

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: 012007 - 018 Project Number: 2006-10-012

Parent Company: Elementis Specialties, Inc.

Parent Company Address: P.O. Box 700, 329 Wyckoffs Mill Road,  
Hightstown, NJ 08520

Installation Name: Elementis Specialties, Inc.

Installation Address: 5548 Manchester, St. Louis 63110

Location Information: St. Louis City

Application for Authority to Construct was made for:  
Addition of a pug mill production process. 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.

JAN 29 2007

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James Kavanagh".  
\_\_\_\_\_  
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 this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located with 15 days after the actual start up of this (these) air contaminant source(s).

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 source(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.

**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. Control Equipment – Baghouse

- A. Elementis Specialties, Inc. shall control emissions using baghouses as specified in the permit application from the following emission points:

Emission Point	Description
EP65	Clay Transfer Vessel
EP66	PUG Mill Feed Hopper
EP67	PUG Mill Vent
EP68	Packer Station Feed Hopper
EP69	Bag Dump Station

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).

- B. 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 will 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.
  - 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. An excursion does not necessarily indicate a violation of the applicable requirement.

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Project No.	2006-10-012

**SPECIAL CONDITIONS:**

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

When the level of excursions exceed three percent of the of the total number of observations in a six month period and corrective actions fail to return the emission unit to a no visible emission condition, then the permittee shall conduct source testing within 90 days of the last excursion to demonstrate compliance with 10 CSR 10-6.400. If the test demonstrates noncompliance with the above emission limitation the permittee shall propose a schedule to implement further corrective actions to bring the source into compliance and demonstrate that compliance.

- C. 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 - Thermal Oxidizer
  - A. The thermal oxidizer must be in use at all times when the PUG Mill Vent (EP67) is in operation or any time that regulated PM<sub>10</sub> or volatile organic compounds (VOC) emissions are possible. The thermal oxidizer shall be operated and maintained in accordance with the manufacturer's specifications.
  
  - B. The operating temperature of the thermal oxidizer shall be continuously monitored and recorded during operation. 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. The most recent sixty (60) months of records shall be maintained on-site and shall be made immediately available to Missouri Department of Natural Resources' or City of St. Louis APCP's personnel upon request.
  
  - C. Elementis Specialties, Inc. shall maintain an operating and maintenance record for the 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.

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

Project Number: 2006-10-012  
Installation ID Number: 510-0066  
Permit Number: 012007 - 018

Elementis Specialties, Inc.  
5548 Manchester  
St. Louis 63110

Complete: October 2, 2006  
Reviewed: December 21, 2006

Parent Company:  
Elementis Specialties, Inc.  
P.O. Box 700  
329 Wyckoffs Mill Road  
Hightstown, NJ 08520

St. Louis City

REVIEW SUMMARY

- Elementis Specialties, Inc. has applied for authority to construct a pug mill production process.
- Hazardous Air Pollutant (HAP) emissions are not expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Baghouses are being used to control PM<sub>10</sub> 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 criteria pollutants are below de minimis levels.
- This installation is located in St. Louis City, a nonattainment area for ozone (O<sub>3</sub>) and an attainment area for all other criteria air pollutants.
- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].

- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels.
- Emissions testing is not required for the equipment.
- Revision to the Part 70 Operating Permit application is required for this installation within 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, Missouri. Two types of clay and five types of amines are used as the raw materials. The main product at the plant is Bentone Organoclay. This installation is currently a major source under both construction and operating permits. The following permits have been issued to Elementis Specialties, Inc. from the Air Pollution Control Program.

Table 1: Permits issued

Permit Number	Description
OP2001-107	Part 70 Operating Permit
98-07-048	Plant rebagging station
05-09-008	Raw material change

### PROJECT DESCRIPTION

Elementis Specialties, Inc. proposes to construct a new pug mill production process. Bentonite Clay from the existing clay storage silos, along with Minu Gel Clay from Bag Dump Station, will be transferred to the pug mill feed hopper via a Transfer Vessel (EP65) to the PUG Mill Feed Hopper (EP66). From the Feed Hopper the Bentonite Clay or Minu GelClay will be blended and reacted (EP67) with a tallow-based, quaternary amine to form the finished product, which will be transferred to an impact mill for particle size reduction and then to the Packer Station Feed Hopper (EP68). The existing Bag Dump Station (EP61) is currently used in the Bentone Rebagging System. However, it will be moved from the Rebagging System to the new Bag Dump Station for the PUG Mill System (EP69). Two new 7,250-gallon tanks will store the quaternary amine used in the PUG Mill System.

Table 2: Summary of new emission points

Emission Point	Description	MHDR	Control Device
EP65	Clay Transfer Vessel	0.69 tons	Baghouse
EP66	PUG Mill Feed Hopper	0.69 tons	Baghouse
EP67	PUG Mill Vent	22 ton	Baghouse, Thermal Oxidizer
EP68	Packer Station Feed Hopper	1 ton	Baghouse
EP69*	Bag Dump Station*	1.5 ton	Baghouse
EP70	Amine Storage Tanks	(2) 7,250 gallons, capacity	N/A

\*Bag Dump Station will be moved from EP61 to EP69.

## EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis were taken from previous permits for similar processes in the plant and use the mass balance approach. All particulate emissions from the new equipment (except the tanks) will be controlled using baghouses. In addition, clay vented from the Loss-in-Weight Feed Hopper will be vented to the PUG Mill Feed Hopper baghouse and emitted through the same stack. The PM<sub>10</sub> and VOC emissions expected from the PUG Mill Vent stream will be vented to a baghouse to remove PM<sub>10</sub> emissions and then vented to a thermal oxidizer for VOC control. Prior testing of the thermal oxidizer was performed as required by St. Louis City Permit Number SR02.028 and operational requirements listed under Special Condition 2 should refer to those test results.

The tanks will be maintained at a constant 140 degrees Fahrenheit in order to keep the raw material molten for pumping. Therefore, emissions of VOC are expected from the amine storage tanks only through working loss and not breathing loss.

Existing potential emissions were not determined. However, based on information taken from previous permits, this installation is a major source under construction permits. Existing actual emissions were taken from the 2005 Emissions Inventory Questionnaire (EIQ). Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year). The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2005 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM <sub>10</sub>	15.0	N/D	11.94	6.89	N/A
SO <sub>x</sub>	40.0	N/D	0.01	N/A	N/A
NO <sub>x</sub>	40.0	N/D	2.16	N/A	N/A
VOC	40.0	N/D	47.69	6.66	N/A
CO	100.0	N/D	1.81	N/A	N/A
HAPs	10.0/25.0	N/D	N/D	N/A	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 criteria 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*  
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.
- *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*
- *Control of Odors in the Ambient Air, 10 CSR 10-5.160*
- *Control of Emissions From Volatile Organic Liquid Storage, 10 CSR 10-5.500*

### SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes, 10 CSR 10-6.400*

### 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.

  
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Emily E. Wilbur  
Environmental Engineer

1-25-07  
\_\_\_\_\_  
Date

## PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 4, 2006, received August 4, 2006, 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.