



## 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: **11 2007 - 001** Project Number: 2006-10-013

Parent Company: Federal Mogul Corporation

Parent Company Address: 3700 Forest Park Av. St. Louis, MO 63108

Installation Name: Federal Mogul Corporation, Chassis Products

Installation Address: 3700 Forest Park Avenue, St. Louis, MO 63108

Location Information: City of St. Louis

Application for Authority to Construct was made for:  
Switch cold box catalyst from Dimethylamine (DMA) to Triethylamine (TEA). This review was conducted in accordance with Section (5) for Volatile Organic Compounds (VOCs) and Section (6) for Hazardous Air Pollutants (HAPs) of the Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

NOV 2 2007

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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 City of St. Louis 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 City of St. Louis 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.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to City of St. Louis Air Pollution Control Program 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 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 Permitting Section at (314) 613-7300. If you prefer to write, please address your correspondence to the City of St. Louis, Air Pollution Control Program, 1415 North 13th Street, St. Louis, Missouri 63106-4424, Attention: Chief of Permitting.

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| Project No. | 2006-10-013 |

## 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."*

Federal Mogul Corporation, Chassis Products  
City of St. Louis

1. Emission Limitation
  - A. Federal Mogul Corporation, Chassis Products shall emit less than 40 tons of Volatile Organic Compounds (VOCs) from the cold boxes in any consecutive 12-month period.
  - B. Attachment A or equivalent forms approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 1(A). Federal Mogul Corporation, Chassis Products shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for all materials used in this equipment.
  - C. Federal Mogul Corporation, Chassis Products shall report to the City of St. Louis Air Pollution Control Program's Enforcement Section, 1415 North 13<sup>th</sup> Street, St. Louis, MO 63106, no later than ten (10) days after the end of the month during which the records from Special Condition Number 1(B) indicate that the source exceeds the limitation of Special Conditions Number 1(A).
2. Maximum Achievable Control Technology (MACT) Requirement  
Federal Mogul Corporation, Chassis Products shall comply with all appropriate monitoring, testing, reporting, and record keeping requirements of 40 CFR Part 63, Subpart EEEEE, *National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries*.
3. Control Device Requirements – Regenerative Thermal Oxidizer (RTO)
  - A. The natural gas-fired regenerative thermal oxidizer (RTO) must be in use at all times when any of the core forming lines are in operation. The RTO shall be operated and maintained in accordance with the manufacturer's specifications to ensure compliance with 40 CFR Part 63, Subpart EEEEE, *National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries*. This destruction/removal efficiency shall be verified through compliance testing, as detailed in Special Condition Number 1 of

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**SPECIAL CONDITIONS:**

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

this permit.

- B. The operating temperature of the RTO shall be continuously monitored and shall equal or exceed the temperature that is determined during the compliance test specified in Special Condition Number 1. The most recent sixty (60) months of records shall be maintained on-site and shall be made immediately available to City of St. Louis Air Pollution Control Program personnel upon request.
- C. Federal Mogul Corporation, Chassis Products shall maintain an operating, maintenance and inspection log for the RTO which shall include the following:
  - 1) Incidents of malfunction(s) including the date(s) and duration of the event, the probable cause, any corrective actions taken and the impact on missions due to the malfunction;
  - 2) Any maintenance activities conducted on the unit, such as replacement of equipment, etc.; and
  - 3) 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 (6) REVIEW

Project Number: 2006-10-013  
Installation ID Number: 510-0072  
Permit Number:

Federal Mogul Corporation, Chassis Products  
3700 Forest Park Avenue  
St. Louis, MO 63108

Complete: 10/10/2006  
Reviewed: 03/08/2007

Parent Company:  
Federal Mogul Corporation  
3700 Forest Park Av.  
St. Louis, MO 63108

City of St. Louis

REVIEW SUMMARY

- Federal Mogul Corporation, Chassis Products has applied for authority to switch its cold box catalyst from Dimethylamine to Triethylamine.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed catalyst switch. HAPs of concern from this process are Triethylamine, Monomeric MDI, Formaldehyde and Phenol.
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart EEEEE, *National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries* applies to the proposed equipment
- A regenerative thermal oxidizer (RTO) is being used to control volatile organic compound (VOC) and HAP emissions from the core resin line equipment (cold box system).
- This review was conducted in accordance with Section (5) for Volatile Organic Compounds (VOCs) and Section (6) for Hazardous Air Pollutants (HAPs) of the Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC for the project are conditioned to de minimis source levels. Potential emissions of HAPs are above major source levels. This installation is, however, subject to a MACT standard and cannot, therefore, be reviewed in accordance with Section (9) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.
- This installation is located in St. Louis City, a non-attainment 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 to determine the impact of VOC or HAP for this review. No screen model is currently available which can accurately predict ambient ozone concentrations caused by this installation's VOC emissions. In addition, HAP emissions from the proposed equipment are subject to a MACT.
- Emissions testing is required for the equipment to meet the requirements of 40 CFR Part 63, Subpart EEEEE, *National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries*
- An application to amend the installations Part 70 operating permit is required within 1 year of catalyst switch.
- Approval of this permit is recommended with special conditions.

### INSTALLATION DESCRIPTION

Federal Mogul Corporation, Chassis Products is located within the City of St. Louis, Missouri. It develops and manufactures after-market brake drums and rotors for the automotive industry.

Federal Mogul Corporation, Chassis Products currently operates under Part 70 operating permit number OP2001-108. The Air Pollution Control Program received a renewal application for this permit on April 11, 2006,

Federal Mogul Corporation, Chassis Products switched its cold box catalyst from Dimethylamine (DMA) to Triethylamine (TEA) without first obtaining a permit from the Air Pollution Control Program as stipulated in 10 CSR 10-6.060(1)(C) of the Air Pollution Control Regulations. The catalyst switch resulted in increased emissions of HAPs.

The following construction permits have been issued to Federal Mogul Corporation, Chassis Products from the City of St. Louis, Air Pollution Control Program.

Table 1. Previously issued construction permits

| Permit Number          | Description                    |
|------------------------|--------------------------------|
| Date issued 12/7/1992* | Installation of dust collector |
| 94-05-026*             | Installation of Dust Collector |
| 94-09-92*              | East Shop Dust Collector       |
| 95-04-043*             | Shakeout Process Line #6       |
| 04-09-017              | Induction Furnaces             |

\* Issued to Cooper-Wagner Brake, a Federal Mogul Corporation, Chassis Products predecessor.

### PROJECT DESCRIPTION

Federal Mogul Corporation, Chassis Products switched its cold box catalyst from Dimethylamine (DMA) to Triethylamine (TEA).

In Iron and Steel Foundries cores are the internal passages of castings. Cores are

made by mixing sand with a chemical binder system. A third part, the catalyst, is introduced in the mixed sand as a gas to 'set' or 'cure' the core. This core process is referred to as a Cold Box System. The sand and binder are mixed and as the sand leaves the mixer it is discharged into the core machine.

The core machine will then shoot the sand under air pressure into the core box. The core box is then 'gassed' with a catalyst to cure the sand. A fume scrubber is used to remove any excess catalyst gas from the machine.

DMA does not contain any HAPs whereas TEA is 100% HAP. Some of the TEA emissions from the cold box system are captured and routed to the RTO for destruction and the rest of it escapes as fugitive emissions. The applicant estimates that only 70% of the TEA being emitted from the cold box system is captured.

### EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis were derived from material safety data sheets. The maximum amount of catalyst used was arrived at by taking actual catalyst usage in 2005 and applying a 50% safety factor to it. The capture efficiency (70%) and RTO control efficiency (95%) were provided by the applicant and will have to be verified through stack testing as per Special Condition number 1. The HAP and VOC potential emissions of this permit application are shown in Table 2 and 3 below.

Table 2. Potential HAP emissions

| Resin Component | HAP                                |          | % Wt HAP in Resin | Resin Usage (lb/hr) | HAP PTE (Tons/year) |             |              |
|-----------------|------------------------------------|----------|-------------------|---------------------|---------------------|-------------|--------------|
|                 | Name                               | CAS      |                   |                     | Fugitive            | Stack       | Total        |
| Sigmacure 703   | Phenol                             | 108-95-2 | 5                 | 20.82               | 1.37                | 0.16        | 1.53         |
|                 | Formaldehyde                       | 50-00-0  | 0.1               |                     | 0.03                | 0.00        | 0.03         |
| Sigmacure 303   | Diphenylmethane 4,4 - Diisocyanate | 101-68-8 | 50                | 17.53               | 11.53               | 1.33        | 12.86        |
| Catalyst        | TEA                                | 12-44-8  | 100               | 13.36               | 17.55               | 2.05        | 19.60        |
| <b>TOTAL</b>    |                                    |          |                   |                     | <b>30.48</b>        | <b>3.54</b> | <b>34.02</b> |

Table 3. Potential VOC emissions

| Resin Component | VOC                                    | % Wt VOC in Resin | Resin Usage (lb/hr) | VOC PTE (Tons/year) |             |              |
|-----------------|--|-------------------|---------------------|---------------------|-------------|--------------|
|                 |  |                   |                     | Fugitive            | Stack       | Total        |
| Sigmacure 703   | Phenol                                 | 35.1              | 20.82               | 9.60                | 1.12        | 10.72        |
|                 | Formaldehyde                           |                   |                     |                     |             |              |
|                 | Dimethyl Succinate                     |                   |                     |                     |             |              |
|                 | Dimethyl Glutarate                     |                   |                     |                     |             |              |
| Sigmacure 303   | Diphenylmethane 4,4 - Diisocyanate     | 100               | 17.53               | 23.05               | 2.68        | 25.73        |
|                 | Polymeric Diphenylmethane Diisocyanate |                   |                     |                     |             |              |
|                 | Isocyanic Acid                         |                   |                     |                     |             |              |
| Catalyst        | TEA                                    | 100               | 13.36               | 17.55               | 2.05        | 19.60        |
| <b>TOTAL</b>    |  |                   |                     | <b>50.20</b>        | <b>5.85</b> | <b>56.05</b> |

Potential emissions of the application represent the potential of the new equipment,

assuming continuous operation (8760 hours per year). The actual existing emissions were taken from the applicant's 2005 Emission Inventory Questionnaire (EIQ) submittal. The following table provides an emissions summary for this project.

Table 4. Emissions Summary (tons per year)

| Pollutant        | Regulatory De Minimis Levels | Existing Potential Emissions | Existing Actual Emissions (2005 EIQ) | Potential Emissions of the Application | Project Conditioned Potential |
|------------------|------------------------------|------------------------------|--------------------------------------|--|-------------------------------|
| PM <sub>10</sub> | 15.0                         | N/D                          | 123.70                               | N/A                                    | N/A                           |
| SO <sub>x</sub>  | 40.0                         | N/D                          | 0.58                                 | N/A                                    | N/A                           |
| NO <sub>x</sub>  | 40.0                         | N/D                          | 0.96                                 | N/A                                    | N/A                           |
| VOC              | 40.0                         | N/D                          | 164.00                               | 56.05                                  | 40.00                         |
| CO               | 100.0                        | N/D                          | 0.2                                  | N/A                                    | N/A                           |
| HAPs             | 10.0/25.0                    | N/D                          | 25.69                                | 34.02                                  | N/A                           |

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

Since Federal Mogul Corporation, Chassis Products is in an ozone non-attainment area its major threshold for VOC is 100 tons per year. The actual VOC emissions for Federal Mogul Corporation, Chassis Products, according to their 2005 EIQ filing, was 164 tons indicating that it is a major source of VOC emissions. To avoid major review the project VOC emissions were limited to 40 tons in any consecutive 12 month period.

#### PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) for Volatile Organic Compounds (VOCs) and Section (6) for Hazardous Air Pollutants (HAP) of the Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC for the project are conditioned to de minimis source levels. Potential emissions of HAPs are above major source levels. This installation is, however, subject to a MACT standard and cannot, therefore, be reviewed in accordance with Section (9) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

#### APPLICABLE REQUIREMENTS

Federal Mogul Corporation, Chassis Products 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 June 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
- *St. Louis City Ordinance 65645*

#### SPECIFIC REQUIREMENTS

- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standard for Hazardous Air Pollutants for Iron and Steel Foundries*, 40 CFR Part 63, Subpart EEEEE.

#### STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5) and Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

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Maurice Chemweno  
Environmental Engineer

Date

## PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated February 8, 2006, received October 10, 2006<sup>1</sup>, designating Federal Mogul Corporation as the owner and operator of the installation.
- Material Safety Data Sheets (MSDS).

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<sup>1</sup> This application was originally submitted to the City of St. Louis Air Pollution Control Program.



Mr. John McClure  
EHS Manager  
Federal Mogul Corporation, Chassis Products  
3700 Forest Park Avenue  
St. Louis, MO 63108

RE: New Source Review Permit - Project Number: 2006-10-013

Dear Mr. McClure:

Enclosed with this letter is your permit to construct. Please study it carefully. Also, note the special conditions, if any, 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 contact Maurice Chemweno or me with the department's Air Pollution Control Program at P.O. Box 176, Jefferson City, MO 65102 or telephone (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Kendall B. Hale  
New Source Review Unit Chief

KBH: mck

Enclosures

c: Permit Section – City of St Louis, Air Pollution Control Program  
PAMS File: 2006-10-013

Permit Number: