ Y ☒ N	EC-01	Generation of Emission Credits	51783	Include if the modification results in emission reductions.
☐ Y ☒ N	EC-02	Transfer of Emission Credits	51784	Submit whenever registered emission credits are transferred.
☐ Y ☒ N	EC-03	Use of Emission Credits	51785	Include if the modification requires the use of emission credits for offsets.
☐ Y ☒ N	EC-04	Emission Credit Request	51906	Submit if you are looking for emission credits for offsets.

Continued on Next Page

Part G: Plantwide Applicability Limits

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	PAL-01	Actuals Plantwide Applicability Limit	52451	Include if the modification results in emission reductions.
☐ Y ☒ N	PAL-02	Revised Plantwide Applicability Limit	52452	Submit whenever registered emission credits are transferred.
☐ Y ☒ N	PAL-03	Plantwide Applicability Limit Renewal	52453	Include if the modification requires the use of emission credits for offsets.
☐ Y ☒ N	PAL-04	Request for Termination of Plantwide Applicability Limit	52454	Submit if you are looking for emission credits for offsets.

Part H: Air Toxics

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	FED-01	Summary of Federal Requirements – NSPS & NESHAP	53512	Include for each 40 CFR Part 60 NSPS, 40 CFR Part 61 NESHAP, and 40 CFR Part 63 NESHAP applicable to the process.
☐ Y ☒ N	FED-02	MACT Pre-Construction Review	51905	Include if constructing or modifying a process subject to a Part 63 NESHAP.
☐ Y ☒ N	No Form ID	MACT Initial Notification	None	This form is available on the U.S. EPA website. Completed notifications should be submitted to the IDEM Compliance Branch.

Part I: Special Permits

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	INTERIM	Interim Approval	None	Submit if you are applying for interim operating approval.
☐ Y ☒ N	ASPHALT	Asphalt General Permit	None	Submit if you are applying for or modifying an asphalt plant general permit.
☐ Y ☒ N	NOXBTP	NO_x Budget Permit	None	Submit if you are a power plant or if you have opted in to the NO_x budget trading program.
☐ Y ☒ N	ACIDRAIN	Phase 2 Acid Rain Permit	None	Submit if you are applying for, modifying, or renewing a Phase 2 Acid Rain permit.

Continued on Next Page

Part J: Source Specific Operating Agreements (SSOA)

Applicable?	Form ID	Title of Form	State Form Number	When should this form be included in my application packet?
☐ Y ☒ N	OA-01	Summary of Application and Existing Agreements	53438	Submit if you are applying for or modifying a Source Specific Operating Agreement.
☐ Y ☒ N	OA-02	Industrial / Commercial Surface Coating Operations -OR- Graphic Arts Operations (326 IAC 2-9-2.5)	53439	Submit if you are applying for or modifying a SSOA for industrial or commercial surface coating operations not subject to 326 IAC 8-2; or graphic arts operations not subject to 326 IAC 8-5-5.
☐ Y ☒ N	OA-03	Surface Coating or Graphic Arts Operations (326 IAC 2-9-3)	53440	Submit if you are applying for or modifying a SSOA for surface coating or graphic arts operations.
☐ Y ☒ N	OA-04	Woodworking Operations (326 IAC 2-9-4)	53441	Submit if you are applying for or modifying a SSOA for woodworking operations.
☐ Y ☒ N	OA-05	Abrasive Cleaning Operations (326 IAC 2-9-5)	53442	Submit if you are applying for or modifying a SSOA for abrasive cleaning operations.
☐ Y ☒ N	OA-06	Grain Elevators (326 IAC 2-9-6)	53443	Submit if you are applying for or modifying a SSOA for grain elevators.
☐ Y ☒ N	OA-07	Sand And Gravel Plants (326 IAC 2-9-7)	53444	Submit if you are applying for or modifying a SSOA for sand and gravel plants.
☐ Y ☒ N	OA-08	Crushed Stone Processing Plants (326 IAC 2-9-8)	53445	Submit if you are applying for or modifying a SSOA for crushed stone processing plants.
☐ Y ☒ N	OA-09	Ready-Mix Concrete Batch Plants (326 IAC 2-9-9)	53446	Submit if you are applying for or modifying a SSOA for ready-mix concrete batch plants.
☐ Y ☒ N	OA-10	Coal Mines And Coal Preparation Plants (326 IAC 2-9-10)	53447	Submit if you are applying for or modifying a SSOA for coal mines and coal preparation plants.
☐ Y ☒ N	OA-11	Automobile Refinishing Operations (326 IAC 2-9-11)	53448	Submit if you are applying for or modifying a SSOA for automobile refinishing operations.
☐ Y ☒ N	OA-12	Degreasing Operations (326 IAC 2-9-12)	53449	Submit if you are applying for or modifying a SSOA for degreasing operations.
☐ Y ☒ N	OA-13	External Combustion Sources (326 IAC 2-9-13)	53450	Submit if you are applying for or modifying a SSOA for external combustion sources.
☐ Y ☒ N	OA-14	Internal Combustion Sources (326 IAC 2-9-14)	53451	Submit if you are applying for or modifying a SSOA for internal combustion sources.

ATTACHMENT B

Calculations

Appendix A: Emissions Summary
Summary of Unlimited Emissions Before Integral Controls

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emissions Units	Unlimited Potential to Emit (tons/year)									
	PM	PM_{10}	$PM_{2.5}$	SO_2	NOx	VOC	CO	Total HAPs	Single Worst Case HAP	
Powder Manufacturing Process: CSP Department EU020										
Raw Material Handling CSP	2.6E-04	1.3E-04	1.3E-04	—	—	—	—	—	—	
Raw Material Mixing CSP	negl.	negl.	negl.	—	—	—	—	—	—	
Combustion Spray Pyrolysis (CSP) operation	35.20	35.20	35.20	—	220.44	—	—	7.25	7.25	Nickel
Burners 1 to 6 Associated with EU020	1.6E-02	0.07	0.07	5.15E-03	0.84	0.05	0.72	1.6E-02	1.5E-02	Hexane
Powder Handling After CSP	3.8E-03	1.6E-03	1.6E-03	—	—	—	—	9.7E-04	9.7E-04	Nickel
Ten (10) Electrically-Heated Kilns 1 to 10	—	—	—	—	7.79	—	—	—	—	
Powder Handling After Kilns	3.8E-03	1.6E-03	1.6E-03	—	—	—	—	9.7E-04	9.7E-04	Nickel
9 Enclosed Mills 1 to 9	90.53	77.03	77.03	—	—	—	—	19.41	19.41	Nickel
Powder Handling After Mills	5.2E-03	2.6E-03	2.6E-03	—	—	—	—	1.3E-03	1.3E-03	Nickel
5 Primary Enclosed Blenders 1 to 5	—	—	—	—	—	—	—	—	—	
Final Powder Handling	5.3E-03	2.6E-03	2.6E-03	—	—	—	—	1.3E-03	1.3E-03	Nickel
Twenty-seven (27) Specialty Powders Manufacturing Operations	15.10	15.10	15.10	—	—	—	—	1.61	1.12	Chromium
Titanium Powder Processes	35.04	35.04	35.04	—	—	—	—	0.65	0.65	Chromium
Seamtech Process	1.29	1.29	1.29	—	—	1.33	—	0.09	0.09	Chromium
Forty-four (44) Grit Blasting Units	651.67	637.27	637.27	—	—	—	—	—	—	
Dry Ice Blasting Unit (02P3 EUG3)	1.95	1.95	1.95							
Two (2) Wet Grit Blasting Units	13.14	9.20	9.20	—	—	—	—	—	—	
Polishing Operation										
Powder Handling Operation	0.14	0.07	0.07	—	—	—	—	—	—	
Powder Mixing Operation	—	—	—	—	—	17.56	—	—	—	
Specialty Ingot manufacturing process										
Material Transfer Point	4.2E-03	2.0E-03	2.0E-03	—	—	—	—	—	—	
Ingot Machining Lathe	0.22	2.2E-03	2.2E-03	—	—	—	—	0.02	0.02	Lead
Pack Diffusion Process	1.95	1.95	1.95	—	—	—	—	0.24	0.24	Hydrofluoric Acid (HF)
Operation 1, Process 1 (O1P1)	0.07	0.07	0.07	—	—	—	—	—	—	
Operation 2, Process 1 (O2P1)	0.02	0.02	0.02	—	—	—	—	—	—	
Operation 2, Process 2 (O2P2)	3.5E-05	1.7E-05	1.7E-05	—	—	0.04	—	0.79	0.79	Methanol
Operation 2, Process 4 (O2P4)	—	—	—	—	—	—	—	1.57	1.57	Hydrofluoric Acid (HF)
Bader Grinders	450.51	450.51	450.51	—	—	—	—	—	—	
Twenty-four (24) surface coating stations	105.60	105.60	105.60	—	—	—	—	77.78	42.70	Chromium
Kerosene Combustion for Surface Coating Stations	5.2E-04	4.1E-04	4.1E-04	0.02	0.01	1.1E-04	1.6E-03	2.1E-06	6.3E-07	Selenium
Physical Vapor Deposition Station (EU011)	3.3E-04	3.3E-04	3.3E-04	—	—	—	—	—	—	
LSR1 Titanium Tetrachloride Coating Station (EU018)	—	—	—	—	—	—	—	0.91	0.91	Hydrochloric Acid (HCl)
Thirty-three (33) natural gas-fired combustion units	0.28	1.13	1.13	0.09	14.65	0.82	12.48	0.28	0.27	Hexane
Seven (7) natural gas-fired boilers	0.27	1.10	1.10	0.09	14.47	0.80	12.15	0.27	0.26	Hexane
Degreasing	—	—	—	—	—	9.02	—	4.63	4.01	Perchloroethylene (PCE)
Vacuum Sealer	—	—	—	—	—	0.26	—	—	—	
Epoxy Kit Operation (EUS-12)	7.6E-04	3.6E-04	3.6E-04	—	—	4.03	—	—	—	
Grit Reclassifier (EU020G)	0.01	2.9E-03	2.9E-03	—	—	—	—	—	—	
Three (3) 3D Printers	negl.	negl.	negl.	—	—	—	—	negl.	negl.	Nickel
Twenty-eight (28) grinding and cutting operations	1.56	0.03	0.03	—	—	—	—	0.12	0.12	Lead
Thirteen (13) welding and thermal cutting operations	1.70	1.70	1.70	—	—	—	—	0.09	0.06	Manganese
One (1) carpenter shop	0.17	4.9E-04	2.6E-04	—	—	—	—	—	—	
Five (5) finishing units	negl.	negl.	negl.	—	—	—	—	—	—	
Diesel Emergency Generators	0.21	0.21	0.21	0.19	2.91	0.24	0.63	2.5E-03	7.7E-04	Formaldehyde
Triboroot Lines (Lines #1 and #2)	—	—	—	—	—	—	—	1.39	0.62	Cobalt
Triboroot Line #3								0.04	0.02	
Scale Coating	—	—	—	—	—	0.03	—	3.2E-04	1.3E-04	Chromium
Operation 1, Process 3 (O1P3)	—	—	—	—	—	—	—	0.59	0.59	Hydrofluoric Acid (HF)
IPA Room Supporting EUS-22	—	—	—	—	—	2.92	—	—	—	
Stripping and Cleaning Operations	—	—	—	—	—	0.04	—	0.25	0.25	Hydrofluoric Acid (HF)
Lubricant Application Processes	—	—	—	—	—	0.21	—	0.07	0.03	Ethylene Glycol
Total without Fugitives	**1,636.61**	**1,374.56**	**1,374.56**	**0.40**	**261.33**	**37.33**	**25.98**	**118.41**	**51.52**	**Chromium**
Paved Roads	7.98	1.60	0.39	—	—	—	—	—	—	
Total with Fugitives	**1,644.59**	**1,376.15**	**1,374.95**	**0.40**	**261.33**	**37.33**	**25.98**	**118.41**	**51.52**	**Chromium**

*The baffles, baghouses, dust collectors, and HEPA filters are considered an integral part of the Specialty Powders Manufacturing Processes and the Surface Coating Processes. Therefore, the potential PM, PM10, and PM2.5 emissions from the surface coaters and the specialty powders manufacturing processes will continue to be calculated after consideration of the baffles, baghouses, dust collectors, and HEPA filters for purposes of determining permitting level and 326 IAC 6.5 applicability. However, for purposes of determining the applicability of Prevention of Significant Deterioration (PSD), potential emissions from the surface coaters and specialty powders manufacturing processes will continue to be calculated before consideration of the baffles, baghouses, dust collectors, and HEPA filters.

**Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

negl. = negligible

Appendix A: Emissions Summary
Summary of Limited Emissions

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emissions Units	Limited Potential to Emit (tons/year)									
	PM	PM_{10}	$PM_{2.5}$	SO_2	NOx	VOC	CO	Total HAPs	Single Worst Case HAP	
Powder Manufacturing Process: CSP Department EU020										
Raw Material Handling CSP	2.5E-04	1.3E-04	1.3E-04	—	—	—	—	—	—	
Raw Material Mixing CSP	negl.	negl.	negl.	—	—	—	—	—	—	
Combustion Spray Pyrolysis (CSP) operation	10.00	10.00	10.00	—	50.00	—	—	6.15	7.26	Nickel
Burners 1 to 6 Associated with EU020	1.0E-02	0.07	0.07	1.2E-03	0.85	0.05	0.72	1.6E-02	1.5E-02	Hexane
Powder Handling After CSP	3.6E-03	1.8E-03	1.8E-03	—	—	—	—	9.7E-04	9.7E-04	Nickel
Ten (10) Electrically-Heated Kilns 1 to 10	—	—	—	—	7.73	—	—	—	—	
Powder Handling After Kilns	3.6E-03	1.8E-03	1.8E-03	—	—	—	—	9.7E-04	9.7E-04	Nickel
9 Enclosed Mills 1 to 9	5.00	3.00	3.00	—	—	—	—	2.00	2.00	Nickel
Powder Handling After Mills	5.3E-03	2.6E-03	2.6E-03	—	—	—	—	1.3E-03	1.3E-03	Nickel
5 Primary Enclosed Blenders 1 to 5	—	—	—	—	—	—	—	—	—	
Final Powder Handling	5.3E-03	2.6E-03	2.6E-03	—	—	—	—	1.3E-03	1.3E-03	Nickel
Twenty-seven (27) Specialty Powders Manufacturing Operations**	7.66	7.66	7.66	—	—	—	—	1.61	1.32	Chromium
Titanium Powder Processes** (1)	2.50	2.50	2.50	—	—	—	—	0.95	0.85	Chromium
Semitech Process	1.29	1.29	1.29	—	—	1.33	—	0.06	0.06	Chromium
Forty-four (44) Grit Blasting Units** (1)	65.65	16.77	16.77	—	—	—	—	—	—	
Dry Ice Blasting Unit (O2P3 EUG3)	1.66	1.66	1.66							
Two (2) Wet Grit Blasting Units** (2)	0.48	0.48	0.48	—	—	—	—	—	—	
Polishing Operation										
Powder Handling Operation	0.14	0.07	0.07	—	—	—	—	—	—	
Powder Mixing Operation	—	—	—	—	—	17.55	—	—	—	
Specialty ingot manufacturing process										
Material Transfer Point	4.3E-03	2.1E-03	2.0E-03	—	—	—	—	—	—	
Lathe	0.22	2.2E-03	2.2E-03	—	—	—	—	0.02	0.02	Lead
Pack Diffusion Process	1.75	1.75	1.75	—	—	—	—	0.24	0.24	Hydrofluoric Acid (HF)
Operation 1, Process 1 (O1P1)	0.07	0.07	0.07	—	—	—	—	—	—	
Operation 2, Process 1 (O2P1)	0.02	0.02	0.02	—	—	—	—	—	—	
Operation 2, Process 2 (O2P2)	3.5E-05	1.7E-05	1.7E-05	—	—	0.04	—	0.79	0.79	Methanol
Operation 2, Process 4 (O2P4)	—	—	—	—	—	—	—	1.57	1.57	Hydrofluoric Acid (HF)
Radial Grinders** (1)	1.56	1.56	1.56	—	—	—	—	—	—	
Twenty-four (24) surface coating stations** (1)	31.04	23.71	23.71	—	—	—	—	2.86	2.85	Cobalt
Kerosene Combustion for Surface Coating Stations	6.2E-04	4.1E-04	4.1E-04	0.02	0.01	1.1E-04	1.1E-03	2.1E-05	6.3E-07	Selenium
Physical Vapor Deposition Station (EU01T)	3.3E-04	3.3E-04	3.3E-04	—	—	—	—	—	—	
LSR1 Titanium Tetrachloride Coating Station (EU01R)	—	—	—	—	—	—	—	0.91	0.91	Hydrochloric Acid (HCl)
Thirty-three (33) natural gas-fired combustion units	0.36	1.13	1.13	0.09	14.65	0.82	12.46	0.29	0.27	Hexane
Seven (7) natural gas-fired boilers	0.27	1.10	1.10	0.09	14.47	0.80	12.15	0.27	0.26	Hexane
Degreasing	—	—	—	—	—	0.02	—	4.65	4.01	Perchloroethylene (PCE)
Vacuum Sealer	—	—	—	—	—	0.24	—	—	—	
Epoxy Kit Operation (EUS-12)	7.5E-04	3.6E-04	3.6E-04	—	—	4.05	—	—	—	
Grit Reclassifier (EU320G)	0.01	2.9E-03	2.9E-03	—	—	—	—	—	—	
Three (3) 3D Printers	negl.	negl.	negl.	—	—	—	—	negl.	negl.	Nickel
Twenty-eight (28) grinding and cutting operations	1.56	0.03	0.03	—	—	—	—	0.12	0.12	Lead
Thirteen (13) welding and thermal cutting operations	1.76	1.70	1.70	—	—	—	—	0.06	0.06	Manganese
One (1) carpenter shop	0.12	4.5E-04	2.6E-04	—	—	—	—	—	—	
Five (5) finishing tests	negl.	negl.	negl.	—	—	—	—	—	—	
Diesel Emergency Generators	0.21	0.21	0.21	0.19	2.91	0.24	0.63	2.5E-03	7.7E-04	Formaldehyde
Tribomet Lines (Lines #1 and #2)	—	—	—	—	—	—	—	1.36	0.62	Cobalt
Tribomet Line #3								0.04	0.02	
Sealin Coating	—	—	—	—	—	0.03	—	3.2E-04	1.3E-04	Chromium
Operation 1, Process 3 (O1P3)	—	—	—	—	—	—	—	0.50	0.50	Hydrofluoric Acid (HF)
IPA Room Supporting EUS-22	—	—	—	—	—	2.92	—	—	—	
Stripping and Cleaning Operations	—	—	—	—	—	0.03	—	0.25	0.25	Hydrofluoric Acid (HF)
Lubricant Application Processes	—	—	—	—	—	0.31	—	0.07	0.03	Ethylene Glycol
Total	**164.75**	**83.37**	**83.37**	**0.40**	**99.97**	**37.33**	**25.58**	**24.57**	5.17	Chromium
Paved Roads	7.98	1.59	0.39	—	—	—	—	—	—	
Total with Fugitives*	**172.73**	**84.96**	**83.76**	**0.40**	**99.97**	**37.33**	**25.58**	**24.57**	5.17	Chromium

*Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

**The controls for these emission units have been determined to be integral to the process. Therefore, the unlimited and limited PTE for the purposes of Part 70 applicability were calculated after control.

***Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2, 326 IAC 2-3, or 326 IAC 2-7, and there is no applicable New Source Performance Standard that was in effect on August 7, 1980, fugitive emissions are not counted toward the determination of PSD, Emission Offset, and Part 70 Permit applicability.

(1) These units have 326 IAC 2-2 (Prevention of Significant Deterioration (PSD)) limitations for PM.
(2) These units have 326 IAC 2-2 (PSD) and 326 IAC 2-8 (FESOP) limitations for PM10 and PM2.5
(3) This unit has a 326 IAC 2-8 (FESOP) limitation for NOx.
(4) EU23A and EU37B do not have integral control devices. These units have 326 IAC 2-2 (PSD) limitations for PM and 326 IAC 2-2 (PSD) and 326 IAC 2-8 (FESOP) limitations for PM10 and PM2.5

Shaded cells indicate limits.

Appendix A: Emissions Summary
EU020 - Three (3) Kilns

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch Time (hours) = 20

[1]NO Formed (kg)	[4]NO_2 Formed (kg)	[2]% NO/ NO2 Generated in Kiln vs. CSP	[4]NO Emissions (kg)	[4]NO_2 Emissions (kg)	NO Emissions (kg/hr)	NO_2 Emissions (kg/hr)	NOx Emissions (kg/hr)	NOx Emissions (lbs/hr)	NOx Emissions (tons/yr)
32.325	198.27	1%	0.32325	1.9827	0.02	0.10	0.12	0.25	1.11
								Total for 3 Kilns:	**3.34**

[1]NO and NO_2 generated per batch is based on a similar process at another Praxair facility. This value is based on an air flow rate of 1,000 cfm and known air compositions of 480 ppm NO and 1,920 ppm NO_2.

[2]Note: 99% of the nitrates are reacted in the CSP, and the remaining 1% is reacted in the kiln.

METHODOLOGY FOR ABATEMENT SYSTEM CALCS:

NO/NO2 Emissions (kg) = NO/NO2 Formed (kg) x % NO/NO2 Generated in Kiln vs. CSP
NO/NO2 Emissions (kg/hr) = NO/NO2 Emissions (kg) / Batch Time (hours)
NOx Emissions (kg/hr) = NO Emissions (kg/hr) + NO2 Emissions (kg/hr)
Uncontrolled NOx Emissions (tons/yr) = NOx Emissions (lbs/hr) x (8,760 hrs/yr) / (2,000 lbs/ton)

Appendix A: Emissions Summary
EU020 - Four (4) Kilns

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch Time (hours) = 20

[1]NO Formed (kg)	[4]NO_2 Formed (kg)	[2]% NO/ NO2 Generated in Kiln vs. CSP	[4]NO Emissions (kg)	[4]NO_2 Emissions (kg)	NO Emissions (kg/hr)	NO_2 Emissions (kg/hr)	NOx Emissions (kg/hr)	NOx Emissions (lbs/hr)	NOx Emissions (tons/yr)
32.325	198.27	1%	0.32325	1.9827	0.02	0.10	0.12	0.25	1.11
								Total for 4 Kilns:	**4.45**

[1]NO and NO_2 generated per batch is based on a similar process at another Praxair facility. This value is based on an air flow rate of 1,000 cfm and known air compositions of 480 ppm NO and 1,920 ppm NO_2.

[2]Note: 99% of the nitrates are reacted in the CSP, and the remaining 1% is reacted in the kiln.

METHODOLOGY FOR ABATEMENT SYSTEM CALCS:

NO/NO2 Emissions (kg) = NO/NO2 Formed (kg) x % NO/NO2 Generated in Kiln vs. CSP
NO/NO2 Emissions (kg/hr) = NO/NO2 Emissions (kg) / Batch Time (hours)
NOx Emissions (kg/hr) = NO Emissions (kg/hr) + NO2 Emissions (kg/hr)
Uncontrolled NOx Emissions (tons/yr) = NOx Emissions (lbs/hr) x (8,760 hrs/yr) / (2,000 lbs/ton)

Appendix A: Emissions Summary
EU020 - Three (3) Kilns

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch Time (hours) = 20

[1]NO Formed (kg)	[4]NO_2 Formed (kg)	[2]% NO/ NO2 Generated in Kiln vs. CSP	[4]NO Emissions (kg)	[4]NO_2 Emissions (kg)	NO Emissions (kg/hr)	NO_2 Emissions (kg/hr)	NOx Emissions (kg/hr)	NOx Emissions (lbs/hr)	NOx Emissions (tons/yr)
32.325	198.27	1%	0.32325	1.9827	0.02	0.10	0.12	0.25	1.11
								Total for 3 Kilns:	3.34

[1]NO and NO_2 generated per batch is based on a similar process at another Praxair facility. This value is based on an air flow rate of 1,000 cfm and known air compositions of 480 ppm NO and 1,920 ppm NO_2.

[2]Note: 99% of the nitrates are reacted in the CSP, and the remaining 1% is reacted in the kiln.

METHODOLOGY FOR ABATEMENT SYSTEM CALCS:

NO/NO2 Emissions (kg) = NO/NO2 Formed (kg) x % NO/NO2 Generated in Kiln vs. CSP
NO/NO2 Emissions (kg/hr) = NO/NO2 Emissions (kg) / Batch Time (hours)
NOx Emissions (kg/hr) = NO Emissions (kg/hr) + NO2 Emissions (kg/hr)
Uncontrolled NOx Emissions (tons/yr) = NOx Emissions (lbs/hr) x (8,760 hrs/yr) / (2,000 lbs/ton)

Appendix A: Emissions Summary
EU020 - Raw Material Handling CSP

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Processes	Throughput (lbs/hr)*	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)
4 Batches	12.37	0.0069	0.0033	0.0002	0.0001
2 Batches	6.19	0.0069	0.0033	0.0001	0.0000
6 Batches	18.56	0.0069	0.0033	0.0003	0.0001
	37.12		**Total:**	0.0003	0.0001

METHODOLOGY:

*The throughput is based on the batch weights for dry materials. There are a total of 6 batches with a combined total weight of 18.56 pounds. None of the dry materials contain HAPs.

**Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer

Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)

326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Combustion Spray Pyrolysis (CSP) Operation

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Calculation of Process Rates and Masses

Batch Time (hours) = 20

Batch	Number of Batches	Solution Weight		Solids Weight		Weight Water Evaporated in Dryer		Oxides Weight	
		Weight for All Batches (kg)	Process Rate for all Batches (kg/hr)	For all Batches (kg)	For all Batches per Hour (kg/hr)	For all Batches (kg)	Process Rate for all Batches (kg/hr)	For all Batches (kg)	Process Rate for all Batches (kg/hr)
Batches 1-12	12	3465.13	173.26	1815.64	90.8	1649.46	82.47	616.64	30.83

METHODOLOGY FOR DETERMING PROCESS RATES AND MASSES:
Weight per batch for Solutions, Solids, and Oxides fare based on stoichiometry. Assume 100% evaporation of water and 100% conversion to oxides
Weight Water Evaporated for all batches (kg) = Solution Weight for all Batches (kg) - Solid Weight for all Batches (kg/batch)
Weight per hour (kg/hr) = Weight (kg/batches) / Batch Time (hours)

Abatement System Calculations:

Percent Product Captured in Collection System[1]	95%
Percent of Solids to Abatement System	60.3%
Percent of Oxides to Abatement System	19.6%
Batch Time (hours) =	20

Batch	Solids Weight (kg)	Oxides Weight (kg)	Fraction Oxides to Solids	Solids to Abatement (kg)	Oxides to Abatement (kg)	[3]Water to Abatement (kg)	[4]NO Formed (kg)	[4]NO_2 Formed (kg)	% NO/NO2 Generated in CSP vs Kiln	[4]NO to Abatement (kg)	[4]NO_2 to Abatement (kg)
Batches 1-12	1815.65	616.64	0.34	72.90	6.04	1649.46	64.65	396.54	99%	64.0035	392.5745

Batch	Solids to Abatement (kg/hr)	Oxides to Abatement (kg/hr)	[5]Weight % Mn in Solids	[5]Weight % Ni in Solids	[5]Weight % Total HAPs in Solids	[5]Weight % Mn in Oxides	[5]Weight % Ni in Oxides	[5]Weight % Total HAPs in Oxides
Batches 1-12	3.6	0.30	6.13%	16.37%	16.37%	23.83%	51.16%	51.16%

Batch	Mn to Abatement (kg/hr)	Ni to Abatement (kg/hr)	Total HAPs to Abatement (kg/hr)	Water to Abatement (kg/hr)	NO to Abatement (kg/hr)	NO_2 to Abatement (kg/hr)	NOx to Abatement (kg/hr)	PM/PM10/PM2.5 to Abatement (lbs/hr)	Mn to Abatement (lbs/hr)	Ni to Abatement (lbs/hr)	Total HAPs to Abatement (lbs/hr)	NOx to Abatement (lbs/hr)
Batches 1-12	0.37	0.75	0.75	82.47	3.20	19.63	22.83	8.04	0.81	1.65	1.65	50.33

Batch	Uncontrolled PM/PM10/PM2.5 Emissions (tons/yr)	Uncontrolled Mn HAP Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Uncontrolled Total HAP Emissions (tons/yr)	Uncontrolled NOx Emissions (tons/yr)	Dust Collector Control Efficiency	Controlled PM/PM10/PM2.5 Emissions (tons/yr)	Controlled Mn Emissions (tons/yr)	Controlled Ni Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)	SCR Control Efficiency	Controlled NOx Emissions (tons/yr)
Batches 1-12	35.20	3.55	7.25	7.25	220.44	99.5%	0.18	0.02	0.036	0.04	90%	22.04

PM, PM10, and PM2.5 Limitations		
	lb/hr	ton/yr
PSD and FESOP Required limitations	2.28	10.00

326 2-8 FESOP Required control efficiency	18.4%	179.88
	lb/hr	ton/yr
326 2-8 FESOP Required limitations	13.49	59.08

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC-020A	4,000	0.0012	YES

[1]The product in the dryer is captured by a collection system. Any product not captured goes to the abatement system.
[2]Based on a similar process, it is known that in the 5% air escaping, a smaller percentage of the solids and oxides are present in the escaped air than what is present in the captured product. 60.3% of the total solids and 19.6% of oxides will be in the 5% air to abatement.
[3]Assume 100% evaporation of water in dryers
[4]NO and NO_2 generated per batch is based on a similar process at another Praxair facility. This value is based on an air flowrate of 1,000 cfm and known air compositions of 450 ppm NO and 1,920 ppm NO
[5]Based on worst-case HAP contents of batches.

METHODOLOGY FOR ABATEMENT SYSTEM CALCS:
Solids and oxides weights from "Process Rates and Masses" above.
Fraction Oxides to Solids = Theoretical Oxides Weight (kg) / Theoretical Solids Weight (kg)
Solids to Abatement (kg) = Solids Weight (kg) x (1- Percent Captured in Collection System) x Percent of Solids to Capture System

NO/NO2 to Abatement (kg) = NO/NO2 Formed (kg) x % NO/NO2 Generated in CSP vs. Kiln
*Note: 99% of the nitrates are reacted in the CSP, and the remaining 1% is reacted in the kiln.
Solids/Oxides/Water/NO/NO2 to Abatement (kg/hr) = Solids/Oxides/Water/NO/NO2 to Abatement (kg) / Batch Time (hours)
HAP to Abatement (kg/hr) = [Solids to Abatement (kg/hr) x Weight % HAP in Solids] + [Oxides to Abatement (kg/hr) x Weight % HAP in Oxides]
NOx to Abatement (kg/hr) = NO to Abatement (kg/hr) + NO2 to Abatement (kg/hr)
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flowrate of control device (dscf/min) x 1 lb/7000 gr x 60 min/hr
Emissions to Abatement (lbs/hr) = Emissions to Abatement (kg/hr) x (2.20462 lbs/kg)
Uncontrolled Emissions (tons/yr) = Emissions to Abatement (lbs/hr) x (8,760 hrs/yr) / (2,000 lbs/ton)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) x (1-Control Efficiency)

Appendix A: Emissions Summary
Combustion Spray Pyrolysis (CSP) Operation

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Calculation of Process Rates and Masses

Batch Time (hours) = 20

Batch	Number of Batches	Solution Weight		Solids Weight		Weight Water Evaporated in Dryer		Oxides Weight	
		Weight for All Batches (kg)	Process Rate for all Batches (kg/hr)	For all Batches (kg)	For all Batches per Hour (kg/hr)	For all Batches (kg)	Process Rate for all Batches (kg/hr)	For all Batches (kg)	Process Rate for all Batches (kg/hr)
Batches 5 and 6	2	1155.04	57.75	605.23	30.26	549.82	27.49	205.55	10.28

METHODOLOGY FOR DETERMINING PROCESS RATES AND MASSES:
Weight per batch for Solution, Solids, and Oxides are based on stoichiometry. Assume 100% evaporation of water and 100% conversion to oxides.
Weight Water Evaporated for all batches (kg) = Solution Weight for all Batches (kg) - Solid Weight for all Batches (kg/batch)
Weight per hour (kg/hr) = Weight (kg/batches) / Batch Time (hours)

Abatement System Calculations:

Percent Product Captured in Collection System	95%
Percent of Solids to Abatement System[2]	60.3%
Percent of Oxides to Abatement System[2]	19.6%
Batch Time (hours) =	20

Batch	Solids Weight (kg)	Oxides Weight (kg)	Fraction Oxides to Solids	Solids to Abatement (kg)	Oxides to Abatement (kg)	[3]Water to Abatement (kg)	[4]NO Formed (kg)	[4]NO_2 Formed (kg)	% NO/NO2 Generated in CSP vs Kiln	[4]NO to Abatement (kg)	[4]NO_2 to Abatement (kg)
Batches 5 and 6	605.23	205.55	0.34	24.30	2.01	549.82	21.55	132.16	99%	21.3345	130.8362

Batch	Solids to Abatement (kg/hr)	Oxides to Abatement (kg/hr)	[5]Weight % Mn in Solids	[5]Weight % Ni in Solids	[5]Weight % Total HAPs in Solids	[5]Weight % Mn in Oxides	[5]Weight % Ni in Oxides	[5]Weight % Total HAPs in Oxides
Batches 5 and 6	1.2	0.10	6.13%	16.37%	16.37%	23.53%	51.16%	51.16%

Batch	Mn to Abatement (kg/hr)	Ni to Abatement (kg/hr)	Total HAPs to Abatement (kg/hr)	Water to Abatement (kg/hr)	NO to Abatement (kg/hr)	NO_2 to Abatement (kg/hr)	NOx to Abatement (kg/hr)	PM/PM10/PM2.5 to Abatement (lbs/hr)	Mn to Abatement (lbs/hr)	Ni to Abatement (lbs/hr)	Total HAPs to Abatement (lbs/hr)	NOx to Abatement (lbs/hr)
Batches 5 and 6	0.12	0.25	0.25	27.49	1.066725	6.54181	7.608535	2.66	0.27	0.55	0.55	16.78

Batch	Uncontrolled PM/PM10/PM2.5 Emissions (tons/yr)	Uncontrolled Mn HAP Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Uncontrolled Total HAP Emissions (tons/yr)	Uncontrolled NOx Emissions (tons/yr)	Dust Collector Control Efficiency	Controlled PM/PM10/PM2.5 Emissions (tons/yr)	Controlled Mn Emissions (tons/yr)	Controlled Ni Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)	SCR Control Efficiency	Controlled NOx Emissions (tons/yr)
Batches 5 and 6	11.73	1.18	2.42	2.42	73.48	99.5%	0.06	0.01	0.012	0.01	90%	7.35

PM, PM10, and PM2.5 Limitations		
	lb/hr	ton/yr
PSD and FESOP Required limitations	2.28	10.03

326 2-8 FESOP Required control efficiency	18.4%	59.96
	lb/hr	ton/yr
326 2-8 FESOP Required limitations	13.70	59.99

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC-020A	4,000	0.0034	YES

[1]The product in the dryer is captured by a collection system. Any product not captured goes to the abatement system.
[2]Based on a similar process, it is known that in the 5% escaping, a smaller percentage of the solids and oxides are present in the escaped air than what is present in the captured product. 60.3% of the total solids and 19.6% of oxides will be in the 5% to abatement.
[3]Assume 100% evaporation of water in dryer.
[4]NO and NO_2 generated per batch is based on a similar process at another Praxair facility. This value is based on an air flow rate of 1,000 cfm and known air compositions of 450 ppm NO and 1,500 ppm NO_2.
[5]Based on worst-case HAP contents of batches.

METHODOLOGY FOR ABATEMENT SYSTEM CALCS:
Solids and oxides weights from "Process Rates and Masses" above.
Fraction Oxides to Solids = Theoretical Oxides Weight (kg) / Theoretical Solids Weight (kg)
Solids to Abatement (kg) = Solids Weight (kg) x (1- Percent Captured in Collection System) x Percent of Solids to Capture System

NO/NO2 to Abatement (kg) = NO/NO2 Formed (kg) x % NO/NO2 Generated in CSP vs. Kiln
*Note: 99% of the nitrates are reacted in the CSP and the remaining 1% is reacted in the Kiln.
Solids/Oxides/Water/NO/NO2 to Abatement (kg/hr) = Solids/Oxides/Water/NO/NO2 to Abatement (kg) / Batch Time (hours)
HAP to Abatement (kg/hr) = [Solids to Abatement (kg/hr) x Weight % HAP in Solids] + [Oxides to Abatement (kg/hr) x Weight % HAP in Oxides]
NOx to Abatement (kg/hr) = NO to Abatement (kg/hr) + NO2 to Abatement (kg/hr)
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x airflow rate of control device (dscf/min) x 1 lb/7000 gr x 60 min/hr
Emissions to Abatement (lbs/hr) = Emissions to Abatement (kg/hr) x (2.20462 lbs/kg)
Uncontrolled Emissions (tons/yr) = Emissions to Abatement (lbs/hr) x (8,760 hrs/yr) / (2,000 lbs/ton)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) x (1-Control Efficiency)

Appendix A: Emissions Summary
Burner Associated with EU020

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Heat Input Capacity MMBtu/hr	
Burner #1	0.4
Burner #2	0.4
Total:	0.80

Potential Throughput

MMCF/yr
6.87

	Pollutant						
	PM*	PM10*	PM2.5	SO_2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.01	0.03	0.03	0.00	0.34	0.02	0.29
Control Efficiency (%)	99.5%	99.5%	99.5%	0%	90%	0%	0%
Controlled Emissions in tons/yr	0.00	0.00	0.00	0.00	0.03	0.02	0.29

*PM emission factor is filterable PM only. PM10 & PM2.5 emission factors are filterable and condensable fractions combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	7.21E-06	4.12E-06	2.58E-04	6.18E-03	1.17E-05

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	1.72E-06	3.78E-06	4.81E-06	1.31E-06	7.21E-06

The five highest organic and metal HAPs emission factors are provided above. **Total HAPs: 6.48E-03**

METHODOLOGY

Note: The CSP Burner is routed to an abatement system with a dust collector (particulate control eff = 99.5%) and an SCR (NOx control eff = 90%).
All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04 (AP-42 Supplement D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
Controlled Emissions (tons/yr) = Emissions (tons/yr) x (1- Control Efficiency)
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (2
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Burner Associated with EU020

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Heat Input Capacity MMBtu/hr	
Burner #3	0.4
Burner #4	0.4
Burner #5	0.4
Total:	1.20

Potential Throughput

MMCF/yr
10.31

	Pollutant						
	PM*	PM10*	PM2.5	SO_2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.01	0.04	0.04	0.00	0.52	0.03	0.43
Control Efficiency (%)	99.5%	99.5%	99.5%	0%	90%	0%	0%
Controlled Emissions in tons/yr	0.00	0.00	0.00	0.00	0.05	0.03	0.43

*PM emission factor is filterable PM only. PM10 & PM2.5 emission factors are filterable and condensable fractions combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

	HAPs - Organics				
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03
Potential Emission in tons/yr	1.08E-05	6.18E-06	3.86E-04	9.28E-03	1.75E-05

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	2.58E-06	5.67E-06	7.21E-06	1.96E-06	1.08E-05

The five highest organic and metal HAPs emission factors are provided above. **Total HAPs: 9.72E-03**

METHODOLOGY

Note: The CSP Burner is routed to an abatement system with a dust collector (particulate control eff = 99.5%) and an SCR (NOx control eff = 90%).
All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu
Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04 (AP-42 Supplement D 3/98)
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
Controlled Emissions (tons/yr) = Emissions (tons/yr) x (1- Control Efficiency)
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (29
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
EU020 Powder Handling After CSP

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Percent Product Captured in Collection System[1] 95%
Batch Time (hours) = 20

Batch	Solids Weight (kg)	Oxides Weight (kg)	Total Powder (kg)	Total Powder Captured (kg)	Powder Throughput (lbs/hr)	Weight % Mn in Solids	Weight % Ni in Solids	Weight % Mn in Oxides	Weight % Ni in Oxides	Weight % Mn in Powder	Weight % Ni in Powder
Batches 1-12	1815.68	616.64	2432.31	2310.70	254.71	8.13%	16.37%	23.53%	51.18%	12.03%	25.19%

[1]The powder product is captured by a collection system. Any product not captured goes to the abatement system.
[2]See "Emission Calculations for CSP" for reference in determining manganese and nickel compositions.
See "Emission Calculations for CSP" for reference in determining powder from CSP.

Batch	Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	Mn Composition (Weight %)	Ni Composition (Weight %)	Uncontrolled Mn HAP Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Batches 1-12	254.71	0.0069	0.0033	0.0038	0.0018	12.03%	25.19%	4.63E-04	9.70E-04	9.70E-04

Batch	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)	Controlled Mn HAP Emissions (tons/yr)	Controlled Ni Emissions (tons/yr)	Total Controlled HAP Emissions (tons/yr)
Batches 1-12	99.9%	0.000004	0.000002	4.63E-07	9.70E-07	9.70E-07

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC-033	4,000	0.0000	YES

METHODOLOGY:
Powder Throughput (lbs/hr) = Total Powder Captured (kg) x (2.20462 lbs/kg) / Batch Time
Weight % HAP in powder = [(Solids Weight (kg) x Weight % HAP in Solids) + (Oxides Weight (kg) x Weight % HAP in Oxides)] / (Solids Weight (kg) + Oxides Weight (kg))
Total HAPs are based on worst-case HAP.
*Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

*Note: Emissions are controlled by a dust collector with a control efficiency of 99.9%.

Appendix A: Emissions Summary
EU020- Powder Handling After Kiln

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch	Powder Handling after CSP Throughput (lbs/hr)	PM Emissions Handling after CSP (lbs/hr)	Powder Handling after Kiln Throughput (lbs/hr)
Batches 1-12	254.71	0.00086	254.71

Batch	Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Batches 1-12	254.71	0.0069	0.0033	0.0038	0.0018	12.03%	25.19%	4.63E-04	9.70E-04	9.70E-04

Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)	Controlled Mn Emissions (tons/yr)	Controlled Ni Emissions (tons/yr)	Controlled HAP Emissions (tons/yr)
99.9%	0.0000	0.00000	0.00	0.00	0.00

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC033	4,000	0.00	YES

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)

METHODOLOGY:
Throughput (lbs/hr) = Powder Handling after CSP Throughput (lbs/hr) - [CSP PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]
*Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
Total HAPs are based on worst-case HAP.
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

*Note: Emissions are controlled by a dust collector with a control efficiency of 99.9%.

Appendix A: Emissions Summary
Enclosed Mills 1 to 3

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch	Powder Handling after Kiln Throughput (lbs/hr)	PM Emissions Handling after Kiln (lbs/hr)	Milling Throughput (lbs/hr)
Batches 1-12	254.71	0.00088	254.71

Batch	Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Batches 1-12	254.71	76.00	64.60	42.39	36.03	12.03%	25.19%	5.10	9.08	9.08

Batch	[2]Controlled PM Emissions (tons/yr)	[2]Controlled PM10/PM2.5 Emissions (tons/yr)	[2]Controlled Mn Emissions (tons/yr)	[2]Controlled Ni Emissions (tons/yr)	[2]Total Controlled HAP Emissions (tons/yr)
Batches 1-12	2.12	1.80	0.26	0.45	0.71

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)
[2]The milling operation is completely enclosed. Any emissions from milling would be during loading and unloading. Unloading and loading is already accounted for in "Powder Handling after Kiln" and Powder Handling After Milling" calculations.

METHODOLOGY:
Throughput (lbs/hr) = Powder Handling after Kiln Throughput (lbs/hr) - [Handling after Kiln PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]
Emission factors for PM and PM10/2.5 from WebFIRE, SCC 3-05-00802 for Crushing, Grinding, & Milling during Ceramic Clay/Tile Manufacture
Total HAPs are based on worst-case HAP.
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Enclosed Mills

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Process	Milling Throughput (lbs/hr)
Four (4) Enclosed Post Kiln Mills 6 to 9	120.00
Two (2) enclosed pre-kiln mills 4 and 5	169.80
Total	289.80

Process	Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Six (6) Enclosed Kiln Mills	289.80	76.00	64.60	48.23	41.00	12.03%	25.19%	5.80	10.33	10.33

Process	[2]Controlled PM Emissions (tons/yr)	[2]Controlled PM10/PM2.5 Emissions (tons/yr)	[2]Controlled Mn Emissions (tons/yr)	[2]Controlled Ni Emissions (tons/yr)	[2]Total Controlled HAP Emissions (tons/yr)
Six (6) Enclosed Kiln Mills	2.41	2.05	0.29	0.52	0.81

PM Limitations	lb/hr	ton/yr
PSD and FESOP Required limitations	1.14	5.00

Haps	lb/hr	ton/yr
PSD and FESOP Required limitations	0.46	2.00

PM10 and PM2.5 Limitations	lb/hr	ton/yr
PSD and FESOP Required limitations	0.68	3.00

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)
[2]The milling operation is completely enclosed. Any emissions from milling would be during loading and unloading. Unloading and loading is already accounted for in "Powder Handling after Kiln" and Powder Handling After Milling" calculations.

METHODOLOGY:
Throughput (lbs/hr) = Powder Handling after Kiln Throughput (lbs/hr) - [Handling after Kiln PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]
Emission factors for PM and PM10/2.5 from WebFIRE, SCC 3-05-00802 for Crushing, Grinding, & Milling during Ceramic Clay/Tile Manufacture
Total HAPs are based on worst-case HAP.
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
EU020- Powder Handling After Mill

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch	Milling Throughput (lbs/hr)	Milling PM Emissions (lbs/hr)	Powder Handling after Milling Throughput (lbs/hr)
Batches 1-12	254.71	9.68	245.03

Batch	Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Batches 1-12	245.03	0.0069	0.0033	3.70E-03	1.77E-03	12.03%	25.19%	4.46E-04	9.33E-04	9.33E-04

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)

Batch	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)	Controlled Mn HAP Emissions (tons/yr)	Controlled Ni HAP Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)
Batches 1-12	99.9%	3.70E-06	1.77E-06	4.46E-07	9.33E-07	9.33E-07

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC033	4,000	0.00	YES

METHODOLOGY:
Throughput (lbs/hr) = Milling Throughput (lbs/hr) - [Milling PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]
*Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
Total HAPs are based on worst-case HAP.
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

*Note: Emissions are controlled by a dust collector with a control efficiency of 99.9%.

Appendix A: Emissions Summary
EU020- Powder Handling After Mill

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Process	Milling Throughput (lbs/hr)	Milling PM Emissions (lbs/hr)	Powder Handling after Milling Throughput (lbs/hr)
Handling After Mill	120.00	11.01	108.99

Process	Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Handling After Mill	108.99	0.0069	0.0033	1.65E-03	7.88E-04	12.03%	25.19%	1.98E-04	4.15E-04	4.15E-04

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)

Process	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)	Controlled Mn HAP Emissions (tons/yr)	Controlled Ni HAP Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)
Handling After Mill	99.9%	1.65E-06	7.88E-07	1.98E-07	4.15E-07	4.15E-07

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC033	4,000	0.00	YES

METHODOLOGY:
Throughput (lbs/hr) = Milling Throughput (lbs/hr) - [Milling PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]
*Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
Total HAPs are based on worst-case HAP.
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

*Note: Emissions are controlled by a dust collector with a control efficiency of 99.9%.

Appendix A: Emissions Summary
EU020- Final Powder Handling

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch	Powder Handling after Milling Throughput (lbs/hr)	Powder Handling After Milling PM Emissions (lbs/hr)	Final Powder Handling Throughput (lbs/hr)
Batches 1-12	245.03	0.00085	245.03

Batch	Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Batches 1-12	245.03	0.0069	0.0033	0.0037	0.0018	12.03%	25.19%	9.33E-04	9.33E-04	9.33E-04
	245.03									

Batch	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)	Controlled Mn Emissions (tons/yr)	Controlled Ni Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)
Batches 1-12	99.9%	3.70E-06	1.77E-06	9.33E-07	9.33E-04	9.33E-07

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC033	4,000	0.00	YES

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)

METHODOLOGY:

Throughput (lbs/hr) = Powder Handling after Milling Throughput (lbs/hr) - [Powder Handling after Milling PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]

*Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer

Total HAPs are based on worst-case HAP.

326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)

Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)

Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

*Note: Emissions are controlled by a dust collector with a control efficiency of 99.9%.

Appendix A: Emissions Summary
EU020- Final Powder Handling

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Batch	Powder Handling after Milling Throughput (lbs/hr)	Powder Handling After Milling PM Emissions (lbs/hr)	Final Powder Handling Throughput (lbs/hr)
Final Handling	108.99	0.00038	108.99

Batch	Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	[1]Mn Composition (Weight %)	[1]Ni Composition (Weight %)	Uncontrolled Mn Emissions (tons/yr)	Uncontrolled Ni Emissions (tons/yr)	Total Uncontrolled HAP Emissions (tons/yr)
Final Handling	108.99	0.0069	0.0033	0.0016	0.0008	12.03%	25.19%	4.15E-04	4.15E-04	4.15E-04
	108.99									

Batch	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)	Controlled Mn Emissions (tons/yr)	Controlled Ni Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)
Final Handling	99.9%	1.65E-06	7.88E-07	4.15E-07	4.15E-04	4.15E-07

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC030	4,000	0.00	YES

[1]See "Powder Handling after CSP" to determine HAP Composition (Weight %)

METHODOLOGY:

Throughput (lbs/hr) = Powder Handling after Milling Throughput (lbs/hr) - [Powder Handling after Milling PM Emissions (tons/yr) * (2,000 lbs/ton) / 8,760 hrs /yr]

*Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer

Total HAPs are based on worst-case HAP.

326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)

Uncontrolled HAP Emissions (tons/yr) = Uncontrolled PM Emissions (tons/yr) * HAP Composition (Weight %)

Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

*Note: Emissions are controlled by a dust collector with a control efficiency of 99.9%.

Appendix A: Emissions Summary
Building 1511 - Specialty Powders Manufacturing Operations

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1515 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Particulate Matter											
Process ID	Dust Collector	Powder Type	Throughput (lbs/hr)	Dust Collected per Year (lbs/yr)	Hours Operated per Year	Dust Collected per Hour (lbs/hr)	Dust Collector Control Efficiency	HEPA Filter Control Efficiency	Uncontrolled PM Emissions (lb/hr)	Uncontrolled PTE PM (tons/yr)	Controlled PTE PM (tons/yr)
EUS-1	DC041	Powder 1	155.77	11,000	450	37.50	99.5%	99.9%	37.42	145.54	0.03
EUS-2	DC015	Powder 2	122.67	4,077	2,443	1.67	99.5%	99.5%	1.67	7.34	0.04
EUS-7	DC025, DC043	Powder 1	53,333	657	516	1.27	99.0%	99.9%	1.54	7.34	0.04
EUS-3	DC053	Powder 2	42.3	2,500	3,352	0.85	99.7%	99.5%	0.57	3.73	0.02
EUS-3	DC054	Powder 2	42.3	3,120	750	4.22	99.5%	99.5%	4.31	12.90	0.69
EUS-5	DC012, DC013	Powder 3	512.5	23,000	1,000	22.50	99.5%	99.9%	23.13	110.05	0.55
EUS-6B	DC040	Powder 4	52.4	4,000	1,400	2.22	99.5%	99.9%	2.22	6.71	0.05
EUS-6A	DC041	Powder 4	54.2	24,000	2,500	6.41	97.5%	97.5%	6.42	31.16	0.37
EUS-10	DC043, DC044, DC051	Powder 5	500	15,000	4,000	3.75	99.5%	99.9%	3.77	15.14	0.03
EUS-11	DC001	Powder 5	100	75,000	6,000	12.50	95.0%	0.0%	13.14	57.81	2.89
EUS-11A	DC002	Powder 6	100	6,000	2,400	2.50	95.0%	0.0%	2.65	9.81	0.48
EUS-11B	DC044	Powder 6	100	10,000	1,000	10.00	95.0%	99.5%	10.53	45.51	2.91
EUS-15A	DC025	Powder 2	341.45	2,500	7,440	0.34	99.5%	99.9%	0.34	1.50	0.01
EUS-15B	DC050	Powder 2	341.64	3,400	7,125	0.45	99.5%	99.9%	0.47	2.15	0.01
EUS-15C	DC060	Powder 2	341.61	3,500	7,500	0.45	99.5%	99.5%	0.49	2.16	0.01
Scale	DC025	Powder 2	341.64	1,000	3,200	0.47	99.0%	99.5%	0.50	2.16	0.02
EUS-15F	DC059, DC024	Powder 2	341.61	5,400	6,500	0.83	99.5%	99.9%	0.63	2.76	0.01
EUS-15G	DC031, DC057	Powder 2	341.45	1,500	1,500	1.00	99.5%	99.5%	1.01	4.42	0.02
EUS-17	DC033, DC045	Powder 2	6.33	1,500	4,000	0.38	99.5%	99.9%	0.38	1.65	0.01
EUS-22	DC005	Powder 7	21,625	1,000	1,600	0.63	99.5%	84.8%	0.63	2.63	0.01
EUS-23	DC006	Powder 7	45	2,000	1,500	1.33	99.5%	90.5%	1.34	5.87	0.03
EUS-4A	DC007	Powder 6	423.5	3,225	750	4.30	99.5%	99.5%	4.31	18.85	0.02
	DC054			35,000	8,500	6.45	99.5%	99.9%	5.46	24.01	0.12
EUS-12 (High Purity Boron Powder Handling)	DC014	Powder 6	100	-	-	1.00	99.0%	99.9%	1.01	4.42	0.04
EUS-15D	DC074	Powder 2	341.50	5,400	8,500	0.63	99.5%	99.5%	0.63	2.74	0.01
EUS-15E	--**	Powder 2	—	—	—	—	—	—	—	—	—
EUS-15H	DC075	Powder 2	341.65	5,400	8,500	0.63	99.5%	99.5%	0.63	2.75	0.01
EUS-15I	DC030	Powder 2	54.94	1,500	1,500	1.00	99.5%	99.5%	1.01	4.43	0.02
									Total (tons/yr):	565.11	7.94

Controlled HAP Emissions													326 IAC 6.5	
Process ID	Dust Collector	Airflow (acfm)	Number of Stacks	% Cobalt	% Chromium	% Nickel	% Total HAPs*	PTE Cobalt (tons/yr)	PTE Chromium (tons/yr)	PTE Nickel (tons/yr)	Total PTE HAPs (tons/yr)	Controlled PM Emissions (gr/dscf)	Able to Comply with 326 IAC 6.5
EUS-1	DC041	4,000	1	0%	95%	0%	95%	0.00	0.74	0.00	0.74	0.0025	YES
EUS-2	DC015	4,000	1	57%	50%	85%	95%	0.02	0.02	0.02	0.03	0.0023	YES
EUS-7	DC025, DC043	4,000	1	0%	95%	0%	95%	0.00	0.07	0.00	0.03	0.0002	YES
EUS-3	DC053	4,000	1	57%	50%	57%	95%	0.01	0.03	0.01	0.02	0.0029	YES
EUS-3	DC054	4,000	1	50%	50%	95%	95%	0.05	0.65	0.65	0.66	0.0024	YES
EUS-5	DC012, DC013	4,000	1	20%	0%	0%	20%	0.11	0.00	0.00	0.11	0.0037	YES
EUS-6B	DC040	4,000	1	0%	100%	0%	100%	0.00	0.15	0.00	0.15	0.0003	YES
EUS-6A	DC041	4,000	1	0%	100%	0%	100%	0.00	0.15	0.00	0.15	0.0010	YES
EUS-10	DC043, DC044, DC051	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0027	YES
EUS-11	DC001	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0182	YES
EUS-11A	DC002	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0032	YES
EUS-11B	DC044	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0154	YES
EUS-15A	DC025	4,000	1	50%	50%	50%	95%	0.00	0.00	0.00	0.01	0.0021	YES
EUS-15B	DC050	4,000	1	50%	50%	50%	95%	0.01	0.01	0.01	0.01	0.0021	YES
EUS-15C	DC060	4,000	1	50%	50%	50%	95%	0.01	0.01	0.01	0.01	0.0021	YES
Scale	DC025	4,000	1	50%	50%	50%	95%	0.01	0.01	0.01	0.02	0.0021	YES
EUS-15F	DC059, DC024	4,000	1	50%	50%	50%	95%	0.01	0.01	0.01	0.01	0.0021	YES
EUS-15G	DC031, DC057	4,000	1	50%	50%	50%	95%	0.01	0.01	0.01	0.02	0.0021	YES
EUS-17	DC033, DC045	4,000	1	50%	50%	50%	95%	0.00	0.00	0.00	0.01	0.0020	YES
EUS-22	DC005	4,000	1	0%	45%	0%	45%	0.00	0.01	0.00	0.01	0.0021	YES
EUS-23	DC006	4,000	1	25%	5%	0%	45%	0.01	0.00	0.00	0.01	0.0022	YES
EUS-4A	DC007	4,000	1	0%	75%	25%	95%	0.00	0.07	0.02	0.03	0.0022	YES
	DC054	4,000		0%	75%	25%	95%	0.00	0.09	0.09	0.11	0.0025	YES
EUS-12 (High Purity Boron Powder Handling)	DC014	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0023	YES
EUS-15D	DC074	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0021	YES
EUS-15E	--**	4,000	1	50%	50%	50%	95%	—	—	—	—	—	—
EUS-15H	DC075	4,000	1	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.0021	YES
EUS-15I	DC030	4,000	1	50%	50%	50%	95%	0.01	0.01	0.01	0.02	0.0021	YES
			27				Total (tons/yr):	0.25	1.37	0.11	1.41		

Notes:
*Total HAPs [illegible] determined by subtracting the [illegible] of the non-HAP [illegible] in the MSDS from 100%
** There are [illegible] processes that are not hooked to [illegible] dust collectors. These units are [illegible] powder. Any emissions from [illegible] will be associated with the other specialty powders manufacturing operations.
This source is only subject to the [illegible] limitations. The [illegible] are for calculation purposes only and are not federally enforceable [illegible]
326 IAC 6.5 [illegible] (0.03 gr/dscf) [illegible] 1,000 [illegible]
All dust collectors have been determined to be integral.

Methodology:
[illegible] PTE for PM is calculated for 326 IAC 2-2 (PSD) purposes only. The dust collectors are integral to the processes for 326 IAC 2-7 (Part 70).
HAP PTE is based on controlled emissions because the dust collectors are integral to the processes and these HAPs are not specifically regulated [illegible] 326 IAC 2-2 (PSD).
Uncontrolled Particulate Emissions (tons/yr) = Dust Collected per Hour (lb/hr) / (Dust Collector Control Efficiency) x 8,760 hr/yr / 2,000 lb/ton
PTE Particulate (tons/yr) = Uncontrolled Particulate Emissions (tons/yr) x (1 - Dust Collector Control Eff)
PTE HAP (tons/yr) = PTE Particulate (tons/yr) x HAP Content (%)
HAP Content is based on worst-case content for each powder type

Appendix A: Emissions Summary
Grit Blasting

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emission Factors for Abrasives

Abrasive	Emission Factor	
	lb PM / lb abrasive	lb PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel shot	0.004	0.86
Other	0.010	0.70

Location	Grit Blaster ID	Dust Collector ID	Grit Type	Max Throughput (lb/hr)	PM Emission Factor (lb/lb grit)	PM10/PM2.5 Emission Factor (lb/lb PM)	Dust Collector Control Efficiency	Uncontrolled Potential PM Emissions (tons/yr)	Uncontrolled Potential PM10 & PM2.5 Emissions (tons/yr)	Controlled Potential PM Emissions (tons/yr)	Controlled Potential PM10 & PM2.5 Emissions (tons/yr)
1245 Main Street	EU09C	C09C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU001G	C001G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU002G	C002G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU004G	C004G	Aluminum Oxide	600	0.010	0.007	99.97%	26.28	18.40	0.01	0.01
	EU005G	C005G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU006G	C006G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU010G	C010G	Aluminum Oxide	600	0.010	0.007	99.97%	26.28	18.40	0.01	0.01
	EU011G	C011G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU013G	C013G	Aluminum Oxide	200	0.010	0.007	99%	8.76	6.13	0.09	0.06
	EU014G	C014G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU015G	C015G	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU016G	C016G	Aluminum Oxide	600	0.041	0.0287	99%	107.75	75.42	1.08	0.75
	EU0[illegible]G	C01[illegible]G	Aluminum Oxide	600	0.041	0.0287	99%	107.75	75.42	1.08	0.75
	EU007G	C007G	Silicon Carbide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU012G	C012G	Aluminum Oxide	50	0.010	0.007	99%	2.19	1.53	0.02	0.02
	EU01M	C01M	Fine Grit	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU02M	C02M	Fine Grit	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU01L	C01L	Shot Peen	5.35	0.004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	EU01GB	C01GB	Glass Bead	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU02GB	C02GB	Glass Bead	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU021G	CS021G	Aluminum Oxide	120	0.010	0.007	99%	5.26	3.68	0.05	0.04
	EU02L	DS02L	Shot Peen	5.35	0.004	0.00344	99%	0.09	0.08	0.00	0.00
1415 Main Street	EU01C	C01C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU04C	C04C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU05C	C05C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU06C	C06C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU07C	C07C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU08C	C08C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU10C	C10C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU12C	C12C	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	EU16C	C16C	Aluminum Oxide	600	0.010	0.007	99.7%	26.28	18.40	0.07	0.05
	EU03C	C03C	Aluminum Oxide	360	0.010	0.007	99%	15.77	11.04	0.16	0.11
	EU01M	C03M	Aluminum Oxide	600	0.010	0.007	99%	26.28	18.40	0.26	0.18
	01F1 EUG6	CG6	Aluminum Oxide	173	0.010	0.007	99.7%	7.58	5.30	0.02	0.02
	01F1 EUG7	CG7	Aluminum Oxide	81	0.010	0.007	99.7%	3.55	2.48	0.01	0.01
	02F1 EUG1	CG1/2	Aluminum Oxide	224	0.010	0.007	99.7%	9.81	6.87	0.03	0.02
	02F1 EUG2		Aluminum Oxide	224	0.010	0.007	99.7%	9.81	6.87	0.03	0.02
	02F1 EUG3	CG3/4	Aluminum Oxide	81	0.010	0.007	99.7%	3.55	2.48	0.01	0.01
	02F1 EUG4	CG5	Aluminum Oxide	50	0.010	0.007	99.7%	2.19	1.53	0.01	0.00
	03F3 EUG1	CG1	Calcined Alumina	221	0.010	0.007	99.7%	9.68	6.78	0.03	0.02
	03F3 EUG2	CG2	Calcined Alumina	221	0.010	0.007	99.7%	9.68	6.78	0.03	0.02
	EU11C	C11C	Silicon Carbide	173	0.010	0.007	99.0%	7.58	5.52	0.08	0.05
	EU01	C01	Aluminum Oxide	50	0.010	0.007	99.7%	2.19	1.53	0.01	0.00
1500 Polco Street	EU12C	C12C	Aluminum Oxide	129	0.010	0.007	99.7%	5.65	3.96	0.02	0.01
							Total PTE (tons/yr):	**881.62**	**637.27**		
									Total Controlled PTE (tons/yr):	**7.66**	**5.59**

Appendix A: Emissions Summary
Grit Blasting

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

							PSD Minor Limits		FESOP Limits	
Location	Number of Blasters	Grit Blaster ID	Control ID	Airflow (acfm)	Controlled PM Emissions (gr/dscf)	Able to Comply with 326 IAC 6-3	PSD PM Limit (lb/hr)	PSD PM Limit (tons/yr)	FESOP PM10 & PM2.5 Limit (lb/hr)	FESOP PM10 & PM2.5 Limit (tons/yr)
1245 Main Street	1	EU092	C092	4,600	0.0011	YES	0.50	2.17	0.09	0.36
	1	EU036G	C036G	4,600	0.0016	YES	0.50	2.17	0.09	0.35
	1	EU022G	C022G	4,600	0.0016	YES	0.50	2.17	0.09	0.35
	1	EU024G	C024G	4,600	0.0201	YES	0.50	2.17	0.09	0.36
	1	EU033G	C033G	4,600	0.0118	YES	0.50	2.17	0.09	0.35
	1	EU015G	C015G	4,600	0.0015	YES	0.50	2.17	0.09	0.37
	1	EU016G	C016G	4,600	0.0201	YES	0.50	2.17	0.09	0.36
	1	EU011G	C011G	4,600	0.0016	YES	0.50	2.17	0.09	0.35
	1	EU013G	C013G	4,600	0.0015	YES	0.50	2.17	0.09	0.35
	1	EU014G	C014G	4,600	0.0015	YES	0.50	2.17	0.09	0.35
	1	EU015G	C015G	4,600	0.0118	YES	0.50	2.17	0.09	0.35
	1	EU018G	C018G	4,600	0.0072	YES	0.50	2.17	0.09	0.39
	1	EU019G	C019G	4,600	0.0072	YES	0.50	2.17	0.09	0.36
	1	EU012G	C012G	4,600	0.0251	YES	0.50	2.17	0.09	0.35
	1	EU007G	C007G	4,600	0.0011	YES	0.50	2.17	0.09	0.35
	1	EU01M	C01M	4,600	0.0015	YES	0.50	2.17	0.09	0.35
	1	EU02M	C02M	4,600	0.0015	YES	0.50	2.17	0.09	0.35
	1	EU01L	C01L	4,600	0.0160	YES	0.50	2.17	0.09	0.35
	1	EU01GB	C01GB	4,600	0.0016	YES	0.50	2.17	0.09	0.36
	1	EU02GB	C02GB	4,600	0.0056	YES	0.50	2.17	0.09	0.32
	1	EU021G	DC021G	4,600	0.0004	YES	0.50	2.17	0.09	0.35
	1	EU02L	DC02L	4,600	0.0030	YES	0.50	2.17	0.09	0.35
1415 Main Street	1	EU01C	C01C	4,600	0.0011	YES	0.50	2.17	0.09	0.35
	1	EU04C	C04C	4,600	0.0011	YES	0.50	2.17	0.09	0.35
	1	EU05C	C05C	4,600	0.0011	YES	0.50	2.17	0.09	0.35
	1	EU06C	C06C	4,600	0.0011	YES	0.50	2.17	0.09	0.35
	1	EU07C	C07C	4,600	0.0011	YES	0.50	2.17	0.09	0.36
	1	EU08C	C08C	4,600	0.0011	YES	0.50	2.17	0.09	0.35
	1	EU10C	C10C	4,600	0.0011	YES	0.50	2.17	0.09	0.36
	1	EU12C	C12C	4,600	0.0019	YES	0.50	2.17	0.09	0.35
	1	EU16C	C16C	4,600	0.0025	YES	0.50	2.17	0.09	0.36
	1	EU03C	C03C	4,600	0.0011	YES	0.50	2.17	0.09	0.36
	1	EU01M	C01M	4,600	0.0010	YES	0.50	2.17	0.09	0.32
	1	O1F1 EUG6	CG6	4,600	0.0020	YES	0.50	2.17	0.09	0.36
	1	O1F1 EUG7	CG7	4,600	0.0001	YES	0.50	2.17	0.09	0.36
	1	O2F1 EUG1	CG1/2	4,600	0.0002	YES	0.50	2.17	0.09	0.36
	1	O2F1 EUG2		4,600	0.0002	YES	0.50	2.17	0.09	0.36
	1	O2F1 EUG3	CG3/4	4,600	0.0001	YES	0.50	2.17	0.09	0.35
	1	O2F1 EUG5	CG5	4,600	0.0002	YES	0.50	2.17	0.09	0.36
	1	O2F3 EUG1	CG1	4,600	0.0002	YES	0.50	2.17	0.09	0.36
	1	O2F3 EUG2	CG2	4,600	0.0002	YES	0.50	2.17	0.09	0.36
	1	EU11C	C11C	4,600	0.0005	YES	0.50	2.17	0.09	0.35
	1	EU21	C21	4,600	0.0005	YES	0.50	2.17	0.09	0.36
1500 Polco Street	1	EU13C	C13C	4,600	0.0191	YES	0.50	2.17	0.09	0.35
	44					Total PTE (tons/yr):	—	95.65	—	16.77

Methodology
Emission Factors from STAPPA/ALAPCO Air Quality Permits - Vol. 1, Section 3: Abrasive Blasting [illegible]
Potential PTE (tons/yr) = Max Throughput (lb/hr) x Emission Factor (lb/lb grit) x (1 - Control Efficiency) x (8,760 hr/yr) / (2,000 lb/ton)

Notes
[illegible]

Appendix A: Emissions Summary
Vacuum Sealer VS1

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Solvent	Solvent Usage *(gal/yr)*	Density *(lb/gal)*	% VOC	VOC Usage *(gal/yr)*	VOC *(lb/hr)*	VOC *(ton/yr)*
Damisol-3500	55	9.40	100%	55	0.06	0.26
Total					**0.06**	**0.26**

Methodology
Solvent Usage (gal/yr) = Solvent Usage (gal/wk) *52
% VOC and Density (lb/gal) from MSDS sheet
VOC (gal/yr) = Solvent Usage (gal/yr) * % VOC
VOC (ton/yr) = VOC (gal/yr) * Density (lb/gal) * (1 ton/ 2000 lbs)
Solvent contains no HAPs per the SDS.

Appendix A: Emissions Summary
Titanium Powder Processes 1 and 2

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Titanium Process Emissions

Number of Processes =	**2**	
Amount to wet collector =	8.00	lbs/hr
Chromium Content =	2.70%	of particulates
Control Efficiency =	98.00%	

Potential Emissions Before Control

Uncontrolled Particulate Emissions (lb/hr) =	8.00	lbs/hr
Uncontrolled Particulate Emissions (ton/yr) =	35.04	tons/yr
Uncontrolled Chromium Emissions (ton/yr) =	0.95	tons/yr

Potential Emissions After Control

Controlled Particulate Emissions (lb/hr) =	0.16	lbs/hr
Controlled Particulate Emissions (ton/yr) =	0.70	tons/yr
Controlled Chromium Emissions (ton/yr) =	0.02	tons/yr

PSD Limits (PM, PM10, and PM2.5)

Limited Particulate after control (lb/hr) =	0.80	lbs/hr
Limited Particulate after control (ton/yr) =	3.50	tons/yr

FESOP Limits (PM10 and PM2.5)

Limited Particulate after control (lb/hr) =	0.80	lbs/hr
Limited Particulate after control (ton/yr) =	3.50	tons/yr

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
Rotoclone Wet Collector	4,000	0.00	YES

Methodology
Amount to wet collector provided by source.
Uncontrolled Particulate Emissions (lb/hr) = Amount to wet collector (lbs/hr)
Uncontrolled Particulate Emissions (tons/yr) = Uncontrolled Emissions (lb/hr) * 8,760 (hr/yr) * 1/2,000 (ton/lbs)
Uncontrolled Chromium Emissions (ton/yr) = Uncontrolled Partiuclate Emissions (tons/yr) * % Chromium
Controlled Particulate Emissions (lb/hr) = Uncontrolled Particulate Emissions (lb/hr) * (1 - %CE)
Controlled Particulate Emissions (ton/yr) = Controlled Particulate Emissions (lb/hr) * 8,760 * 1/2,000 (ton/lbs)
Controlled Chromium Emissions (ton/yr) = Controlled Partiuclate Emissions (tons/yr) * % Chromium
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/t

Appendix A: Emissions Summary
Tribomet Line #3 (Building 1415)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Tank ID	Materials	Amount in Tank	Units	Amount Added per Month	Units	Total Added per Year (lbs/yr)	Density (lbs/gal)	Estimated Evaporation Rate	Total Emissions (lbs/yr)	VOC Content	HCl Content (%)	Nickel Compound Content (%)	Chromium Compound Content (%)	Uncontrolled PTE VOC (tons/yr)	Uncontrolled PTE HCl (tons/yr)	Uncontrolled PTE Nickel Compounds (tons/yr)	Uncontrolled PTE Chromium Compounds (tons/yr)
2	HCl	33.068783	lbs	1	lbs	12.00	8.56	20%	2.40	0%	35%	0%	0%	0.00	0.00	0.00	0.00
	Nickel Chloride	385.80247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
3	Sulfuric Acid	33.068783	lbs	1	lbs	12.00	15.31	7%	0.84	0%	0%	0%	0%	0.00	0.00	0.00	0.00
5	Nickel Sulfate	275.57319	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	100%	0%	0.00	0.00	0.01	0.00
	Nickel Cloride	38.580247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
	Boric Acid	38.580247	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
	SCBN 60 80 Grit	2.4801587	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
6	Nickel Sulfate	275.57319	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	100%	0%	0.00	0.00	0.01	0.00
	Nickel Cloride	38.580247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
	Boric Acid	33.068783	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
	TM329 Powder	22.045855	lbs	5	lbs	60.00		20%	12.00	0%	0%	0%	70%	0.00	0.00	0.00	0.00
7	Nickel Sulfate	275.57319	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	100%	0%	0.00	0.00	0.01	0.00
	Nickel Cloride	38.580247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
	Boric Acid	33.068783	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
	TM329 Powder	22.045855	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	70%	0.00	0.00	0.00	0.00
8	Nickel Sulfate	275.57319	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	100%	0%	0.00	0.00	0.01	0.00
	Nickel Cloride	38.580247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
	Boric Acid	33.068783	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
	TM329 Powder	22.045855	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	70%	0.00	0.00	0.00	0.00
9	Nickel Sulfate	275.57319	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	100%	0%	0.00	0.00	0.01	0.00
	Nickel Cloride	38.580247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
	Boric Acid	33.068783	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
	TM329 Powder	22.045855	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	70%	0.00	0.00	0.00	0.00
10	Nickel Sulfate	275.57319	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	100%	0%	0.00	0.00	0.01	0.00
	Nickel Cloride	38.580247	lbs	1	lbs	12.00	*	20%	2.40	0%	0%	100%	0%	0.00	0.00	0.00	0.00
	Boric Acid	33.068783	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	0%	0.00	0.00	0.00	0.00
	TM329 Powder	22.045855	lbs	5	lbs	60.00	*	20%	12.00	0%	0%	0%	70%	0.00	0.00	0.00	0.00
													Total Uncontrolled PTE (tons/yr)	**0.00**	**0.00**	**0.04**	**0.02**
													Control Efficiency	**99.50%**	**99.50%**	**99.50%**	**99.50%**
													Total Controlled PTE (tons/yr)	**0.00**	**0.0000**	**0.0002**	**0.0001**

Methodology:

*Density not provided in SDS and/or solid material

**Tanks are changed out once every 2 years.

The Tribomet line #3 is controlled by a scrubber system with a control efficiency of 99.5%.

Total Amount Added Per Year (lbs/yr)

For amounts given in lbs:

Total Amount (lbs/yr) = Amount Added per Month (lbs/month) x (12 months/yr)

Total Emissions = Amount Added per Year (lbs/yr) x Evaporation Rate (%)

Evaporation rate of 20% is a conservative engineering estimate, based on the amount that is added per month compared to the tank contents. The evaporation percentage is not an exact ratio of the amount added divided by the tank contents, because the percentage accounts for the portion of the liquid that remains on the product or is wasted.

Appendix A: Emissions Summary
Degreasing/Solvent Cleaning

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Location	Emission Unit ID	Material	Density (Lb/Gal)	Weight % Volatile (H20 & Organics)	Weight % Water	Weight % Organics	Volume % Water	Max Gal of Mat. Added (gal/yr)	Waste Material (gal/yr)	Pounds VOC per gallon of solvent less water	Pounds VOC per gallon of solvent	Potential VOC tons per year
Cold Cleaner Degreasers												
1245 Main Street	Maintenance Parts Washer	Safety Kleen Solvent	6.80	100.00%	0.0%	100.0%	0.0%	10.00	0.00	6.80	6.80	0.03
1415 Main Street	Maintenance Parts Washer	Safety Kleen Solvent	6.80	100.00%	0.0%	100.0%	0.0%	10.00	0.00	6.80	6.80	0.03
	Operation 1 and 2 Machine Shop Parts Washer	Safety Kleen Solvent	6.80	100.00%	0.0%	100.0%	0.0%	150.00	0.00	6.80	6.80	0.51
Conveyorized Vapor Degreasers												
1415 Main Street	Two (2) Operation 2 Degreasers	Novec 72DE	10.68	100.00%	0.0%	100.0%	0.0%	410.11	0.00	10.68	10.68	2.19
	One (1) Operation 2 Degreaser	Novec 72DE	10.69	100.00%	0.0%	100.0%	0.0%	500.0	0.0	10.69	10.69	2.67
Open Top Vapor Degreasers												
1415 Main Street	LPPS Vapor Degreaser	(n-Propyl Bromide	10.69	100.00%	0.0%	91.0%	0.0%	660.00	82.00	9.91	9.91	2.86
	Internal Line Vapor Degreaser	PCE**	13.59	100.00%	0.0%	100.0%	0.0%	660.00	165.00	0.00	0.00	0.00
		PCE**	13.59	100.00%	0.0%	100.0%	100.0%	250.00	165.00	0.00	0.00	0.00
		Inhibitor Concentrate	10.00	100.00%	0.0%	100.0%	0.0%	20.00	0.00	10.00	10.00	0.10
Manual Degreasing												
1245 Main Street	Manual Degreasing	*MEK	6.76	100.00%	0.0%	100.0%	0.0%	140.00	0.00	6.76	6.76	0.47
	Parts Washer	HDL-125	9.40	100.00%	0.0%	100.0%	0.0%	10.00	0.00	9.40	9.40	0.05
										Total Potential Emissions (tons/yr)		**9.02**

Methodology
Pounds of VOC per Gallon Solvent less Water = (Density (lb/gal) * Weight % Organics) / (1-Volume % water)
Pounds of VOC per Gallon Solvent = (Density (lb/gal) * Weight % Organics)
Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * (Max Gal of Material (gal/yr) - Waste Material (gal/yr)) * (1 ton/2000 lbs)

Notes
*Note: Praxair uses either MEK, IPA, and ZeroTo Heavy-Duty Degreaser in the Building 1245 Manual Degreasing. Therefore, MEK was used because it was worstcase for VOCs.
** Pursuant to 40 CFR 51.100(s)(1), PCE is not a VOC, however, it is considered a HAP.

HAP Emission Calculations

Location	Emission Unit ID	Material	Density	Max Gal of Material	Waste Material	Weight %	Weight %	Weight %	Weight %	Weight %	Weight %	Benzene Emissions	1,2-Epoxybutane Emissions	p-dichloro benzene Emissions	Toluene Emissions	HF Emissions	PCE Emissions
			(Lb/Gal)	(gal/yr)	(gal/yr)	Benzene	1,2-Epoxybutane	p-dichloro benzene	Toluene	HF	PCE	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
Cold Cleaner Degreasers																	
1245 Main Street	Maintenance Parts Washer	Safety Kleen Solvent	6.80	10.00	0.00	0.00005%	0.00%	0.001%	0.004%	0.00%	0.00%	1.65E-06	0.00E+00	2.00E-07	1.35E-06	0.00E+00	0
1415 Main Street	Maintenance Parts Washer	Safety Kleen Solvent	6.80	10.00	0.00	0.00005%	0.00%	0.001%	0.004%	0.00%	0.00%	1.65E-06	0.00E+00	2.00E-07	1.35E-06	0.00E+00	0
	Operation 1 and 2 Machine Shop Parts Washer	Safety Kleen Solvent	6.80	150.00	0.00	0.00005%	0.00%	0.001%	0.004%	0.00%	0.00%	2.97E-07	0.00E+00	3.75E-06	2.25E-05	0.00E+00	0
Conveyorized Vapor Degreasers																	
1415 Main Street	Two (2) Operation 2 Degreasers	Novec 72DE	10.68	410.11	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
	One (1) Operation 2 Degreaser	Novec 72DE	10.69	500.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Open Top Vapor Degreasers																	
1415 Main Street	LPPS Vapor Degreaser	TMC-377	10.65	660.00	82.00	0.00%	1.00%	0.00%	0.00%	25.00%	0.00%	0.00E+00	3.15E-02	0.00E+00	0.00E+00	7.87E-01	0
	Internal Line Vapor Degreaser	PCE**	13.59	660.00	165.00	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.36
		PCE**	13.59	250.00	165.00	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.65
		Inhibitor Concentrate	10	20.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
Manual Degreasing																	
1245 Main Street	Manual Degreasing	*MEK	6.76	140.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
	Parts Washer	HDL-125	9.40	10.00	0.00	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0
								Potential HAP Emissions (tons/yr)				**0.00E+00**	**3.15E-02**	**0.00E+00**	**0.00E+00**	**7.87E-01**	**4.01**
									Combined HAPs (tons/yr)				**4.83**				

METHODOLOGY
HAPS emission rate (tons/yr) = Density (lb/gal) * Max Gal of Material (gal/yr) * Weight % HAP * 1 ton/2000 lbs

LPPS Vapor Degreaser Prior to Modification												
Location	Emission Unit ID	Material	Density (Lb/Gal)	Weight % Volatile (H20 & Organics)	Weight % Water	Weight % Organics	Volume % Water	Max Gal of Mat. Added (gal/yr)	Waste Material (gal/yr)	Pounds VOC per gallon of solvent less water	Pounds VOC per gallon of solvent	Potential VOC tons per year
1415 Main Street	LPPS Vapor Degreaser	Novec 72DE	10.65	100.00%	0.0%	100.0%	0.0%	660.00	82.00	10.68	10.68	3.09

LPPS Vapor Degreaser Prior to Modification																	
Location	Emission Unit ID	Material	Density	Max Gal of Material	Waste Material	Weight %	Weight %	Weight %	Weight %	Weight %	Weight %	Benzene Emissions	1,2-Epoxybutane Emissions	p-dichloro benzene Emissions	Toluene Emissions	Xylene Emissions	PCE Emissions
			(Lb/Gal)	(gal/yr)	(gal/yr)	Benzene	1,2-Epoxybutane	p-dichloro benzene	Toluene	Xylene	PCE	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
1415 Main Street	LPPS Vapor Degreaser	Novec 72DE	10.68	660.00	82.00	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00E+00	6.17E-02	0.00E+00	0.00E+00	0.00E+00	0

Appendix A: Emissions Summary
Dry Ice Blasting - Operation 2 Process 3 (1415 Main Street)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Dry Ice / Air Blasting (O2P3-EUG3)			
Residual Powder (lb/part)	Maximum Production Rate (parts/week)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)
0.5	150	1.95	1.95

METHODOLOGY:
Residual powder is dislodged from parts using a dry ice blasting cabinet.
Uncontrolled PM Emissions (ton/year) = Residual Powder (lb/part) * Maximum Production Rate (parts/week) * 52 weeks/year * (1 ton / 2,000 lbs)

Appendix A: Emissions Summary
Wet Grit Blasting

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emission Factors for Abrasives

Abrasive	Emission Factor lb PM / lb abrasive	Emission Factor lb PM10 / lb PM
Sand	0.041	0.70
Grit	0.010	0.70
Steel Shot	0.004	0.86
Other	0.010	0.70

Location	Grit Blaster ID	Dust Collector ID	Grit Type	Max Throughput (lbs/hr)	PM Emission Factor (lbs/lb grit)	PM10/ PM2.5 Emission Factor (lbs/lb grit)	PM Mitigated by Wet Blasting[1]	Control Efficiency	Potential PM Emissions (tons/yr)	Potential PM10/ PM2.5 Emissions (tons/yr)	Controlled Potential PM Emissions (tons/yr)	Controlled Potential PM10/ PM2.5 Emissions (tons/yr)
1415 Main Street	EU14C*	C14C	Aluminum Oxide	600	---	---	---	---	---	---	---	---
	EU15C	C15C	Aluminum Oxide	600	0.010	0.007	50%	99%	13.14	9.20	0.13	0.09
							Total PTE (tons/yr):		**13.14**	**9.20**		
									Total Controlled PTE (tons/yr):		**0.13**	**0.09**

Location	Number of Blasters	Grit Blaster ID	Dust Collector ID	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5	PSD Minor Limits: PSD PM, PM10, & PM2.5 Limit (lb/hr)	PSD Minor Limits: PSD PM, PM10, & PM2.5 Limit (ton/yr)	FESOP Limits: FESOP PM10 & PM2.5 Limit (lb/hr)	FESOP Limits: FESOP PM10 & PM2.5 Limit (ton/yr)
1415 Main Street	1	EU14C*	C14C	---	---	---	---	---	---	---
	1	EU15C	C15C	4,000	0.0009	YES	0.50	2.19	0.11	0.48
	2						**Total PTE (tons/yr):**	2.19		0.48

Methodology

Emission Factors from STAPPA/ALAPCO "Air Quality Permits", Vol. I, Section 3 "Abrasive Blasting" (1991 edition)

Potential PTE (ton/yr) = Max Throughput (lb/hr) x Emission Factor (lbs/lb grit) x (1- Control Efficiency) x (8,760 hr/yr) / (2,000 lbs/ton)

[1] Per STAPPA/ALAPCO

*No emissions from this wet grit blasting unit was determined in FESOP F097-40276-00060, issued on April 1, 2014

Appendix A: Emissions Summary
Polishing Operation: Powder Handling Operation
(Lens Polish Mixing, Suspension Room Custom Blend Loading, Suspension Room Powder Packaging, Powder Loading)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Total Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/ PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	Uncontrolled PM Emissions (lbs/hr)	Uncontrolled PM10/PM2.5 Emissions (lbs/hr)	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)
9152.86	0.0069	0.0033	0.14	0.07	0.03	0.02	99.5%	0.00	0.00

326 IAC 6.5			
Dust Collector	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
DC030 and DC032	4,000	0.0000	YES

Information from Praxair:

-The throughput is a combined throughput for Lens Polish Mixing Tank Loading, Suspension Room Custom Blend Loading, Suspension Room Powder Packaging, and Premix. There are 4 mixing tanks in Lens Polish, but the throughput is limited to two mixing tanks, based on a bottleneck created by the bottle filling line and the pail filling line. The powder handling operations are controlled by dust collectors with a control efficiency of 99.5%. There are no HAPs in the dry materials used in the Polishing Department.

METHODOLOGY:

*Handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer

Uncontrolled Emissions (tons/yr) = Powder Throughput (lbs/hr) / (2,000 lbs/ton) * EF (lbs/ton) * (8,760 hours/year) / (2,000 lbs/ton)

326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Polishing Operation: Polish Mixing Operation
(Lens Polish Mixing and Filing & Suspension Room Mixing Operation)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Material	Weight % Volatile (H20 & Organics)	Density (Lb/Gal)	Weight % Water & Exempt Solvents	Weight % Organics	Maximum Hourly Throughput (gal/hr)	Pounds VOC per gallon of coating	Emission Rate (% Material Emitted)	VOC Potential (ton/yr)
Lens Polish Mixing Tank 1:								
Material 1	66.00%	8.35	65.9%	0.10%	0.36	0.008	0.89%	0.00
Material 2	80.00%	10.01	79.0%	1.00%	6.69	0.10	0.89%	0.03
Material 3	100.00%	8.68	0.0%	100.00%	24.77	8.68	0.89%	8.40
Potential Emissions for Lens Polish Mixing Tank 1 (tons/yr)								8.43
Lens Polish Mixing Tank 2:								
Material 1	66.00%	8.35	65.9%	0.10%	0.36	0.008	0.89%	0.00
Material 2	80.00%	10.01	79.0%	1.00%	6.69	0.10	0.89%	0.03
Material 3	100.00%	8.68	0.0%	100.00%	24.77	8.68	0.89%	8.40
Potential Emissions for Lens Polish Mixing Tank 2 (tons/yr)								8.43
Suspension Room Mixing Tank:								
Material 3	100.00%	8.68	0.0%	100.00%	1.99	8.68	0.89%	0.67
Material 4	100.00%	8.18	1.0%	99.00%	0.12	8.10	0.89%	0.04
Potential Emissions for Suspension Room Mixing Tank (tons/yr)								0.71
Total Potential Emissions (tons/yr)								**17.56**

Description of Process:

Lens Polish and Suspension Room mixing operations are used to mix various lens polishes. The Suspension Room Mixing operation is a small-scale mixing operation, and the composition of the final product is different than the Lens Polish area. There are other components of the mixtures, but they do not contain VOCs or HAPs.

Max Throughput Description:

-The batch compositions were provided by the facility.

-Maximum gallons of material is based on the usage of each chemical per batch.

-There are 4 mixing tanks in Lens Polish, but the throughput is limited to two mixing tanks, based on a bottleneck created by the bottle filling line and the pail filling line.

-There are 2 suspension room batches every 8 hours (one every 4 hours).

METHODOLOGY

Based on a material balance of the raw material in and product out, the 99.03% of the raw materials remain in the final product. Therefore, 0.97% is lost. Part of the loss is due to waste material remaining on the tank due to surface tension, and the other portion is due to air emissions. The waste remaining in the mixing tank was estimated using the "Instructions for Completing Part II of EPA Form R: Summary of Residue Quantities," and a median point was chosen between water and motor oil (water = 4 cp, motor oil = 94 cp, Material 3 = 46 cp) for dish-bottom steel tanks. The weight % of the drum's capacity that would remain on the tank and be wasted is 0.0785% of the drum's capacity, based on a median between 0.034% for water and 0.191% for motor oil. The weight % of 0.0785% was subtracted from 0.97% to determine that 0.892% of the contents are emitted.

Weight % Water & Exempt Solvents = Weight % Volatile (H20 & Organics) - Weight % Organics

Material compositions are from MSDSs.

Pounds of VOC per Gallon Material = Density (lb/gal) x Weight % Organics

VOC Potential (tons/yr) = Pounds of VOC per Gallon Material (lb/gal) x Max Gal of Material per Batch (gal/hr) / Batch Time (hrs/batch) x Emission Rate (%) x (8,760 hrs/yr) x (1 ton/2000 lbs)

Appendix A: Emissions Summary
Building 1415 - Bader Grinders

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Unit ID	Control Efficiency	Outlet Grain Loading (grains/dscf)	Air Flow Rate (cfm)	PM/PM10/PM2.5 before Controls (lbs/hr)	PM/PM10/PM2.5 before Controls (tons/yr)	PM/PM10/PM2.5 after Controls (lbs/hr)	PM/PM10/PM2.5 after Controls (tons/yr)
Bader Grinder #2	99.70%	0.003	4000	34.29	150.17	0.10	0.45
Bader Grinder #3	99.70%	0.003	4000	34.29	150.17	0.10	0.45
Bader Grinder #4	99.70%	0.003	4000	34.29	150.17	0.10	0.45
				Total:	**450.51**	**Total:**	**1.35**

					PSD Minor Limits		FESOP Limits	
Emissions Units	**Control Unit ID**	**Airflow (acfm)**	**Controlled PM Emissions (gr/ft3)**	**Able to Comply with 326 IAC 6.5**	**PSD PM, PM10, & PM2.5 Limit (lb/hr)**	**PSD PM, PM10, & PM2.5 Limit (ton/yr)**	**FESOP PM10, & PM2.5 Limit (lb/hr)**	**FESOP PM10, & PM2.5 Limit (ton/yr)**
Bader Grinder #2	C03B	4,000	0.00	YES	0.10	0.45	0.10	0.45
Bader Grinder #3	C07B	4,000	0.00	YES	0.10	0.45	0.10	0.45
Bader Grinder #4	C08B	4,000	0.00	YES	0.10	0.45	0.10	0.45
				Total:	—	**1.35**	—	**1.35**

Methodology

PM10 and PM2.5 emissions assumed equal to PM emissions.

PM/PM10/PM2.5 after Controls (lbs/hr) = [Outlet Grain Loading (grains/dscf)] * [Air Flow Rate (cfm)] * [60 min/hr] * [lb/7000 grains]

PM/PM10/PM2.5 after Integral Controls (tons/yr) = [PM/PM10/PM2.5 after Controls (lbs/hr)] * [8760 hr/yr] * [ton/2000 lb]

PM/PM10/PM2.5 before Integral Controls (lbs/hr) = [PM/PM10/PM2.5 after Controls (lbs/hr)] / [1 - control efficiency]

PM/PM10/PM2.5 before Integral Controls (tons/yr) = [PM/PM10/PM2.5 after Controls (tons/yr)] / [1 - control efficiency]

This source is only subject to the pound/hour limitations. The ton/year "limits" are for calculation purposes only and are not federally enforceable limitations.

326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Surface Coating at 1245 Main Street and 1415 Main Street

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

PM, PM10, and PM2.5 Emissions											PSD Limits***		FESOP Limits		6.5 Applicability		
Location	Number of Surface Coaters	Surface Coater ID	Control Device ID	Max Throughput (lbs/hr)	Amount Collected (lbs/hr)	Control Efficiency	HEPA Filter Control Efficiency	Uncontrolled Potential PM Emissions (lbs/hr)	Uncontrolled Potential PM Emissions (tons/yr)	Controlled Potential PM Emissions (tons/yr)	PSD PM PM10 & PM2.5 Limit (lbs/hr)	PSD PM PM10 & PM2.5 Limit (tons/yr)	FESOP PM10 & PM2.5 Limit (lbs/hr)	FESOP PM10 & PM2.5 Limit (tons/yr)	Density of Coating* (lbs/gal)	Gallons of Coating Per Day (gal/day)	Applicable
Detonation Surface Coating Stations subject to NESHAP 6W																	
1245 Main Street	1	EU01A	C01A	32.16	21.7	99.97%	99.99%	21.71	95.07	2.85E-06	—	—	—	—	100	7.72	YES
	1	EU02A	C02A	32.16	21.7	99.97%	99.99%	21.71	95.07	2.85E-06	—	—	—	—	100	7.72	YES
	1	EU16A	C16A	32.16	21.7	99.97%	99.99%	21.71	95.07	2.85E-06	—	—	—	—	100	7.72	YES
	1	EU17A	C17A	32.16	21.7	99.97%	99.99%	21.71	95.07	2.85E-06	—	—	—	—	100	7.72	YES
	1	EU18A	C18A	32.16	21.7	99.97%	99.99%	21.71	95.07	2.85E-06	—	—	—	—	100	7.72	YES
	1	EU05A	C05A	32.16	21.7	99.97%	99.99%	21.71	95.07	2.85E-06	—	—	—	—	100	7.72	YES
Low Pressure Plasma Spray Coating Station subject to NESHAP 6W																	
1415 Main Street	1	EU01S	C01S**	44.02	0.00	99.97%	—	0.00	0.07	3.91E-06	—	—	—	—	100	10.56	YES
High Velocity Oxy Fuel Coating Stations subject to NESHAP 6W																	
1245 Main Street	1	EU19A	C19A	16.04	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU20A	C20A**	16.04	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	0.23	1.00	0.15	0.67	100	3.86	NO
Plasma Surface Coating Stations subject to NESHAP 6W																	
1245 Main Street	1	EU05B	C05D	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU06B	C06D	8.04	5.42	99.97%	99.99%	5.42	23.75	7.12E-07	—	—	—	—	100	1.93	NO
	1	EU10B	C10D	6.04	5.42	99.97%	99.99%	5.42	23.75	7.12E-07	—	—	—	—	100	1.93	NO
1415 Main Street	1	EU01B	C01B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU02B	C02B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU03B	C03B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU05B	C05B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU07B	C07B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	3.00	13.14	3.00	13.14	100	3.86	NO
			Baffles**	16.64	2.60	84.00%	0.00%	11.25	49.28	9.65							
	1	EU08B	C08B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU09B	C09B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
	1	EU11B	C11B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
High Velocity Oxy Fuel Coating Stations NOT subject to NESHAP 6W																	
1245 Main Street	1	EU04A	Baffles	16.04	6.69	40%	0%	10.85	47.52	8.50	—	—	—	—	100	3.86	NO
Plasma Surface Coating Stations NOT subject to NESHAP 6W																	
1245 Main Street	1	EU20B	Baffles	8.04	4.34	60%	0%	5.42	23.74	4.75	—	—	—	—	100	1.93	NO
1415 Main Street	1	EU12B	C12B	16.64	9.00	99.97%	99.99%	9.00	39.43	1.16E-06	—	—	—	—	100	3.86	NO
1500 Polco Street	1	EU04B	No Control**	1.00	0.00	40%	0.00%	0.60	2.63	—	—	—	—	—	100	0.24	NO
	24							Total PTE (tons/yr):	1174.89	28.74							

Total PM, PM10, and PM2.5 Emissions After Integral Control: 105.86

Total PM Emissions After PSD Limits: 31.04

Total PM10 and PM2.5 Emissions After FESOP Limits: 30.71

NOTES

**The control devices are not integral for these units. Therefore, PTE is considered before controls.

Cubicles EU20A, EU10B, and EU07B have FESOP limits. See Limit Compliance sheet for detailed information.

*The coating materials used are 100% solids, and are comprised of metallic and ceramic compounds. This results in high coating densities.

Appendix A: Emissions Summary
Surface Coating at 1245 Main Street and 1415 Main Street

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

HAP Emissions								Controlled HAPs					Uncontrolled HAPs				
Location	Surface Coater ID	Control Device ID	Titanium Tetrachloride Content (%)	Nickel Content %	Chromium Content (%)	Cobalt Content (%)	Total HAP Content (%)	Controlled Titanium Tetrachloride Emissions (tons/yr)	Controlled Nickel Emissions (tons/yr)	Controlled Chromium Emissions (tons/yr)	Controlled Cobalt Emissions (tons/yr)	Controlled Total HAP Emissions (tons/yr)	Uncontrolled Titanium Tetrachloride Emissions (tons/yr)	Uncontrolled Nickel Emissions (tons/yr)	Uncontrolled Chromium Emissions (tons/yr)	Uncontrolled Cobalt Emissions (tons/yr)	Uncontrolled Total HAP Emissions (tons/yr)
Detonation Surface Coating Stations subject to NESHAP 6W																	
1245 Main Street	EU01A	C01A	0%	50%	75%	0%	95%	0.00	1.43E-05	2.14E-05	0.00	0.00	0.00	47.54	71.31	0.00	90.32
	EU02A	C02A	0%	50%	75%	0%	95%	0.00	1.43E-05	2.14E-05	0.00	0.00	0.00	47.54	71.31	0.00	90.32
	EU16A	C16A	0%	50%	75%	0%	95%	0.00	1.43E-05	2.14E-05	0.00	0.00	0.00	47.54	71.31	0.00	90.32
	EU17A	C17A	0%	50%	75%	0%	95%	0.00	1.43E-05	2.14E-05	0.00	0.00	0.00	47.54	71.31	0.00	90.32
	EU18A	C18A	0%	50%	75%	0%	95%	0.00	1.43E-05	2.14E-05	0.00	0.00	0.00	47.54	71.31	0.00	90.32
	EU05A	C05A	0%	50%	75%	0%	95%	0.00	1.43E-05	2.14E-05	0.00	0.00	0.00	47.54	71.31	0.00	90.32
Low Pressure Plasma Spray Coating Station subject to NESHAP 6W																	
1415 Main Street	EU01S	C01S**	0%	75%	50%	5%	95%	---	---	---	---	---	0.00	0.01	0.01	0.00	0.01
High Velocity Oxy Fuel Coating subject to NESHAP 6W																	
1245 Main Street	EU19A	C19A	0%	0%	0%	20%	20%	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	7.69	7.69
	EU20A	C20A**	0%	50%	75%	0%	95%	0.00	5.91E-07	8.87E-07	0.00	1.12E-06	0.00	19.72	29.57	0.00	37.46
Plasma Surface Coating Stations subject to NESHAP 6W																	
1245 Main Street	EU05B	C05D	0%	0%	20%	75%	79%	0.00	0.00E+00	2.37E-07	0.00	0.00	0.00	0.00	4.75	17.81	18.76
	EU06B	C06D	0%	0%	20%	75%	79%	0.00	0.00	1.42E-07	0.00	0.00	0.00	0.00	4.75	17.81	18.76
	EU10B	C10D	0%	0%	20%	75%	79%	0.00	0.00	1.42E-07	0.00	0.00	0.00	0.00	4.75	17.81	18.76
1415 Main Street	EU01B	C01B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.46
	EU02B	C02B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.46
	EU05B	C05B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.46
	EU06B	C06B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.46
	EU07B	C07B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.46
		Baffles**	0%	0%	0%	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	EU08B	C08B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.45
	EU09B	C09B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.45
	EU11B	C11B	0%	50%	50%	50%	95%	0.00	5.91E-07	5.91E-07	0.00	0.00	0.00	19.72	19.72	19.72	37.46
High Velocity Oxy Fuel Coating Stations NOT subject to NESHAP 6W																	
1245 Main Street	EU04A	Baffles	0%	0%	0%	20%	20%	0.00	0.00	0.00	1.90	1.90	0.00	0.00	0.00	9.50	9.50
Plasma Surface Coating Stations NOT subject to NESHAP 6W																	
1245 Main Street	EU03B	Baffles	0%	0%	6%	20%	20%	0.00	0.00	0.00	0.95	0.95	0.00	0.00	0.00	4.75	4.75
1415 Main Street	EU12B	C12B	0%	0%	6%	0%	0%	0.00	0.00E+00	0.00E+00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1500 Polco Street	EU04B****	No Control	0%	0%	6%	6%	0%	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00
							HAPs Emissions After Integral Control and Before FESOP Limits:	0.00	39.41	49.30	22.57	77.76					
							HAPs Emissions After Integral Control and FESOP Limits:	0.00	0.01	0.01	2.85	2.86					

Methodology:
Maximum Throughput, Amount Collected, and Control Efficiencies are from the source.
Uncontrolled Potential Particulate Emissions (tons/yr) = [Amount Collected (lbs/hr) / Dust Collector Control Efficiency (%)] x (8,760 hrs/year) / (2,000 lbs/ton)
Controlled Potential Particulate Emissions (tons/yr) = Uncontrolled Potential Emissions (tons/yr) x [(1-Dust Collector Control Efficiency (%)) x (1 - HEPA Filter Efficiency (%))]*
*If no HEPA Filter, use [1 - Dust Collector Control Efficiency (%)]

Controlled HAP Emissions (tons/yr) = Controlled Potential Particulate Emissions (tons/yr) x HAP Content (%)
HAP Content is based on worst-case coatings.
All HAPs are from particulate matter.

Spray Type:	Coating:
D-Gun	CRC-104
HVOF	WC-559
1245 Plasma	CO-111
1245 Plasma-EU03B	WC-106
1415 Plasma	CO-159
LPPS	NI-535-2
1500 Plasma*****	YO-118
1500 Plasma*****	151.065 Ta
1500 Plasma*****	ZRO-113

*Note that the coating booths with baffles do not use coatings containing chromium or nickel HAPs per 40 CFR Part 63, Subpart WWWWWW.
**Total HAPs were determined by subtracting the lower range % of the non-HAP materials in the MSDS from 100%.
***The HVOF, D-Gun, and Plasma coating operations involve gas explosions. In the HVOF and and Plasma coaters, hydrogen gas is exploded. In the D-Gun coaters, acetylene is exploded. There are no HAPs or criteria pollutants generated by the exploded gas. Kerosene is used in EU04B and EU19A. Calculations are provided in a separate spreadsheet for kerosene combustion.
****Cubicle EU04B is only operated for production purposes sparingly. A conservative estimate of the max throughput was calculated with a throughput of 216 lbs/month (given by Praxair) and converting to 0.30 lbs/day. Then 0.30lbs/day was multiplied by ~3 to achieve a conservative throughput estimate of 1 lbs/hour. This cubicle is operated without an emission control device. Therefore, the control efficiency is substituted with a transfer efficiency of 40% given by Praxair.
*****There are 3 different coatings used in the EU04B cubicle. Per the SDSs, the plasma coatings used in EU04B contain no HAPs.

Appendix A: Emissions Summary
Kerosene Combustion Only
MM BTU/HR <100

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Location	Equipment Name	gal/month
1415	Kerosene used in EU08B	26
1245	Kerosene used in EU19A	26
	Total Capacity (gal/month)	**52**
	Total Capacity (kgal/month)	**0.052**
	Heating Value (MMBtu/gal)	**0.135**
	Total Capacity (MMBtu/month)	**7.0**

S = Weight % Sulfur
0.5

	Pollutant						
	PM*	**PM10***	**PM2.5**	**SO_2**	**NOx**	**VOC**	**CO**
Emission Factor in lb/kgal	2.0	1.3	1.3	71.0 *(142.0S)*	20.0	0.34	5.0
Potential Emission in tons/yr	6.24E-04	4.06E-04	4.06E-04	2.22E-02	6.24E-03	1.06E-04	1.56E-03

*PM emission factor is filterable PM only. PM10 & PM2.5 emission factors are filterable and condensable fractions combined.

	HAPs - Metals				
	Arsenic	Beryllium	Cadmium	Chromium	Lead
Emission Factor in lb/MMBtu	4.0E-06	3.0E-06	3.0E-06	3.0E-06	9.0E-06
Potential Emission in tons/yr	1.68E-07	1.26E-07	1.26E-07	1.26E-07	3.79E-07

	HAPs - Metals, continued			
	Mercury	Manganese	Nickel	Selenium
Emission Factor in lb/MMBtu	3.0E-06	6.0E-06	3.0E-06	1.5E-05
Potential Emission in tons/yr	1.26E-07	2.53E-07	1.26E-07	6.32E-07

The five highest organic and metal HAPs emission factors are provided above. **Total HAPs:** **2.06E-06**

Appendix A: Emissions Summary
Natural Gas Combustion Only
MM BTU/HR <100

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
34.59	297.09

	Pollutant						
	PM*	PM10*	PM2.5	SO_2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.28	1.13	1.13	0.09	14.85	0.82	12.48

*PM emission factor is filterable PM only. PM10 & PM2.5 emission factors are filterable and condensable fractions combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

	HAPs - Organics					
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene	
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03	
Potential Emission in tons/yr	3.12E-04	1.78E-04	1.11E-02	2.67E-01	5.05E-04	Total HAPs
						0.28

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	7.43E-05	1.63E-04	2.08E-04	5.64E-05	3.12E-04

The five highest organic and metal HAPs emission factors are provided above.

Methodology
All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu
Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04 (AP-42 Supp
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64.
Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.
Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).

Emission Unit ID	Maximum Capacity (MMBtu/hr)
1245 Main Street	
Heaters for the Kolene tank	0.15
	0.15
Kiln for LSR1	0.15
1415 Main Street	
RTU-A2	0.35
RTU-A3	0.35
RTU-F	0.115
RTU-C1	0.25
RTU-E1	0.525
RTU-B2	0.525
RTU-A5	0.525
RTU-A6	0.525
ACPR4-1	0.133
ACPR4-2	0.115
RTU-00	0.587
ACPR1-1	0.117
ACPR1-2	0.117
RTU-B1	0.3
RTU-A-1	0.3
RTU-A7	0.699
RTU-E1	0.18
RTU-D2	0.54
RTU-C1	0.27
1550 Polco Street	
EU001	3
EU002	3
EU003	3
EU004	3
EU005	3
EU006	3
EU007	3
EU008	3
EU009	3
EUP-11	0.3
EUP-11A	0.3

Appendix A: Emissions Summary
Natural Gas Combustion Only
MM BTU/HR <100

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emission Unit ID	Maximum Capacity (MMBtu/hr)
1500 Polco Street Powerhouse	
EU002	8.369
EU003	8.369
EU004	14.645
1550 Polco Street	
B-001	1.26
B-002	0.150
B-003	0.45
B-004	0.45
Total	**33.69**

Heat Input Capacity MMBtu/hr	Potential Throughput MMCF/yr
33.69	289.36

	Pollutant						
	PM*	PM10*	PM2.5	SO_2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.27	1.10	1.10	0.09	14.47	0.80	12.15

*PM emission factor is filterable PM only. PM10 & PM2.5 emission factors are filterable and condensable fractions combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

	HAPs - Organics					
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene	
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03	
Potential Emission in tons/yr	3.04E-04	1.74E-04	1.09E-02	2.60E-01	4.92E-04	**Total HAPs**
						0.27

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	7.23E-05	1.59E-04	2.03E-04	5.50E-05	3.04E-04

The five highest organic and metal HAPs emission factors are provided above.

Methodology
All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu
Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04 (AP-42 Su
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64.
Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.
Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).

Appendix A: Emissions Summary
Natural Gas Combustion Only
This sheet is used only to calculate the PTE of the one (1) new natural gas-fired boiler (B-002)
MM BTU/HR <100

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emission Unit ID	Maximum Capacity (MMBtu/hr)
1550 Polco Street	
B-002	0.150
Total	0.15

Heat Input Capacity
MMBtu/hr

0.15

Potential Throughput
MMCF/yr

1.29

	Pollutant						
	PM*	PM10*	PM2.5	SO_2	NOx	VOC	CO
Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission in tons/yr	0.00	0.00	0.00	0.00	0.06	0.00	0.05

*PM emission factor is filterable PM only. PM10 & PM2.5 emission factors are filterable and condensable fractions combined.
**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

	HAPs - Organics					
	Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene	
Emission Factor in lb/MMcf	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03	
Potential Emission in tons/yr	1.35E-06	7.73E-07	4.83E-05	1.16E-03	2.19E-06	Total HAPs
						0.00

	HAPs - Metals				
	Lead	Cadmium	Chromium	Manganese	Nickel
Emission Factor in lb/MMcf	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03
Potential Emission in tons/yr	3.22E-07	7.09E-07	9.02E-07	2.45E-07	1.35E-06

The five highest organic and metal HAPs emission factors are provided above.

Methodology
All emission factors are based on normal firing.
MMBtu = 1,000,000 Btu
MMCF = 1,000,000 Cubic Feet of Gas
Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu
Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04 (AP-42 Su
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low Nox burner is 0.64.
Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.
Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).

Appendix A: Emissions Summary
Building 1550 Specialty Ingot Manufacturing Process - Material Transfer Point

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Powder Throughput (lb/hr)	PM EF (lb/ton)	PM10/PM2.5 EF (lb/ton)	Uncontrolled PM PTE (tons/yr)	Uncontrolled PM10/PM2.5 PTE (tons/yr)	Control Efficiency (%)	Controlled PM PTE (tons/yr)	Controlled PM10/PM2.5 PTE (tons/yr)
275.00	0.0069	0.0033	0.0042	0.0020	99.90%	4.16E-06	4.16E-03

METHODOLOGY:
Raw material handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) * 1/2,000 (ton/lb) * Emission Factor (lbs/ton) * (8,760 hrs/yr) / (2,000 lbs/ton)
Controlled Emissions (tons/yr) = Uncontrolled Emissions (tons/yr) * (1-Control Efficiency)

Appendix A: Emissions Summary
Building 1550 Specialty Ingot Manufacturing Process - Ingot Machining Lathe

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Location	Process:	Max Throughput Rate*		Particulates				HAPs	
				Emission Factor **		Potential to Emit		Lead Content (%) ***	PTE of Lead (tons/year)
		(lbs/hr)	(tons iron/hr)	PM (lbs/ton)	PM10/PM2.5 (lbs/ton)	PM (tons/yr)	$PM_{10}/PM_{2.5}$ (tons/yr)		
1550 Polco Street	Ingot Machining Lathe	100	0.05	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
	Total					2.19E-01	2.19E-03		1.69E-02

Notes
** Emission factors are from FIRE Volume II, Chapter 14, Grey Stone Iron Foundries - SCC 3-04-003-60 (July, 2001)
*** Lead Emission are based on the lab test conducted by Precision Process Division in Walkerton, Indiana
****In the Building 1550 Crucible Cutting room, the product cut is graphite, not metal. Therefore, there are no HAP emissions.
In the absence of valid PM2.5 Emission Factors, it is assumed that PM2.5 emissions = PM10 emissions.

Methodology
PTE PM/PM-10 (tons/year) = Max. Thorughput Rate (tons/hour) * Emission Factor (lbs/ton) * 8760 hours/year * 1 ton/2000 lbs
PTE Lead (tons/year) = Max. Throughput Rate (tons/hour) * PM Emission Factor (lbs/ton) * 8760 hours/year * 1 ton/2000 lbs * Lead Content (%)

Appendix A: Emissions Summary
Buiolding 1550: Coating Mixing Operation - Sermatech Process

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Mixing Type	Max Throughput (lbs/hr)	Density (lbs/gal)	Max Throughput (gal/hr)	Solid Weight %	Particulate EF (lbs/ton pigment)*	VOC Content (lbs/gal)	VOC Emission Rate	Chromium Compound Content (%)
Water-Based Paint Mixing	60.00	13.77	4.36	35%	20	0.00	2%	6%
Solvent-Based Paint Mixing	24.00	10.01	2.40	35%	20	6.33	2%	0%

Scrubber PM Control Efficiency (%)	Uncontrolled Particulate PTE (tons/yr)	Uncontrolled VOC PTE (tons/yr)	Uncontrolled Chromium PTE (tons/yr)	Controlled Particulate PTE (tons/yr)	Controlled Chromium PTE (tons/yr)	Pounds of VOC per Day
99%	0.92	0.00	0.06	0.01	0.00	—
0%	0.37	1.33	0.00	0.37	0.00	—
Total (tons/yr)	1.29	1.33	0.06	0.38	0.00	7.28

Info from Praxair:
Maximum Throughput was provided by the facility.

METHODOLOGY
The VOC and HAP content are based on the MSDS of the worst-case final product, so it is multiplied times the powder and liquid material throughputs, combined.
The VOC emission rate comes from AP-42, 6.4.1.
The PM emission factors come from AP-42, Table 6.4-1. The PM Emission factor is based on pigment throughput, so it is only multiplied times the solid content.
Two scrubbers are used to control powder from the water-based paint mixing process.
The worst-case water-based paint is Sermatel 962, based on HAP content.
The worst-case solvent-based paint is Sermatel 1140, based on VOC content.

Uncontrolled Particulate PTE (tons/yr) = [Max Throughput (lbs/hr) x Solid Weight % / (2,000 lbs/ton)] x Particulate EF (lbs/ton pigment) x (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled VOC PTE (tons/yr) = Max Throughput (gal/hr) x VOC Content (lbs/gal) x (8,760 hrs/yr) / (2,000 lbs/ton)
Uncontrolled Chromium PTE (tons/yr) = Uncontrolled Particulate PTE (tons/yr) x Chromium Compound Content (%)
Controlled PTE (tons/yr) = Uncontrolled PTE (tons/yr) x [1 - Scrubber PM Control Efficiency (%)]

Appendix A: Emissions Summary
Building 1415: Operation 1, Process 1 (O1P1)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Waste Particulate Collected (lbs/yr)	Hours Operated per Year	Dust Collector Control Efficiency*	PTE Particulate (lbs/hr)	PTE Particulate (tons/yr)	Airflow (acfm)	Controlled PM Emissions (gr/ft3)	Able to Comply with 326 IAC 6.5
39795	7392	99.7%	0.02	0.07	4,000	0.00	YES

Methodology:

"Waste Particulate Collected" and "Hours Operated per Year" were provided by Praxair based on waste and operating records. The waste number excludes large chunks that were cleaned out of the equipment.

PTE Particulate During Cleaning (lbs/hr) = (Waste Particulate Collected (lbs/hr))/ Dust Collector Control Efficiency (%) / Hours Operated per Year x (1-Dust Collector Control Efficiency (%))

PTE Particulate from Dust Collector (tons/yr) = PTE Particulate During Cleaning (lbs/hr) x (8,760 hrs/yr) / (2,000 lbs/ton)

*Dust Collectors are integral control devices.

326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Building 1415 - Operation 2, Process 1 (O2P1)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Unit	Maximum Current (Amp)*	PM Emission Factor (grains/A-hr)	PM Emissions (tons/year)	$PM_{10}/PM_{2.5}$ Emissions (tons/year)**
Q-Salts Tanks (6)	42	0.63	0.02	0.02
Total	**42**		**0.02**	**0.02**

* PM_{10} and $PM_{2.5}$ emissions are assumed to be equal to PM emissions
Assuming there will be 6 "Q-Salts" tanks being electrically charged at 7.0 amps each.

Methodology
Potential Emissions (tons/year) = Maximum Current (Amps) * Emission Factor (gr/A-hr) * (1 lb / 7,000 gr) * (8,760 hours / year) * (1 ton / 2,000 lbs)
[1] AP-42, Table 12.20-4 for Other Metals Electroplating
*Note: There is no specific emission factor for the true metal being used in AP-42, Table 12.20-4. For calculations, the emission factor that was worst case was used. Nickel emission factor was used = 0.63 g/A-hr
[2] Schwartz S, Lorber M. 1999. *Characterizing site-specific source emissions for EPA's risk assessment tool for the metal finishing industry.*
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Building 1415 - Operation 2, Process 2 (O2P2)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Building 1415 - Operation 2, Process 2 (O2P2) Totals							
PM	PM10	PM2.5	VOC	Methanol	Nickle	Chromium	Total HAPs
0.00	0.00	0.00	0.04	0.79	0.00	0.00	0.79

Slurry Masking								
Material	Maximum Usage (lbs/hr)	Density (lbs/gal)	VOC Content (lbs/gal)	Methanol Content (%)	VOC Emissions (tons/yr)	Methanol Emissions (tons/yr)	VOC Emissions (lbs/hr)	Usage Rate (gal/day)
Material 1	<12.0	20.96	0.02	1.50%	0.04	0.79	0.01	13.74

Methodology:
VOC Emissions (tons/yr) = Maximum Usage (lbs/hr) / Density (lbs/gal) x VOC Content (lbs/gal) x (8,760 hrs/yr) / (2,000 lbs/ton)
Single HAP Emissions (tons/yr) = Maximum Usage (lbs/hr) x HAP Content (%) x (8,760 hrs/yr) / (2,000 lbs/ton)
Combined HAP Emissions (tons/yr) = Sum of Single HAP Emissions (tons/yr)

Notes:
-There are no particulate emissions from slurry masking because the transfer efficiency is 100%.

Dry Masking/Buffering											
Material	Maximum Usage (lb/yr)	% Nickel	% Chromium	PM EF (lb/ton)	PM10/PM2.5 EF (lb/ton)	PM Emissions (tons/year)	PM10/PM2.5 Emissions (tons/year)	Nickel Emissions (tons/year)	Chromium Emissions (tons/year)	Material Density (lbs/gal)	Usage Rate (gal/day)
Material 2	20000	50%	5%	0.0069	0.0033	3.45E-05	1.65E-05	1.73E-05	1.73E-06	100	0.55
					Potential Emissions (tons/yr)	**3.45E-05**	**1.65E-05**	**1.73E-05**	**1.73E-06**		
					Combined HAPs (tons/yr)	**1.90E-05**					

Methodology:
*Handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
PM/PM10/PM2.5 Emissions (tons/year) = Throughput (tons/year) * EF (lb/ton) * (1 ton / 2,000 lb)
HAP Emissions (ton/year) = PM Emissions (ton/year) * % HAP
326 IAC 6.5 equivalent limit (lb/hr) = limit in the rule (0.03 gr/dscf) x air flow rate of control device (dscf/min) x 1 lb/7000 gr x 60 mins/hr

Appendix A: Emissions Summary
Building 1550- Epoxy Kits (EUS-12)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Epoxy Kit Filling:

Volume of Container (oz)	Volume of Container (ft3/can)	Container Throughput (cans/hr)	V_{Tair} (ft3/yr)	MEK Batch Amount (g/can)	Density MEK (g/cm3)	MEK Batch Amount (ft3/can)	Volume % MEK	V_{air} (ft3/yr)	T_{fill} (K)	VP_{MEK} (mmHg)	Molecular Weight MEK (g/mol)	K_{MEK}	C_{blend}	VOC Potential Emissions (tons/yr)
10	0.01	120	10978.52	70	0.810	0.003	29%	3208.14	298.15	90.6	72.11	1.09	29%	4.03

Methodology:

Note: The materials for the epoxy kit are added directly to the bottles. The filling is sealed to minimize VOC emissions.There are 6 products manufactured on the epoxy kit line. The worst-case VOC product, UCAR 106 Epoxy/MEK was used in the calculations.

The methodology is from the American Chemical Council "MDI Emissions Reporting Guidelines for the Polyurethane Industry," Section 5-27 Filling/Blending, published May 2012.

MEK chemical properties are from the MSDS.

Volume % MEK = MEK Batch Amount (ft3/can) / Volume of Container (ft3/can)

V_{Tair} (ft3/yr)= Container Throughput (cans/hr) x (8,760 hrs/yr) x Volume of Container (ft3/can)

V_{air} (ft3/yr) = V_{Tair} (ft3/yr) x Volume % MEK

T_{fill} = 298.15 K (ambient temperature)

K_{MEK} = MEK Concentration in Feedstock (100%) x T_{fill} (K) /273.15K

C_{blend} = Volume % MEK

VOC Emissions (tons/yr) = V_{air} x (1 / 359) x [273.15 / T_{fill} (K)] x (VP_{MEK} (mmHg) / 760) x Molecular Weight MEK (g/mol) x K_{MEK} x C_{blend} / (2,000 lbs/ton)

***Vermiculate Pouring:**

Material	Max Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/ PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	Control Efficiency Dust Collector	Control Efficiency HEPA Filters	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)
Vermiculate	50	0.0069	0.0033	7.56E-04	3.61E-04	99.50%	99.999%	3.79E-06	1.81E-06

*Vermiculate is used in the packaging for the epoxy kits. It is controlled by dust collector DC014, which is equipped with HEPA filters.

Methodology:

Maximum throughputs were provided by Praxair.

VOC content and density are from the MSDSs.

Vermiculate pouring PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer.

Uncontrolled VOC PTE (tons/yr) = Max Throughput (gal/hr) x VOC Content (lbs/gal) x VOC Emission Rate x (8,760 hrs/yr) / (2,000 lbs/ton)

Uncontrolled Particulate PTE (tons/yr) = Max Throughput (lbs/hr) / (2,000 lbs/ton) x EF (lbs/ton) x (8,760 hrs/yr) / (2,000 lbs/ton)

Controlled Particulate PTE (tons/yr) = Uncontrolled Particulate PTE (tons/yr) x [1- (Control Eff Dust Collector x Control Eff HEPA Filters)]

Appendix A: Emissions Summary
Pack Diffusion Process (1415 Main Street)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Before/After Control	Pack Diffusion PTE (tons/yr)				
	PM	PM10	PM2.5	HF	Total HAPs
Before Control	1.95	1.95	1.95	0.24	0.24
After Control	1.95	1.95	1.95	0.02	0.02

Material Handling - Pack Station				
Total Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/ PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)
100	0.0069	0.0033	1.51E-03	7.23E-04

Material Handling - Unpack Station				
Total Powder Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/ PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)
100	0.0069	0.0033	1.51E-03	7.23E-04
		Potential Emissions (tons/yr)	**3.02E-03**	**1.45E-03**

METHODOLOGY:
'Handling PM and PM10/2.5 emission factors are from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer
Uncontrolled Emissions (tons/yr) = Powder Throughput (lbs/hr) / (2,000 lbs/ton) * EF (lbs/ton) * (8,760 hours/year) / (2,000 lbs/ton)
There are no HAPs in the dry materials used in the Polishing Department.

Additive Usage						
Usage (lbs/hr)	Molecular Weight of Additive (g/mol)	Molecular Weight HF (g/mol)	Ratio Moles HF to Moles ABF	HF PTE before control(ton/yr)	Scrubber Control Efficiency	HF Emissions After Control (ton/yr)
0.10	37.04	20.01	1.00	0.24	90%	0.02

METHODOLOGY:
Assume that 100% of the HF generated evaporates.
The ratio of moles of HF to moles of additive is based on the reaction. There is one mole HF reacted for every mole of additive.
Uncontrolled PTE (tons/yr) = Usage (lbs/hr) x Molecular Weight HF (g/mol) / Molecular Weight additive (g/mol) x Ratio x (8760 hrs/yr) / (2,000 lbs/ton)

Dry Ice / Air Blasting			
Residual Powder (lb/part)	Maximum Production Rate (parts week)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)
0.5	150	1.95	1.95

METHODOLOGY:
Redidual powder is dislodged from parts using either a dry ice blasting cabinet or an air blasting cabinet.
Uncontrolled PM Emissions (ton/year) = Redidual Powder (lb/part) * Maximum Production Rate (parts/week) * 52 weeks/year * (1 ton / 2,000 lbs)

Appendix A: Emissions Summary
EU020G - Grit Reclassifier Building 1245

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Throughput (lbs/hr)	PM EF (lbs/ton)	PM10/ PM2.5 EF (lbs/ton)	Uncontrolled PM Emissions (tons/yr)	Uncontrolled PM10/PM2.5 Emissions (tons/yr)	Uncontrolled PM Emissions (lbs/hr)	Uncontrolled PM10/PM2.5 Emissions (lbs/hr)	Control Efficiency	Controlled PM Emissions (tons/yr)	Controlled PM10/ PM2.5 Emissions (tons/yr)
400	0.0069	0.0033	0.01	0.003	0.0014	0.0007	99.0%	0.00006	0.00003

METHODOLOGY:
Emission factors for PM and PM10/2.5 from AP 42, Table 11.12-2, Concrete Batching-Aggregate Transfer.
Uncontrolled Emissions (tons/yr) = Throughput (lbs/hr) / (2,000 lbs/ton) * EF (lbs/ton) * (8,760 hours/year) / (2,000 lbs/ton)

Appendix A: Emissions Summary
Grinding and Metal Cutting Operations

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Location	Process:	Number of Units	Maximum Throughput Rate*		Particulates				HAPs	
					Emission Factor **		Potential to Emit		Lead Content (%) ***	PTE of Lead (tons/year)
			(lbs/hr)	(tons iron/hr)	PM (lbs/ton)	PM10/PM2.5 (lbs/ton)	PM (tons/yr)	$PM_{10}/PM_{2.5}$ (tons/yr)		
1245 Main Street	Building 1245 Maintenance Shop	1	100	0.05000	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
	Fifteen (15) Building 1245 Various Grinders	15	100	0.05000	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
	Brown and Sharp Grinder	1	3.00	0.00150	0.01	0.0045	6.57E-03	6.57E-05	7.70%	5.06E-04
1415 Main Street	Maintenance Shop #1	1	100	0.05000	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
	Maintenance Shop #2	1	100	0.05000	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
1500 Polco Street	Building 1500 Machine Shop	1	100	0.05	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
	Building 1500 Fabrication Shop	1	50	0.025	0.01	0.0045	1.10E-01	1.10E-03	7.70%	8.43E-03
	Maintenance Welding Shop	1	5	0.0025	0.01	0.0045	1.10E-02	1.10E-04	7.70%	8.43E-04
1550 Polco Street	1550 Mainenance Shop	1	100	0.05	0.01	0.0045	2.19E-01	2.19E-03	7.70%	1.69E-02
	Specialty Powders Crucible Cutting (CC019)****	1	5	0.0025	0.01	0.0045	1.10E-02	1.10E-04	7.70%	8.43E-04
Facility-Wide	Downdraft Tables	Various	2000	1	0.01	0.0045	4.38E-02	1.97E-02	7.70%	3.4E-03
				Total (tons/yr):			1.60	0.03		0.12

Notes
*The maximum metal throughput is based on 3 grinders grinding a maximum of 5 lbs/day and 1 metal saw cutting a maximum of 1 lb/day, with a work shift of 6 hours per day.
** Emission factors are from FIRE Volume II, Chapter 14, Grey Stone Iron Foundries - SCC 3-04-003-60 (July, 2001)
*** Lead Emission are based on the lab test conducted by Precision Process Division in Walkerton, Indiana
****In the Building 1550 Crucible Cutting room, the product cut is graphite, not metal. Therefore, there are no HAP emissions.
In the absence of valid PM2.5 Emission Factors, it is assumed that PM2.5 emissions = PM10 emissions.
The four (4) vented tables used for insignificant grinding are assumed to have negligible PM, PM10, and PM2.5 emissions.

Methodology
PTE PM/PM-10 (tons/year) = Max. Thorughput Rate (tons/hour) * Emission Factor (lbs/ton) * 8760 hours/year * 1 ton/2000 lbs
PTE Lead (tons/year) = Max. Throughput Rate (tons/hour) * PM Emission Factor (lbs/ton) * 8760 hours/year * 1 ton/2000 lbs * Lead Content (%)

Appendix A: Emissions Summary
Welding and Thermal Cutting

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

PROCESS WELDING	Number of Stations	Max. electrode consumption per station (lbs/hr)		EMISSION FACTORS* (lb pollutant/lb electrode)				EMISSIONS (lbs/hr)				HAPS (lbs/hr)
				PM = PM10	Mn	Ni	Cr	PM = PM10	Mn	Ni	Cr	
Metal Inert Gas (MIG)(carbon steel)	3	3		0.0055	0.0005			0.050	0.005	0.000	0	0.005
Tungsten Inert Gas (TIG)(carbon steel	0			0.0055	0.0005			0.000	0.000	0.000	0	0.000
Arc	6	2.4		0.0211	0.0009			0.304	0.013	0.000	0	0.013
FLAME CUTTING	Number of Stations	Max. Metal Thickness Cut (in.)	Max. Metal Cutting Rate (in./minute)	EMISSION FACTORS (lb pollutant/1,000 inches cut, 1" thick)**				EMISSIONS (lbs/hr)				HAPS (lbs/hr)
				PM = PM10	Mn	Ni	Cr	PM = PM10	Mn	Ni	Cr	
Plasma**	1	0.5	300	0.0039				0.035	0.000	0.000	0.000	0.000
EMISSION TOTALS												
Potential Emissions lbs/hr								0.39	0.02	0.00	0.00	0.02
Potential Emissions lbs/day								9.32	0.42	0.00	0.00	0.42
Potential Emissions tons/year	10							1.70	0.08	0.00	0.00	0.08

Notes
Welding and plasma cutting stations are part of the metal grinding and cutting operations.

Methodology:
*Emission Factors are default values for carbon steel unless a specific electrode type is noted in the Process column.
**Emission Factor for plasma cutting from American Welding Society (AWS). Trials reported for wet cutting of 8 mm thick mild steel with 3.5 m/min cutting speed (at 0.2 g/min emitted). Therefore, the emission
Using AWS average values: (0.25 g/min)/(3.6 m/min) x (0.0022 lb/g)/(39.37 in./m) x (1,000 in.) = 0.0039 lb/1,000 in. cut, 8 mm thick
Plasma cutting emissions, lb/hr: (# of stations)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 8 mm thick)
Cutting emissions, lb/hr: (# of stations)(max. metal thickness, in.)(max. cutting rate, in./min.)(60 min./hr.)(emission factor, lb. pollutant/1,000 in. cut, 1" thick)
Welding emissions, lb/hr: (# of stations)(max. lbs of electrode used/hr/station)(emission factor, lb. pollutant/lb. of electrode used)
Emissions, lbs/day = emissions, lbs/hr x 24 hrs/day
Emissions, tons/yr = emissions, lb/hr x 8,760 hrs/year x 1 ton/2,000 lbs.

Appendix A: Emissions Summary
Carpentry Shop (1500 Polco Street)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Emission Unit ID	Maximum Througput (lb/hr)	PM Emission Factor lb/ton	PM10 Emission Factor (lb/ton)	PM2.5 Emission Factor (lb/ton)	Control Efficiency (%) **	Uncontrolled Potential to Emit PM (tons/yr)	Uncontrolled Potential to Emit PM10 (tons/yr)	Uncontrolled Potential to Emit PM2.5 (tons/yr)	Controlled Potential to Emit PM (tons/yr)	Controlled Potential to Emit PM10 (tons/yr)	Controlled Potential to Emit PM2.5 (tons/yr)
Band Saw	50	3.50E-01	2.00E-01	2.00E-01	0%	3.83E-02	1.53E-04	8.76E-05	3.83E-02	1.53E-04	8.76E-05
Drill Press	50	3.50E-01	2.00E-01	2.00E-01	0%	3.83E-02	1.53E-04	8.76E-05	3.83E-02	1.53E-04	8.76E-05
Belt Sander	50	3.50E-01	2.00E-01	2.00E-01	0%	3.83E-02	1.53E-04	8.76E-05	3.83E-02	1.53E-04	8.76E-05
Circular Saw	50	3.50E-01	2.00E-01	2.00E-01	90%	3.83E-02	1.53E-04	8.76E-05	3.83E-03	1.53E-05	8.76E-06
Table Saw	50	3.50E-01	2.00E-01	2.00E-01	90%	3.83E-02	1.53E-04	8.76E-05	3.83E-03	1.53E-05	8.76E-06
						1.92E-01	**7.67E-04**	**4.38E-04**	**1.23E-01**	**4.91E-04**	**2.80E-04**

Emission factors based off of FIRE Version 5.0 August 1995 SCC 3-07-00802 (Log Sawing)

Methodology:
Uncontrolled Potential to Emit (PM/PM10/PM2.5) tons/yr = Maximum Throughput (lb/hr) / Emission Factor (lb/ton) * 8760 hrs/1 year
Controlled Potential to Emit (PM/PM10/PM2.5) tons/yr = Uncontrolled Potential to Emit (PM/PM10/PM2.5) tons/yr * (1-Control Efficiency (%))

Appendix A: Emissions Summary
Reciprocating Internal Combustion Engines - Diesel Fuel
Output Rating (<=600 HP)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Generator	Location	hp
Generac Generator	Building 1500	207.0
ONAN/Cummins Generator	Powerhouse	168.0
	Total	375.0

Emissions calculated based on output rating (hp)

Output Horsepower Rating (hp)	375.0
Maximum Hours Operated per Year	500
Potential Throughput (hp-hr/yr)	187,500

	Pollutant						
	PM*	PM10*	direct PM2.5*	SO2	NOx	VOC	CO
Emission Factor in lb/hp-hr	0.0022	0.0022	0.0022	0.0021	0.0310	0.0025	0.0067
Potential Emission in tons/yr	0.21	0.21	0.21	0.19	2.91	0.24	0.63

*PM and PM2.5 emission factors are assumed to be equivalent to PM10 emission factors. No information was given regarding which method was used to determine the factor or the fraction of PM10 which is condensable.

**NOx emission factor: uncontrolled = 0.024 lb/hp-hr, controlled by ignition timing retard = 0.013 lb/hp-hr

Hazardous Air Pollutants (HAPs)

	Pollutant							
	Benzene	Toluene	Xylene	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein	Total PAH HAPs***
Emission Factor in lb/hp-hr****	6.53E-06	2.86E-06	2.00E-06	2.74E-07	8.26E-06	5.37E-06	6.48E-07	1.18E-06
Potential Emission in tons/yr	6.12E-04	2.68E-04	1.87E-04	2.57E-05	7.74E-04	5.03E-04	6.07E-05	1.10E-04

***PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)

****Emission factors in lb/hp-hr were calculated using emission factors in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).

Potential Emission of Total HAPs (tons/yr)	0.0025

Methodology

Emission Factors are from AP42 (Supplement B 10/96), Tables 3.3-1 and 3.3-2
CH4 and N2O Emission Factor from 40 CFR 98 Subpart C Table C-2.
Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.
Potential Throughput (hp-hr/yr) = [Output Horsepower Rating (hp)] * [Maximum Hours Operated per Year]
Potential Emission (tons/yr) = [Potential Throughput (hp-hr/yr)] * [Emission Factor (lb/hp-hr)] / [2,000 lb/ton]
Potential NOx Emissions = (1,273,280 hp-hr/yr) * (0.0310 lb/hp-hr) / (2,000 lbs/ton) = 19.74 tons/yr
CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission

Appendix A: Emissions Summary
Tribonet Lines 1 and 2 (Building 1415)

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Tank ID	Materials	Amount in Tank	Units	Amount Added per Month	Units	Total Added per Year (lbs/yr)	Density (lbs/gal)	Estimated Evaporation Rate	Total Emissions (lbs/yr)	VOC Content	HCl Content (%)	Nickel Compound Content (%)	Cobalt Compound Content (%)	Chromium Compound Content (%)	Uncontrolled PTE VOC (tons/yr)	Uncontrolled PTE HCl (tons/yr)	Uncontrolled PTE Nickel Compounds (tons/yr)	Uncontrolled PTE Cobalt Compounds (tons/yr)	Uncontrolled PTE Chromium Compounds (tons/yr)
104	HCl	[illegible]	gal	10	gal	1951.67	5.93	[illegible]	[illegible]	0%	[illegible]	0%	0%	0%	0.05	[illegible]	[illegible]	[illegible]	[illegible]
	Nickel Chloride	202	gal	40	lbs	480.00	11.15	[illegible]	96.00	0%	0%	[illegible]	0%	0%	0.00	[illegible]	[illegible]	[illegible]	[illegible]
204	HCl	10	gal	10	gal	1951.67	5.93	[illegible]	[illegible]	0%	[illegible]	0%	0%	0%	0.05	[illegible]	[illegible]	[illegible]	[illegible]
	Nickel Chloride	209	gal	40	lbs	480.00	11.15	[illegible]	96.00	0%	0%	[illegible]	0%	0%	0.05	[illegible]	[illegible]	[illegible]	[illegible]
105	T104CS Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
106	T104CS Powder	67.2	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	763.6	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	[illegible]	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
110	T104LS Powder	116	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
111	T104CS Powder	116	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
112	T104CS Powder	116	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
115	T104CS Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
205	T104CS Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
211	T104CS Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
213	T104LS Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
214	T104CS Powder	116	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
215	T104CS Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
119	Nickel Sulfamate (50%)***	105.3	gal	40	lbs	480.00	13.15	[illegible]	96.00	0%	0%	[illegible]	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Nickel Chloride	7.7	gal	40	lbs	480.00	11.15	[illegible]	96.00	0%	0%	[illegible]	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	124.4	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	CBN Powder	16.6	lbs	40	lbs	480.00	29.21	[illegible]	96.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
117	Nickel Sulfamate (50%)***	[illegible]	gal	40	lbs	480.00	13.15	[illegible]	96.00	0%	0%	[illegible]	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Nickel Chloride	4.7	gal	40	lbs	480.00	11.15	[illegible]	96.00	0%	0%	[illegible]	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	CBN Powder	6.5	lbs	40	lbs	480.00	29.21	[illegible]	96.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
210	T104T Powder	110	lbs	40	lbs	480.00	*	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] Powder	116	lbs	40	lbs	480.00	[illegible]	[illegible]	96.00	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Cobalt Sulphate	1259	lbs	40	lbs	480.00	16.27	[illegible]	96.00	0%	0%	0%	100%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Boric Acid	75	lbs	10	lbs	120.00	12.62	[illegible]	24.00	0%	0%	0%	0%	0%	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
														Total Uncontrolled PTE (tons/yr)	0.00	0.09	0.17	0.62	0.49
														Control Efficiency	99.50%	99.50%	99.50%	99.50%	99.50%
														Total Controlled PTE (tons/yr)	0.00	0.0005	0.0008	0.0031	0.0025

Methodology:

*Density was not provided in the MSDS

**Tanks are changed out once every 2 years

***Nickel Sulfamate is [illegible]

The Tribonet [illegible]

Total Amount Added Per Year (lbs/yr):

For amounts given in lbs:

For amounts given in gal:

Total Amount (lbs/yr) = Amount Added per Month (lbs/month) x (12 months/yr)

Total Amount (lbs/yr) = Amount Added per Month (gallons/month) x Density (lbs/gal) x (12 months/yr)

Total Emissions = Amount Added per Year (lbs/yr) x Evaporation Rate (%)

Evaporation rate of 20% [illegible]
product [illegible]

Appendix A: Emissions Summary
VOC and Particulate
Building 1500 - Scale Coating

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Material	Density (Lb/Gal)	Weight % Organics	Volume % Non-Volatiles (solids)	% Cr Compounds	% Ni	% Co	Gal of Mat. (gal/unit)	Maximum (unit/week)	Gal of Mar. (gal/day)
ST570A (Part 1)	10.8	0.00%	28%	8%	0%	0%	0.01321	10	0.02
ST570A (Part 2)	7.9	94.66%	0%	0%	0%	0%	0.01321	10	0.02
ST1740	16.7	0.00%	80%	24%	18%	18%	0.02642	10	0.04

	Potential VOC (ton/yr)	Particulate Potential (ton/yr)	Potential Cr Compounds (ton/yr)	Potential Ni (ton/yr)	Potential Co (ton/year)	Transfer Efficiency
	0.00E+00	5.01E-05	1.43E-05	0.00E+00	0.00E+00	75%
	2.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	75%
	0.00E+00	4.41E-04	1.29E-04	9.64E-05	9.64E-05	75%
Potential Emissions (tons/yr):	**2.58E-02**	**4.41E-04**	**1.29E-04**	**9.64E-05**	**9.64E-05**	
Combined HAPs (tons/yr):	**3.22E-04**					

Methodology

Potential VOC Tons per Year = Pounds of VOC per Gallon coating (lb/gal) * Gal of Material (gal/unit) * Maximum (units/wk) * (52 wk/yr) * (1 ton/2000 lbs)

PM10 emissions is assumed equal to PM

PM/PM10/HAP Tons per Year = (units/wk) * (gal/unit) * (lbs/gal) * (1- Weight % Volatiles) * (1-Transfer efficiency) *(52 wk/yr) *(1 ton/2000 lbs)

Appendix A: Emissions Summary
Building 1245 - Physical Vapor Deposition Coating Station (EU01T)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Surface Coater ID	Control Device ID	Surface Coating Type	Max Throughput (lbs/hr)	Amount of Dust Cleaned (lbs/week)	% Dust in Coater Emitted during Cleaning	PTE Particulate during Cleaning (tons/yr)	Density of Coating^ (lbs/gal)	Gallons of Coating Per Day (gal/day)	Applicable
EU01T	N/A	PVD	0.25	0.25	5%	0.0003	100	0.06	NO

There are no HAPs in the titanium pucks.

Methodology:

PTE Particulate During Cleaning (tons/yr) = Amount of Dust Cleaned (lbs/week) x (% Dust in Coater Emitted During Cleaning) x (52 weeks/year) / (2000 lbs/ton)

^The coating materials used are 100% solids, and are comprised of metallic and ceramic compounds. This results in high coating densities.

Appendix A: Emissions Summary
Building 1245 - LSR1 Titanium Tetrachloride Coating Station (EU01R)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

HAPs									
Surface Coater ID	**Control Device ID**	**Surface Coating Type**	**Max Throughput (lbs/hr)**	**Molecular Weight TiCl4 (g/mol)**	**Molecular Weight HCl (g/mol)**	**Mol HCl/ Mol TiCl4**	**Uncontrolled PTE HCl (tons/yr)**	**Scrubber Control Efficiency**	**Controlled PTE HCl (tons/yr)**
EU01R	Scrubber	CVD	0.27	189.679	36.46094	4	0.91	90%	0.09

6.5 Applicability		
Density of Coating^ (lbs/gal)	**Gallons of Coating Per Day (gal/day)**	**Applicable**
100	0.06	NO

Methodology:

HAPs are emitted from the conversion of TiCl4 to HCl. In this reaction, there are 4 moles of HCl per mole of TiCl4.

Uncontrolled PTE HCl (tons/yr) = Max Throughput (lbs/hr) x Molecular Weight HCl (g/mol) / Molecular Weight TiCl4 (g/mol) x (Mol HCl/Mol TiCl4) x (8,760 hrs/yr) / (2,000 lbs/hr)

Controlled PTE HCl (tons/yr) = Uncontrolled PTE HCl x (1 - Scrubber Control Efficiency)

^The coating materials used are 100% solids, and are comprised of metallic and ceramic compounds. This results in high coating densities.

Appendix A: Emissions Summary
Building 1415 - Operation 1, Process 3 (O1P3)

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Tank Contents	Usage (lbs/week)	Molecular Weight ABF (g/mol)	Molecular Weight HF (g/mol)	Ratio Moles HF to Moles ABF	HF Emissions (ton/yr)
Ammonium Bifluoride (ABF)	55.00	57.04	20.01	1	0.50

Operation 1 Process 3 includes a dip tank containing a mixture of compounds. There are no VOC compounds or HAP compounds added to the tank. However, ammonium bifluoride in the tank reacts when in contact with water to generate HF and ammonium fluoride (NH4F). Further decomposition of NH4F takes place at temperatures of 100 degree C and above, however, the O1P3 process operates at less than 100 degree C. Therefore, one mole of ABF reacts to form one mole of HF.

Usage (lbs/week) is based on the amount added to the dip tank.

Assume that 100% of the HF generated evaporates.

The ratio of moles of HF to moles of ABF is based on the reaction. The reaction of ABF generates HF and Ammonium Fluoride. There is one mole HF reacted for every mole of ABF.

Uncontrolled PTE (tons/yr) = Usage (lbs/week) x Molecular Weight HF (g/mol) / Molecular Weight ABF (g/mol) x Ratio x (52 weeks/yr) / (2,000 lbs/ton)

Appendix A: Emissions Summary
Building 1415 - Operation 2, Process 4

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

HAPs							
Material	**Control Device ID**	**Max Throughput (lbs/hr)**	**(MW HF/MW Material) x (Mol HF/Mol Material)**	**Percent Reacted**	**Uncontrolled PTE HF (tons/yr)**	**Scrubber Control Efficiency**	**Controlled PTE HF (tons/yr)**
Material 1	Wet Scrubber	<1	0.71	50%	1.57	90%	0.16

Methodology:

The maximum hourly usage is from Praxair.

HAPs are emitted from the material conversion to HF.

Uncontrolled PTE HF (tons/yr) = Max Throughput (lbs/hr) x Molecular Weight HF (g/mol) / Molecular Weight Material (g/mol) x (Mol HF/Mol Material) x (Percent Reacted) x (8,760 hrs/yr) / (2,000 lbs/hr)

Controlled PTE HF (tons/yr) = Uncontrolled PTE HF x (1 - Scrubber Control Efficiency)

Appendix A: Emissions Summary
Building 1550- IPA Room

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Material	Max Throughput (lbs/hr)	Density (lbs/gal)	Max Throughput (gal/hr)	VOC Content (lbs/gal)	VOC Emission Rate	Uncontrolled VOC PTE (tons/yr)
IPA	0.67	6.57	0.10	6.57	100%	2.92

Explanation of Process:

IPA is mixed with powder for milling in the Powder 7 processing area (EUS-22). The IPA is then evaporated out by ovens. The powder handling is already accounted for in the 1550 Powders calculations.

Methodology:

Maximum usage is based on 16 gallons used in 24 hours of operation.

The density and VOC content are from the MSDS.

The VOC emission rate comes from AP-42, 6.4.1.

Uncontrolled VOC PTE (tons/yr) = Max Throughput (gal/hr) x VOC Content (lbs/gal) x VOC Emission Rate x (8,760 hrs/yr) / (2,000 lbs/ton)

Appendix A: Emissions Summary
Stripping and Cleaning Operations

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Building	Stripping Line	Tank	Material	Tank Capacity (gal)	Turnovers/Year	Amount Used per Year (gal)	Density (lbs/gal)	VOC Content (%)	HF Content (%)	HCl Content (%)	VOC Emissions (tons/yr)	HF Emissions (tons/yr)	HCl Emissions (tons/yr)	Combined HAP Emissions (tons/yr)
1415	Hydrochloric Acid Stripping Line	1	Hydrochloric Acid	30	2	60	9.60	0%	0%	38%	0.00	0.00	0.11	0.11
		2	Hydrochloric Acid	30	2	60	9.93	0%	0%	38%	0.00	0.00	0.11	0.11
		3	Hydrochloric Acid	30	0.5	15	9.93	0%	0%	38%	0.00	0.00	0.03	0.03
1245	Crest Cleaning Line	1	T-4181	28	2	56	10.35	10%	0%	0%	0.03	0.00	0.00	0.00
									Total PTE (tons/yr):		0.03	0.00	0.25	0.25

Note: Calculations are not included for the stripping operations where there are no VOCs or HAPs. The following are stripping tanks at Praxair that do not emit VOCs or HAPs.

Building 1415- Hydrochloric Acid Stripping- Two (2) water rinse tanks and one (1) caustic tank

Building 1415- Nitric Acid Stripping - One (1) nitric acid tank and one (1) water rinse tank

Building 1245- Electrolytic Stripping Line - One (1) electrolytical stripping tank (NaOH, tartaric acid, water, and soda ash), one (1) nitric acid tank, one (1) immersion fluid tank, and one (1) Kolene tank

Building 1245- Titanium Nitrate Cleaning Operation- One (1) phosphoric acid cleaning tank

METHODOLOGY:

Tank capacities and turnovers per year were provided by Praxair.

The densities are the densities for pure hydrofluoric acid and hydrochloric acid, as a worst-case scenario.

Emissions (tons/yr)= Tank Capacity (gal) x Turnovers per Year x Density (lbs/gal) x Content (%)

Hydrochloric Acid Stripping Line Prior to Modification														
Building	Stripping Line	Tank	Material	Tank Capacity (gal)	Turnovers/Year	Amount Used per Year (gal)	Density (lbs/gal)	VOC Content (%)	HF Content (%)	HCl Content (%)	VOC Emissions (tons/yr)	HF Emissions (tons/yr)	HCl Emissions (tons/yr)	Combined HAP Emissions (tons/yr)
1415	Hydrochloric Acid Stripping Line	1	Hydrofluoric Acid	30	2	60	9.60	0%	4%	0%	0.00	0.01	0.00	0.01
		2	Hydrochloric Acid	30	2	60	9.93	0%	0%	38%	0.00	0.00	0.11	0.11
		3	Hydrochloric Acid	30	0.5	15	9.93	0%	0%	38%	0.00	0.00	0.03	0.03
									Total PTE (tons/yr):		0.00	0.01	0.14	0.15

Appendix A: Emissions Summary
Miscellaneous Lubricant Usage

Company Name: **Linde Advanced Material Technologies, Inc.**
Source Address: **1245 and 1415 Main Street, Indianapolis, IN 46224**
1500 and 1550 Polco Street, Indianapolis, IN 46222

Building	Lubricant	Maximum Usage (gal/yr)	Density (lbs/gal)	VOC Content (lbs/gal)	Ethylene Glycol Content (%)	Toluene Content (%)	Antimony Compound Content (%)	Lead Compound Content (%)
1415	DP Lubricant Blue	55	6.84	6.78	15%	0%	0%	0%
1245	Molydag	10	11.18	5.14	0%	30%	30%	10%

	VOC Emissions (tons/yr)	Ethylene Glycol Emissions (tons/yr)	Toluene Emissions (tons/yr)	Antimony Compound Emissions (tons/yr)	Lead Compound Emissions (tons/yr)	Combined HAP Emissions (tons/yr)
	0.19	0.03	0.00	0.00	0.00	0.03
	0.03	0.00	0.02	0.02	0.01	0.04
Total PTE (tons/yr):	**0.21**	**0.03**	**0.02**	**0.02**	**0.01**	**0.07**

DP Lubricant Blue is a lubricant used in the polishing process in a quality assurance lab. It is applied to polishing wheels by hand, and is used at a maximum annual rate of 55 gallons per year.

Molydag is a production material that is applied to some customer parts at Building 1245. The maximum annual usage is 10 gallons.

Methodology:

VOC Emissions (tons/yr) = Maximum Usage (gal/hr) x VOC Content (lbs/gal) x (8,760 hrs/yr) / (2,000 lbs/ton)

HAP Emissions (tons/yr) = Maximum Usage (gal/hr) x Density (lbs/gal) x HAP Content (%) x (8,760 hrs/yr) / (2,000 lbs/ton)

Appendix A: Emissions Summary
Fugitive Dust Emissions - Paved Roads

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Paved Roads at Industrial Site

The following calculations determine the amount of emissions created by paved roads, based on 8,760 hours of use and AP-42, Ch 13.2.1 (1/2011).
Vehicle information provided by source.

Building	Type	Maximum number of vehicles per day	Number of one-way trips per day per vehicle	Maximum trips per day (trip/day)	Maximum Weight Loaded (tons/trip)	Total Weight driven per day (ton/day)	Maximum one-way distance (feet/trip)	Maximum one-way distance (mi/trip)	Maximum one-way miles (miles/day)	Maximum one-way miles (miles/yr)
1500	Semi Trucks (entering facility) (one-way trip)	1	1	1.0	43	43.0	650	0.123	0.1	44.9
1500	Semi Trucks (leaving facility) (one-way trip)	1	1	1.0	43	43.0	650	0.123	0.1	44.9
1500	Box Trucks (entering facility) (one-way trip)	1	1	1.0	17.5	17.5	650	0.123	0.1	44.9
1500	Box Trucks (leaving facility) (one-way trip)	1	1	1.0	17.5	17.5	650	0.123	0.1	44.9
1500	Delivery Vans (entering facility) (one-way trip)	2	1	2.0	12.5	25.0	650	0.123	0.2	89.9
1500	Delivery Vans (leaving facility) (one-way trip)	2	1	2.0	12.5	25.0	650	0.123	0.2	89.9
1245	Semi Trucks (entering facility) (one-way trip)	4	1	4.0	30	120.0	1250	0.237	0.9	345.6
1245	Semi Trucks (leaving facility) (one-way trip)	4	1	4.0	30	120.0	1250	0.237	0.9	345.6
1245	Box Trucks (entering facility) (one-way trip)	4	1	4.0	12	48.0	1250	0.237	0.9	345.6
1245	Box Trucks (leaving facility) (one-way trip)	4	1	4.0	12	48.0	1250	0.237	0.9	345.6
1415	Semi Trucks (entering facility) (one-way trip)	8	1	8.0	30	240.0	250	0.047	0.4	138.3
1415	Semi Trucks (leaving facility) (one-way trip)	8	1	8.0	30	240.0	250	0.047	0.4	138.3
1415	Box Trucks (entering facility) (one-way trip)	4	1	4.0	12	48.0	250	0.047	0.2	69.1
1415	Box Trucks (leaving facility) (one-way trip)	4	1	4.0	12	48.0	250	0.047	0.2	69.1
1415	Semi Trucks (entering facility) (one-way trip)	6	1	6.0	40	240.0	1200	0.227	1.4	497.7
1415	Semi Trucks (leaving facility) (one-way trip)	6	1	6.0	40	240.0	1200	0.227	1.4	497.7
1415	Box Trucks (entering facility) (one-way trip)	7	1	7.0	5.5	38.5	1200	0.227	1.6	580.7
1415	Box Trucks (leaving facility) (one-way trip)	7	1	7.0	5.5	38.5	1200	0.227	1.6	580.7
1550	Semi Trucks (entering facility) (one-way trip)	10	1	10.0	44	440.0	400	0.076	0.8	276.5
1550	Semi Trucks (leaving facility) (one-way trip)	10	1	10.0	44	440.0	400	0.076	0.8	276.5
1550	Straight Trucks (entering facility) (one-way trip)	3	1	3.0	15	45.0	400	0.076	0.2	83.0
1550	Straight Trucks (leaving facility) (one-way trip)	3	1	3.0	15	45.0	400	0.076	0.2	83.0
1550	Delivery Trucks (entering facility) (one-way trip)	1	1	1.0	5	5.0	400	0.076	0.1	27.7
1550	Delivery Trucks (leaving facility) (one-way trip)	1	1	1.0	5	5.0	400	0.076	0.1	27.7
1550	Box Trucks (entering facility) (one-way trip)	1	1	1.0	6	6.0	400	0.076	0.1	27.7
1550	Box Trucks (leaving facility) (one-way trip)	1	1	1.0	6	6.0	400	0.076	0.1	27.7
1555	Delivery Vans (entering facility) (one-way trip)	6	1	6.0	5	30.0	1100	0.208	1.3	455.3
1555	Delivery Vans (leaving facility) (one-way trip)	6	1	6.0	5	30.0	1100	0.208	1.3	455.3
1555	Semi Trucks (entering facility) (one-way trip)	3	1	3.0	20	60.0	1100	0.208	0.6	228.1
1555	Semi Trucks (leaving facility) (one-way trip)	3	1	3.0	20	60.0	1100	0.208	0.6	228.1
1555	Parcel Trucks (entering facility) (one-way trip)	3	1	3.0	10	30.0	1100	0.208	0.6	228.1
1555	Parcel Trucks (leaving facility) (one-way trip)	3	1	3.0	10	30.0	1100	0.208	0.6	228.1
1555	Semi Trailers (entering facility) (one-way trip)	3.0	1.0	3.0	40.0	120.0	1100	0.208	0.6	228.1
1555	Semi Trailers (leaving facility) (one-way trip)	3.0	1.0	3.0	40.0	120.0	1100	0.208	0.6	228.1
			Totals	**134.0**		**3110.0**			**20.3**	**7424.4**

Average Vehicle Weight Per Trip = 23.2 tons/trip
Average Miles Per Trip = 0.15 miles/trip

Unmitigated Emission Factor, Ef = $[k * (sL)^{0.91} * (W)^{1.02}]$ (Equation 1 from AP-42 13.2.1)

	PM	PM10	PM2.5	
where k =	0.011	0.0022	0.00054	lb/VMT = particle size multiplier (AP-42 Table 13.2.1-1)
W =	23.2	23.2	23.2	tons = average vehicle weight (provided by source)
sL =	9.7	9.7	9.7	g/m^2 = silt loading value for paved roads at iron and steel production facilities - Table 13.2.1-3)

Taking natural mitigation due to precipitation into consideration, Mitigated Emission Factor, Eext = E * [1 - (p/4N)] (Equation 2 from AP-42 13.2.1)
Mitigated Emission Factor, Eext = Ef * [1 - (p/4N)]
where p = 125 days of rain greater than or equal to 0.01 inches (see Fig. 13.2.1-2)
N = 365 days per year

	PM	PM10	PM2.5	
Unmitigated Emission Factor, Ef =	2.145	0.429	0.105	lb/mile
Mitigated Emission Factor, Eext =	1.965	0.393	0.096	lb/mile
Dust Control Efficiency =	0%	0%	0%	[illegible]

Appendix A: Emissions Summary
Fugitive Dust Emissions - Paved Roads

Company Name: Linde Advanced Material Technologies, Inc.
Source Address: 1245 and 1415 Main Street, Indianapolis, IN 46224
1500 and 1550 Polco Street, Indianapolis, IN 46222

Building	Type	Unmitigated PTE of PM (tons/yr)	Unmitigated PTE of PM10 (tons/yr)	Unmitigated PTE of PM2.5 (tons/yr)	Mitigated PTE of PM (tons/yr)	Mitigated PTE of PM10 (tons/yr)	Mitigated PTE of PM2.5 (tons/yr)	Controlled PTE of PM (tons/yr)	Controlled PTE of PM10 (tons/yr)	Controlled PTE of PM2.5 (tons/yr)
1500	Semi Trucks (entering facility) (one-way trip)	0.05	0.01	0.00	0.04	0.01	0.00	0.04	0.01	0.00
1500	Semi Trucks (leaving facility) (one-way trip)	0.05	0.01	0.00	0.04	0.01	0.00	0.04	0.01	0.00
1500	Box Trucks (entering facility) (one-way trip)	0.05	0.01	0.00	0.04	0.01	0.00	0.04	0.01	0.00
1500	Box Trucks (leaving facility) (one-way trip)	0.05	0.01	0.00	0.04	0.01	0.00	0.04	0.01	0.00
1500	Delivery Vans (entering facility) (one-way trip)	0.10	0.02	0.00	0.09	0.02	0.00	0.09	0.02	0.00
1500	Delivery Vans (leaving facility) (one-way trip)	0.10	0.02	0.00	0.09	0.02	0.00	0.09	0.02	0.00
1245	Semi Trucks (entering facility) (one-way trip)	0.37	0.07	0.02	0.34	0.07	0.02	0.34	0.07	0.02
1245	Semi Trucks (leaving facility) (one-way trip)	0.37	0.07	0.02	0.34	0.07	0.02	0.34	0.07	0.02
1245	Box Trucks (entering facility) (one-way trip)	0.37	0.07	0.02	0.34	0.07	0.02	0.34	0.07	0.02
1245	Box Trucks (leaving facility) (one-way trip)	0.37	0.07	0.02	0.34	0.07	0.02	0.34	0.07	0.02
1415	Semi Trucks (entering facility) (one-way trip)	0.15	0.03	0.01	0.14	0.03	0.01	0.14	0.03	0.01
1415	Semi Trucks (leaving facility) (one-way trip)	0.15	0.03	0.01	0.14	0.03	0.01	0.14	0.03	0.01
1415	Box Trucks (entering facility) (one-way trip)	0.07	0.01	0.00	0.07	0.01	0.00	0.07	0.01	0.00
1415	Box Trucks (leaving facility) (one-way trip)	0.07	0.01	0.00	0.07	0.01	0.00	0.07	0.01	0.00
1415	Semi Trucks (entering facility) (one-way trip)	0.52	0.11	0.03	0.49	0.10	0.02	0.49	0.10	0.02
1415	Semi Trucks (leaving facility) (one-way trip)	0.52	0.11	0.03	0.49	0.10	0.02	0.49	0.10	0.02
1415	Box Trucks (entering facility) (one-way trip)	0.62	0.12	0.03	0.57	0.11	0.03	0.57	0.11	0.03
1415	Box Trucks (leaving facility) (one-way trip)	0.62	0.12	0.03	0.57	0.11	0.03	0.57	0.11	0.03
1550	Semi Trucks (entering facility) (one-way trip)	0.30	0.06	0.01	0.27	0.05	0.01	0.27	0.05	0.01
1550	Semi Trucks (leaving facility) (one-way trip)	0.30	0.06	0.01	0.27	0.05	0.01	0.27	0.05	0.01
1550	Straight Trucks (entering facility) (one-way trip)	0.09	0.02	0.00	0.08	0.02	0.00	0.08	0.02	0.00
1550	Straight Trucks (leaving facility) (one-way trip)	0.09	0.02	0.00	0.08	0.02	0.00	0.08	0.02	0.00
1550	Delivery Trucks (entering facility) (one-way trip)	0.03	0.01	0.00	0.03	0.01	0.00	0.03	0.01	0.00
1550	Delivery Trucks (leaving facility) (one-way trip)	0.03	0.01	0.00	0.03	0.01	0.00	0.03	0.01	0.00
1550	Box Trucks (entering facility) (one-way trip)	0.03	0.01	0.00	0.03	0.01	0.00	0.03	0.01	0.00
1550	Box Trucks (leaving facility) (one-way trip)	0.03	0.01	0.00	0.03	0.01	0.00	0.03	0.01	0.00
1555	Delivery Vans (entering facility) (one-way trip)	0.49	0.10	0.02	0.45	0.09	0.02	0.45	0.09	0.02
1555	Delivery Vans (leaving facility) (one-way trip)	0.49	0.10	0.02	0.45	0.09	0.02	0.45	0.09	0.02
1555	Semi Trucks (entering facility) (one-way trip)	0.25	0.05	0.01	0.22	0.04	0.01	0.22	0.04	0.01
1555	Semi Trucks (leaving facility) (one-way trip)	0.25	0.05	0.01	0.22	0.04	0.01	0.22	0.04	0.01
1555	Parcel Trucks (entering facility) (one-way trip)	0.25	0.05	0.01	0.22	0.04	0.01	0.22	0.04	0.01
1555	Parcel Trucks (leaving facility) (one-way trip)	0.25	0.05	0.01	0.22	0.04	0.01	0.22	0.04	0.01
1555	Semi Trailers (entering facility) (one-way trip)	0.25	0.05	0.01	0.22	0.04	0.01	0.22	0.04	0.01
1555	Semi Trailers (leaving facility) (one-way trip)	0.25	0.05	0.01	0.22	0.04	0.01	0.22	0.04	0.01
	Totals	**7.58**	**1.60**	**0.39**	**7.20**	**1.46**	**0.36**	**7.20**	**1.46**	**0.36**

Methodology

Total Weight driven per day (ton/day) = [Maximum Weight Loaded (tons/trip)] * [Maximum trips per day (trip/day)]
Maximum one-way distance (mi/trip) = [Maximum one-way distance (feet/trip)] / [5280 ft/mile]
Maximum one-way miles (miles/day) = [Maximum trips per year (trip/day)] * [Maximum one-way distance (mi/trip)]
Average Vehicle Weight Per Trip (ton/trip) = SUM[Total Weight driven per day (ton/day)] / SUM[Maximum trips per day (trip/day)]
Average Miles Per Trip (miles/trip) = SUM[Maximum one-way miles (miles/day)] / SUM[Maximum trips per year (trip/day)]
Unmitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Unmitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
Mitigated PTE (tons/yr) = [Maximum one-way miles (miles/yr)] * [Mitigated Emission Factor (lb/mile)] * (ton/2000 lbs)
Controlled PTE (tons/yr) = [Mitigated PTE (tons/yr)] * [1 - Dust Control Efficiency]

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1 LBS PAK 1 OF 1

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