

PERMIT BOOK

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 122013-006

Project Number: 2012-05-036
Installation Number: 510-0066

Parent Company: Elementis Specialties, Inc.

Parent Company Address: 329 Wyckoffs Mill Road, Highstown, NJ 08520-9720

Installation Name: Elementis Specialties, Inc.

Installation Address: 5548 Manchester Avenue, St. Louis, MO 63110

Location Information: St. Louis City, Land Grant 2037

Application for Authority to Construct was made for:

The increase in production through operational changes and the installation of a spare impact mill. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

DEC 17 2013

EFFECTIVE DATE

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Elementis Specialties, Inc.
St. Louis City

1. **Superseding Condition**
The conditions of this permit supersede all of the special conditions found in the previously issued construction permit no. 012007-018 issued by the Air Pollution Control Program.
2. **Control Equipment – Baghouse**
 - A. Elementis Specialties, Inc. shall control emissions from the following emission points using baghouses as specified in the permit application.

Table 1: Emission Points Controlled by Baghouses

Emission Point (Emission Unit)	Control Device Number	Description
EP1 (EU0120)	CD-1	Clay Storage Silos
EP66 (EU0410)	CD-66	PUG Mill Day Silo
EP69 (EU0440)	CD-68	PUG Mill Bag Dump Station

- B. The baghouses shall be operated and maintained in accordance with the manufacturer's specifications. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - C. Visible emissions will be used as an indicator of the proper operation of the control device. During proper operation no visible emissions are expected from this emission unit. The existence of visible emissions will indicate a decrease in the efficiency of the control device and corrective actions shall be implemented. Observations will be made using a USEPA Method 22 trained observer and USEPA Method 22 like procedures.
 - 1) Frequency: Visible emissions from the exhaust shall be monitored on a daily basis when the process is in operation.
 - 2) Duration: The duration of the observation shall be for a 2 minute time period.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- 3) Threshold: The condition of no visible emissions is considered normal for this emission unit. When visible emissions are noted from the emission unit, it shall be documented and corrective actions taken.
 - 4) The observation of visible emissions from this emission unit will be considered an excursion and corrective actions shall be implemented within a reasonable period.
 - 5) If the level of excursions exceed three percent of the total number of observations in a six month period, then Elementis Specialties, Inc. shall contact the Air Pollution Control Program and perform source testing within 90 days of the last excursion to ensure that the control efficiency of the baghouse is at least 99.0%. If the testing shows a control efficiency less than 99.0%, then Elementis Specialties, Inc. shall apply for a new permit to take into account the new control efficiency.
- D. Elementis Specialties, Inc. shall maintain an operating and maintenance record for the baghouses (e.g. the Malfunction/Breakdown Reporting form) which shall include the following:
- 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
2. Control Equipment – Baghouse/Thermal Oxidizer
- A. Elementis Specialties, Inc. shall control emissions from the PUG mill baghouse receiver (EP68) using a baghouse (CD-67) followed by a thermal oxidizer (S-64) as specified in the permit application.
 - B. The baghouse and thermal oxidizer shall be operated and maintained in accordance with the manufacturer's specifications. Replacement filters for the baghouses shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - C. Elementis Specialties, Inc. shall install pressure gauges or meters on the baghouse that indicate the pressure drop across the control device. Elementis Specialties, Inc. shall then monitor and record the operating pressure drop across the baghouse at least once every 24 hours. The pressure drop shall be maintained within the design conditions specified

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

by the manufacturer's performance warranty or determined by the facility to provide for acceptable operating conditions. If the pressure drop determined by the facility to provide for acceptable operating conditions is different than the numbers provided by the manufacturer's performance warranty, Elementis Specialties, Inc. shall contact the Enforcement Unit of the Air Pollution Control Program for approval of these numbers.

- D. The operating temperature of the thermal oxidizer shall be continuously monitored and recorded during operations. The operating temperature of the thermal oxidizer shall be maintained within a range of the average temperature of the oxidizer. Both the range and the average operating temperature will be determined using the most recent compliance test required by Special Condition III of Construction Permit No. 05-09-008 issued by the City of St. Louis Department of Health.
 - E. Elementis Specialties, Inc. shall maintain an operating and maintenance record for the baghouse and thermal oxidizer (e.g. the Malfunction/Breakdown Reporting form) which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.
3. Record Keeping and Reporting Requirements
- A. Elementis Specialties, Inc. shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. Elementis Specialties, Inc. shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2012-05-036
Installation ID Number: 510-0066
Permit Number:

Elementis Specialties, Inc.
5548 Manchester Avenue
St. Louis, MO 63110

Complete: May 7, 2012

Parent Company:
Elementis Specialties, Inc.
329 Wyckoffs Mill Road
Highstown, NJ 08520-9720

REVIEW SUMMARY

- Elementis Specialties, Inc. has applied for authority to increase its production level through operational modifications and the installation of a spare impact mill.
- HAP emissions are expected from this project, but only in amounts less than their respective Screening Model Action Levels (SMAL). The HAPs of concern are methyl chloride and benzyl chloride.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- Baghouses and a thermal oxidizer are being used to control the emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in St. Louis City, a nonattainment area for the PM_{2.5} and ozone standards and an attainment area for all other criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. However, because the facility is in a nonattainment area for the PM_{2.5} and ozone standards, the installation's PM_{2.5}, NO_x, and VOC major source level is 100 tpy. The installation's major source level for all other criteria pollutants is 250 tons per year and fugitive emissions are not

counted toward major source applicability.

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required as a condition in this permit. However, the facility is required to perform stack test on the thermal oxidizer every five (5) years as required in Construction Permit No. 05-09-008 issued by the St. Louis City Health Department.
- A Part 70 Operating Permit modification application is required for this installation within one (1) year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Elementis Specialties, Inc. owns and operates a rheological additives manufacturing plant in St. Louis, MO. Two types of clay and five (5) types of amines are used as raw materials. The main product at the plant is Bentone Organoclay. This installation is currently a major source under both construction and operating permits. A Part 70 Operating Permit (OP2011-058) was issued to the facility in 2011. The following construction permits have been issued to the installation from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
98-07-048	Plant rebagging station
05-09-008	Raw material change
012007-018	PUG mill production
07-08-014	Packing System
09-06-014	Pneumatic transfer system.

PROJECT DESCRIPTION

The facility was issued Construction Permit No. 012007-018 in 2007 for the installation of a PUG mill production process. At that time, the process was expected to produce a maximum of 8,000 metric tons (8,818.5 short tons) per year of organoclay products. For this project, the facility proposes to add a spare impact mill that, along with improvements in mill operations, will be able to increase the maximum production rate to 10,500 metric tons per year (11,574 short tons).

The spare impact mill will be used only when the main impact mill is down for maintenance or repair. The process is also bottlenecked by the PUG mill that feeds both of the impact mills so that the process will not be able to produce more than 10,500 metric tons (11,574 short tons) per year of organoclay even if the facility decides to operate both mills at the same time. Particulate emissions from the pug mill production process are controlled using baghouses. The VOC and HAPs emissions from the use of the amines, which are added from the amine storage tanks to the PUG mill, are controlled by a thermal oxidizer.

The facility also made some changes in the nomenclature and emission points from Construction Permit No. 012007-018, which required all of the special conditions in Permit No. 012007-018 to be restated in this permit using the new nomenclature and emission points. All of the special conditions in Permit No. 012007-018 are superseded.

- EU0410 (EP66) is now labeled the PUG mill day silo instead of the PUG mill feed hopper.
- EU0430 (EP68) is now labeled the PUG mill baghouse receiver instead of the packer station feed hopper.
- EU0440 (EP69) is now the PUG mill bag dump station instead of the bag dump station.
- Emissions from the clay transfer vessel, which was originally designed to emit separately through its own emission point (EP65), will be transferred directly to the PUG mill day silo and emitted at emission point EP66.
- The PUG mill, which was designed to emit through emission point EP67, will instead emit through the same stack as the PUG mill baghouse receiver (EP68). EP67 is therefore eliminated.

EMISSIONS/CONTROLS EVALUATION

Emissions from this project, with the exception of HAP emissions, were calculated using the potential emissions of the PUG mill process after the project minus the baseline actual emissions (BAE) from the PUG mill process. Because HAPs are not regulated NSR pollutants, BAE were not subtracted from the potential emissions for the project emissions calculations. Potential particulate emissions from the clay storage and handling (EU0120, EU0410) are calculated using an emission factor from a mass balance test performed at the installation in 1994. The mass balance only tested for PM, so PM_{2.5} and PM₁₀ were calculated using the particle size distribution given in EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Appendix B.2., Table B.2.2., Category 4.

The product flows from the PUG mill to the impact mill and then to the PUG mill baghouse receiver. There is no direct discharge through the vent on the PUG mill or from the impact mill. All of the emissions from these equipment are ducted to the baghouse on the PUG mill baghouse receiver (EU0430), which is also connected to a thermal oxidizer. Emissions from the mills and the baghouse receiver were calculated using an emission factor in the EPA Factor Information Retrieval (FIRE) software, Standard Classification Code (scc) 30101402. FIRE only had emission factors for PM and PM₁₀. PM_{2.5} emissions were calculated by multiplying the emission factor by the percentage of PM_{2.5} in PM given in EPA document AP-42, Appendix B.2., Table B.2.2., Category 4. All of the baghouses were given the control efficiency of 99% and the thermal oxidizer was given 50% control of PM_{2.5}, PM₁₀ and PM. The 99% baghouse device control efficiency is the default used by the Air Pollution Control Program and the 50% thermal oxidizer efficiency is the lowest efficiency given in the EPA Air Pollution Control Technology factsheet. A 100% baghouse capture efficiency was used for the clay storage silos (EU0120), the PUG mill day silo (EU410) and the PUG mill baghouse receiver (EU0430), because the emission points are completely enclosed. A 50% capture efficiency was used for the PUG mill bag dump station (EU0440) because it is not a totally enclosed emission point and 50% is considered conservative. Furthermore, the use of any capture efficiency (i.e. any number between 0% and 100%) for this emission point will not change the type of permit required for this facility.

VOC and HAPs emissions are expected from the use of the liquid amines. Emissions were calculated assuming 100% of the VOC and HAPs are emitted. The percent VOC and HAPs were obtained from the MSDS for the amines. The thermal oxidizer was given 95% control of VOC and HAPs, which is the default used by the Air Pollution Control Program. The BAE were calculated using the production data from 2010 and 2011 using the same method outlined for the potential emissions calculations. Table 2 below lists the numbers used in the PTE minus BAE calculations.

Table 2: Project Emissions Calculations (tpy)

Pollutants	New PTE	2010 BAE	2011 BAE	2 Year BAE	PTE-BAE
PM _{2.5}	0.97	0.19	0.46	0.32	0.65
PM ₁₀	2.69	0.60	1.51	1.06	1.63
PM	3.75	0.71	1.78	1.24	2.51
VOC	36.97	7.63	7.34	7.49	29.48
HAP	0.09	N/A	N/A	N/A	0.09

The following table provides an emissions summary for this project. Existing potential emissions were not determined. However, according to information taken from previous permits, this installation is a major source for PM₁₀ and VOC under construction permits. Existing actual emissions were taken from the installation's 2011 EIQ. Potential emissions of the application represent the potential of the new and modified equipment assuming continuous operation (8760 hours per year).

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM	25.0	N/D	N/D	2.51	N/A
PM ₁₀	15.0	N/D	13.73	1.63	N/A
PM _{2.5}	10.0	N/D	0.31	0.65	N/A
SO _x	40.0	N/D	0.02	N/A	N/A
NO _x	40.0	N/D	4.83	N/A	N/A
VOC	40.0	N/D	68.02	29.48	N/A
CO	100.0	N/D	4.06	N/A	N/A
HAPs	10.0/25.0	N/D	N/D	0.09	N/A
Benzyl Chloride	0.1	N/A	N/D	0.01	N/A
Methyl Chloride	10.0	N/A	N/D	0.08	N/A

N/A = Not Applicable; N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Elementis Specialties, Inc. shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Chia-Wei Young
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated May 4, 2012, received May 7, 2012, designating Elementis Specialties, Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

- U.S. EPA Factor Information Retrieval System (FIRE).

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	tph	tons per hour
hr	hour	tpy	tons per year
hp	horsepower	VMT	vehicle miles traveled
lb	pound	VOC	Volatile Organic Compound
lbs/hr	pounds per hour		
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Jeff Rehm
Manager, Process Engineering
Elementis Specialties, Inc.
5548 Manchester Avenue
St. Louis, MO 63110

RE: New Source Review Permit - Project Number: 2012-05-036

Dear Mr. Rehm:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you have any questions regarding this permit, please do not hesitate to contact Chia-Wei Young, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:cyl

Enclosures

c: St. Louis Regional Office
PAMS File: 2012-05-036

Permit Number: