

TECHNICAL SUPPORT DOCUMENT (TSD)

PERMIT #1683

I. GENERAL COMMENTS:

A. Company Information

1. Sasol Chemicals (USA), LLC.
2. Physical Address: 7800 S. Kolb Road, Tucson, AZ 85706
Mailing Address: (Same as physical address)

B. Background

Sasol Chemicals (USA), LLC. (Sasol), has incurred no violations or actions against it since the issuance of the last permit.

The plant has undergone various process changes since the issuance of their last permit on April 17, 2006 and permit revision dated July 31, 2009, particularly the removal of the hydrochloric recovery system. Sasol has also removed the rotary kilns and their baghouses and all of the previously permitted generators. Additional equipment removed from the permit include:

The 24" jet mill and jet mill baghouse, Equipment IDs JM-500 and BH-500. These were removed because the emissions are vented into the building not vented to the outside.
The Cooling Tower was removed; equipment ID TW-400.
The Kewanee Boiler was removed; equipment ID BO-407.

Sasol has installed the following emission emitting equipment:

A new natural gas non-emergency generator, equipment ID EN-630 subject to 40 CFR 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

A Netzsch jet mill and baghouse, equipment IDs JM-670 & BH 670.

A Tunnel Kiln #4; equipment ID FU-630.

PDEQ has removed the exhaust fans from the equipment list and have determined that in addition to the Large Spray Dryer the Pendulum Kiln and the Shuttle Kilns, by definition, are subject to 40 CFR 60 Subpart UUU - Standards of Performance for Calciners and Dryers in Mineral Industries.

C. Attainment Classification

The plant is in an area that is in attainment for all pollutants.

II. SOURCE DESCRIPTION

The Sasol plant produces both high purity alumina products for the use in synthetic crystal growth, ceramics for semi-conductor processing, bio ceramics, ceramics for translucent lighting components, fluorescent lamp coatings, phosphors, luminescent materials and other specialty applications. Sasol uses milling techniques and thermal treatment (calcination) to achieve desired product properties.

A. Process Description

The Sasol plant produces high purity aluminum oxide starting from commodity grade hydrated aluminum oxide by first milling the material to smaller particle size and then thermally decompose the precipitated product as high purity aluminum oxide. The type of processes undertaken include the use of: kilns for high temperature production of materials, a blending silo and a mill for grinding product material to smaller sizes. The main pollutants emitted are: PM, SO₂, NO_x, and CO.

B. Air Pollution Control Equipment

The air pollution control equipment at the site consists of baghouses.

The baghouses are part of the operational design of facility and perform dual functions within the site processes, to collect the product material and remove particulate matter from the exhaust drying gasses. The estimated emissions are based on the design airflow rates, material balance and baghouse effectiveness. The effectiveness of the baghouses is assumed to be 99%.

III. REGULATORY HISTORY

A. Testing & Inspections

Sasol was found in compliance after the last full compliance evaluation of Sasol, conducted on 02/28/12. Sasol is currently in substantial compliance with Pima County Code Title 17.

B. Excess Emissions

There was one report of an excess emission since issuance of the last permit in 2009.

IV. EMISSIONS ESTIMATES

The calculation of SO_x, CO, NO_x, and VOC emissions are based on AP-42 Emission Factors, test results and the specific fuel consumption characteristics of the facility equipment.

When calculating annual emission in tons per year (tpy), the potential to emit (PTE) for the Pendulum Kiln was considered as two emission sources; a point source from the stack of the associated baghouse and a fugitive source at the exit end of the Pendulum Kiln as the alumina powder that has been processed through the pendulum kiln is dropped into a chute. PDEQ chose to use a conservative AP 42 emission factor representative of a typical drop or transfer point provided for similar material (cement supplement and lime material handling).

The following emission rates are for reference purposes only and are not intended to be enforced by direct measurement unless otherwise noted in the Specific Conditions of the air quality permit #1683.

Pollutant	Controlled Emissions (Tons/Yr)
Nitrogen Oxides (NO _x)	15.37
Carbon Monoxide (CO)	15.38
Volatile Organic Compounds (VOC)	0.90
Particulate Matter (PM)	15.6
Sulfur Oxides (SO _x)	2.57
Hazardous Air Pollutants (HAPs)	0.57

The plant is an area source for Hazardous Air Pollutants.

V. APPLICABLE REQUIREMENTS

A. New Source Performance Standards (NSPS):

40 CFR Part 60 Subpart UUU - Standards of Performance for Calciners and Dryers in Mineral Industries.

- 60.732(a) - Standards for Particulate Matter.
- 60.734 - Monitoring of Emissions and Operations:

Source is exempt from monitoring requirements of this part when the potential to emit from each calciner and dryer is less than 11 tons/yr. **[Reference attachment: EPA Applicability Determination Detail, Control Number 9600060]**

60.736(a) and (b)(1) - Test Methods and Procedures

40 CFR Part 60 Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

B. State Implementation Plan (SIP) - The following SIP rules apply:

- Rule 316.A Particulate Materials.
- Rule 318.A and C Vacant Lots and Open Spaces.
- Rule 321 Emissions-Discharge Opacity Limiting Standards.
- Rule 332 Compilation of Mass Rates and Concentrations
- Rule 343 Visibility Limiting Standard.
- Rule 344.A Odor Limiting Standards.

C. Pima County Code (PCC) - The following PCC rules apply:

- 17.16.010 Local rules and standards.
- 17.16.030 Odor limiting standards.
- 17.16.040 Standards and applicability (includes NESHAP.)
- 17.16.050 Visibility limiting standard.
- 17.16.100 Particulate materials.
- 17.16.165 Standards of performance for fossil-fuel fired industrial and commercial equipment
- 17.16.430 Standards of performance for unclassified sources.

VI. PERMIT CONTENTS

A. Emission Limits/ Standards:

NSPS Equipment

40 CFR 60.732(a) & (b) 17.12.350 Control Number 9600060, 17.12.350	Particulate Matter Standard NSPS Applicability Determination Detail
17.12.190.B	Voluntary accepted emission limitations and standards
40 CFR 60.11(c), 17.12.350	Opacity Standard
40 CFR 60.11(d)	Good air pollution control practice for minimizing emissions

Non NSPS Equipment 17.16.430.A & B.	Standards of performance for unclassified sources
17.16.430.B, 17.16.130.F.1, F.2 & SIP Rule 316.A, 17.12.350	Particulate matter determination
SIP Rule 321.A, 17.16.030, 17.16. 130.B.3	Opacity Limitation
Fossil Fuel Fired Equipment SIP Rule 332, 17.16.165.C.1, 17.16.165.D	Particulate Matter Standard
General Standards for the Facility 17.16.100.A, SIP Rule 318.A, SIP Rule 318.C	Particulate Matter Standard
SIP Rule 321.A.1, 17.16.040.A 17.16.130.B.3, 17.16.050.B & 17.16.010.B	Opacity Standard
17.16.050.D, D.2 & D.3 SIP Rule 344.A, 17.16.030	Visibility Limiting Standard Odor Limiting Standard

B. Monitoring Requirements:

NSPS Equipment 17.12.180.A.3	Particulate Matter/Opacity Monitoring
17.12.030	Sampling, testing and analysis requirements
40 CFR 60.8 and 40 CFR 60.736, 17.12.050	Performance Test
Non NSPS Equipment 17.12.180.A.3	Particulate Matter/Opacity Monitoring
Fossil Fuel Fired Equipment 17.12.180.A.3	Operation and maintenance requirements
General Standards for the Facility 17.16.050	Particulate Matter
17.12.180.A.3	Odor control

C. Recordkeeping Requirements:

NSPS Equipment 17.12.180.A.4	Record observations according to operation and maintenance plan
Non NSPS Equipment 17.12.180.A.4	Recording of opacity observations
17.12.180.A.4	Record observations according to operation and maintenance plan
General Standards 17.12.180.A.4	Particulate Matter/Opacity recordkeeping

D. Reporting Requirements:

NSPS Equipment 17.12.180.A.5	Reporting observations according to operation and maintenance plan
40 CFR 60.8 & 17.12.050	Report results of performance tests Non NSPS Equipment
17.12.180.A.5	Reporting requirements according to general standards
Fossil Fuel fired Equipment 17.12.180.A.5	Reporting requirements according to general standards
General Standards 17.12.180.A.5	Operation and maintenance plan submittal
17.12.180.A.5.a	Excess emissions and permit deviation reporting.
17.12.180.A.5.a	Semiannual summary reports of required monitoring
17.12.320	Emissions inventory reporting
17.12.240	Operational change

E. Testing Requirements:

NSPS Equipment 17.20.070	EPA Test Method 5 Test to monitor particulate matter
17.20.010	Particulate Matter testing upon request by the Control Officer
General Standards 17.12.180.A.3	Permit contents - monitoring
17.20.010	Test procedures/ methods
17.20.010	Performance testing according to operation and maintenance plan
17.20.010	Particulate Matter testing upon request by the Control Officer
17.20.010	EPA Test Method 9 Test to monitor opacity
17.20.010	Performance test once per permit term or upon request by the Control Officer
17.20.010	Odor testing if requested by Control Officer

F. Alternate Operating Scenarios:

The applicant has not requested any alternate operating scenarios.

G. Miscellaneous Comments:

The first permit application for this facility was submitted in May 1995.

July 2004: Minor permit revision undertaken to accommodate catalyst production in the Tunnel Kiln.

August 2004: Minor permit revision undertaken to accommodate installation of Nutec-Bickley Rotary Kiln and associated Baghouse.

August 2004: Source submitted application for 5-year permit.

November 2006: Significant Permit Revision for replacement of the Pendulum Kiln (FU-201).

VII. IMPACTS TO AMBIENT AIR QUALITY

None required, as the source is not major.

VIII. CONTROL TECHNOLOGY DETERMINATION

No control technologies needed to be determined. This facility is in an area of attainment and is not a new source.