

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: **032011-002** Project Number: 2010-12-009
Installation Number: 053-0019
Parent Company: Caterpillar Inc.
Parent Company Address: 100 NE Adams, Peoria, IL 61629
Installation Name: Caterpillar Inc. - High Performance Molded Products
Installation Address: 2416 Mid-America Industrial Drive, Boonville, MO 65233
Location Information: Cooper County, S9, T48N, R17W

Application for Authority to Construct was made for:
Seven rubber injection molding machines (EP-30), an electric cure oven (EP-30), and a grit blaster (EP-15). This review was conducted in accordance with Section (5), 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.

MAR 02 2011

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."

Caterpillar Inc. - High Performance Molded Products
Cooper County, S9, T48N, R17W

1. Emission Limitation

- A. Caterpillar Inc. - High Performance Molded Products shall emit less than 10.0 tons individually and 25.0 tons combined of Hazardous Air Pollutants (HAPs) in any consecutive 12-month period from the entire installation (see Table 1).

Table 1: Installation Emission Points with Potential HAP Emissions

Emission Point	Description
EP-01	Adhesive Paint Booth
EP-02	Natural Gas Fired Drying Oven
EP-03	Two 100-Hp Natural Gas Boilers
EP-04	Slip Seal Adhesive Booth
EP-06	Rubber Mixing
EP-16	Clutch disk curing oven
EP-17	Clutch disk molding
EP-23	19 Rubber Injection Molding Machines / Eight Electric Post Cure Ovens
EP-24	24 Rubber Presses
EP-25	Regenerative Thermal Oxidizer
EP-26	Robotic Spray Booth and Natural Gas Fired Curing Oven
EP-27	Natural Gas Fired Preheat Dryer
EP-30	Seven Rubber Injection Molding Machines / One Electric Post Cure Oven

- B. Caterpillar Inc. - High Performance Molded Products shall emit less than the respective Screening Model Action Level (SMAL) of 1,3-butadiene, aniline, and benzidine in any consecutive 12-month period from the entire installation. Each SMAL is reported in Table 2 and referenced from the *Table of Hazardous Air Pollutants and Screening Model Action Levels*, Air Pollution Control Program, Missouri Department of Natural Resources, Revision 6, August 16, 2010.

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SPECIAL CONDITIONS:

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

Table 2: SMAL

Pollutant	CAS	SMAL (tons per year)
1,3-Butadiene	106-99-0	0.07
Aniline	62-53-3	1
Benzidine	92-87-5	0.0003

- C. Attachments A and B or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.A. Attachments C, D, and E respectively, or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.B.
2. Modeling Compliance - 1,3-butadiene, aniline, and benzidine
If Caterpillar Inc. – High Performance Molded Products requests to remove Special Condition 1.B. after the issuance of this permit, they shall submit a compliant ambient impact analysis for all sources of 1,3-butadiene, aniline, and benzidine added to the installation under this permit (EP-30) and any source added after the issuance of this permit that is not limited to less than the respective SMAL on a project basis.
 3. Control Device Requirement - Filters
 - A. Caterpillar Inc. - High Performance Molded Products shall control emissions from the clutch core grit blaster (EP-15) using cartridge filters and a HEPA filter as specified in the permit application.
 - B. The filters shall be operated and maintained in accordance with the manufacturer's specifications. The cartridge filters shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.
 - C. Replacement cartridge and HEPA filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - D. Caterpillar Inc. - High Performance Molded Products shall monitor and record the operating pressure drop across cartridge filters at least once every 24 hours of operation. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

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SPECIAL CONDITIONS:

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

- E. Caterpillar Inc. - High Performance Molded Products shall maintain an operating and maintenance log for cartridge filters and HEPA filter 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.

- 4. Record Keeping and Reporting Requirements
 - A. Caterpillar Inc. - High Performance Molded Products 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. These records shall include Material Safety Data Sheets (MSDS) for all materials used.

 - B. Caterpillar Inc. - High Performance Molded Products 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 shows an exceedance of a limitation imposed by this permit.

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

Project Number: 2010-12-009
Installation ID Number: 053-0019
Permit Number:

Caterpillar Inc. - High Performance Molded Products Complete: December 3, 2010
2416 Mid-America Industrial Drive
Boonville, MO 65233

Parent Company:
Caterpillar Inc.
100 NE Adams
Peoria, IL 61629

Cooper County, S9, T48N, R17W

REVIEW SUMMARY

- Caterpillar Inc. - High Performance Molded Products has applied for authority to install seven rubber injection molding machines (EP-30), an electric cure oven (EP-30), and a grit blaster (EP-15).
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are from rubber injection molding and curing including 1,3-butadiene (CAS 106-99-0), acetophenone (CAS 98-86-2), aniline (CAS 62-53-3), benzidine (92-87-5), carbon disulfide (CAS 75-15-0), and quinoline (CAS 91-22-5).
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation. None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Cartridge filters and a HEPA filter connected in series are being used to control the particulate matter less than 10 microns in diameter (PM₁₀) and particulate matter less than 2.5 microns in diameter (PM_{2.5}) from the clutch core grit blaster (EP-15) 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 carbon disulfide are above the Screening Model Action Level (SMAL). Potential emissions of 1,3-butadiene, aniline, and benzidine are voluntarily conditioned below the respective SMAL.

- This installation is located in Cooper County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was performed to determine the ambient impact of carbon disulfide.
- Emissions testing are not required for the equipment.
- A modification to the Intermediate Operating Permit is required for this installation within 90 days of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Caterpillar Inc. operates a High Performance Molded Products installation in Boonville, Missouri, herein referred to as CAT. CAT manufactures rubber and plastic seals, gaskets, mounts, and rollers. The installation also produces clutches. CAT is not a major source for HAP emissions due to an installation wide limit. It is a minor source for PM₁₀ and volatile organic compound (VOC) emissions and a de minimis source for sulfur oxides (SO_x), nitrogen oxides (NO_x), and carbon monoxide (CO) emissions under construction permitting. CAT holds an intermediate operating permit. The following permits have been issued to CAT from the Air Pollution Control Program.

Table 3: Permit History

Permit Number	Description
1291-008	Rubber goods manufacturing installation
0893-031	Drying oven
0295-001	Increased production
053-0019-0001	Part 70 operating permit
0198-002	Grit blaster
042002-007	Injection molding equipment
OP2005-035	Part 70 operating permit
102003-020	Injection molding equipment
122004-011	Injection molding equipment
OP2006-080	Intermediate operating permit
122008-005	Spray booth and parts washer

PROJECT DESCRIPTION

CAT proposes to install the equipment listed in Table 4. VOC and HAP emissions from the rubber injection molding presses and curing oven are uncontrolled. There are no other emissions from that equipment. Particulate matter emissions from the grit blaster are controlled by cartridge filters and one HEPA filter connected in series. According to the applicant, the grit blaster will replace the current grit blaster of the same maximum design rate and emission rate. Conservatively, emissions from the grit blaster were included in the project.

Table 4: Project Emission Units

Emission Point	Description	Maximum Hourly Design Rate (MHDR) (tons per hour)
EP-30	M10079 - 250 ton 2.0 L rubber injection molding press	0.06
	M10080 - 250 ton 2.0 L rubber injection molding press	0.06
	M10081 - 250 ton 2.5 L rubber injection molding press	0.08
	M10083 - 560 ton 1.28 L rubber injection molding press	0.06
	M10098 - 160 ton 0.35 L rubber injection molding press	0.02
	M10105 - 160 ton 0.35 L rubber injection molding press	0.02
	250 ton 2.5 L rubber injection molding press	0.08
	Electric post cure oven	0.006
EP-15	Clemco clutch core grit blaster	¹ 0.05

¹ 0.05 tons of media blasted per hour

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis for rubber injection molding and rubber curing were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Draft Section 4.12 *Manufacture of Rubber Products*, 2008. The emission factors for platen press were selected. Conservatively, the highest emission factor for each pollutant was selected, regardless of the rubber compound. Potential emissions of 1,3-butadiene (CAS 106-99-0), acetophenone (CAS 98-86-2), aniline (CAS 62-53-3), benzidine (CAS 92-87-5), carbon disulfide (CAS 75-15-0), and quinoline (CAS 91-22-5) exceed the respective SMAL. The applicant requested installation-wide limitations for 1,3-butadiene, aniline, and benzidine to less than their respective SMAL. This limitation is more stringent than necessary, as the project potential emissions could be limited to less than the SMAL. However, the applicant has decided that the installation-wide limit is the preferred way to limit emissions. Special Condition 2 was added to ensure modeling compliance shall the installation request the installation-wide limitation be removed in the future.

The applicant requested continuation of the installation wide 10/25 ton per year HAP limit. The Air Pollution Control Program has not established a Risk Assessment Level (RAL) for acetophenone or quinoline, therefore their ambient impact was not assessed. Also, no limit was proposed. Carbon disulfide emissions were modeled. Please see the *Ambient Air Quality Impact Analysis* for more information.

Potential emissions for the Clemco brand clutch core grit blaster were calculated using manufacturer supplied data. The enclosed volume of the blaster is 196 cubic feet which exceeds 100 cubic feet; therefore the blaster does not meet the exemption in 10 CSR 10-6.061(3)(B)6.C, and is subject to permitting. All blasted media and debris from the work-piece is fed through a centrifuge/cyclone. Only the lightest particles are sent to the filtration system. The heavier grit media and debris is sent to a 3 deck vibratory screen before being blasted or discarded as large debris or fines. Approximately 80 percent of the original sized media by weight will be reclaimed; approximately 20 percent can be in the filtration system. The blasting cabinet automatically adds virgin media as needed. The manufacturer claims 100 pounds of media is blasted per hour. Breakdown/loss rate is unknown and varies. The manufacturer claims the first control device is 99.7% effective for 0.5 microns. Exhaust from the first control device is connected in series to a second control device, a HEPA filter. The manufacturer claims the HEPA filter is 99.97% effective for 0.3 microns. The HEPA filter exhausts within the production building.

Existing potential emissions are cited from permits 122008-005 and 122004-011. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year.) The following table provides an emissions summary for this project.

Table 5: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2009 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM _{2.5}	10.0	N/D	1.87	7.88E-05	N/D
PM ₁₀	15.0	19.95	3.70	7.88E-05	19.95
SO _x	40.0	0.07	0.01	N/A	0.07
NO _x	40.0	12.06	1.56	N/A	12.06
VOC	40.0	118.02	4.42	22.40	140.42
CO	100.0	13.64	1.31	N/A	13.64
Lead	0.6	N/D	4.7E-03	N/A	N/D
HAPs	10.0/25.0	< 10.0/25.0	N/D	13.19	< 10.0/25.0
1,3-Butadiene	¹ 0.07	0.06	N/D	8.54E-02	< 0.07
Acetophenone	¹ 1	N/D	N/D	1.47	< 10
Aniline	¹ 1	N/D	N/D	3.38	< 1
Benzidine	¹ 0.0003	N/D	N/D	1.51E-02	< 0.0003
Carbon Disulfide	¹ 1	2.79	N/D	4.48	< 10
Quinoline	¹ 0.006	N/D	N/D	6.48E-03	< 10

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

¹ SMAL = Screening Model Action Level

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 carbon disulfide are above the Screening Model Action Level (SMAL). Potential emissions of 1,3-butadiene, aniline, and benzidine are voluntarily conditioned below the respective SMAL.

APPLICABLE REQUIREMENTS

Caterpillar Inc. - High Performance Molded 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 a hardcopy Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions. Alternatively, submission of an electronic copy via MoEIS is required May 1.
- *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

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed to determine the ambient impact of carbon disulfide (CAS 75-15-0). Potential carbon disulfide emissions for the project exceed the SMAL. The analysis was performed using SCREEN3 with worst case theoretical stack parameters and downwash. The results show compliance with the significance level, set at 4% of the Risk Assessment Level (RAL). Therefore, modeling all sources of carbon disulfide from the installation is not required.

Table 6: Modeling Summary

Pollutant	Modeled Impact ($\mu\text{g}/\text{m}^3$)	Significant Impact Level ($\mu\text{g}/\text{m}^3$)	Time Period
Carbon Disulfide	19.5	29.6	24 hour
Carbon Disulfide	3.9	28.0	Annual

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.

David Little
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated November 30, 2010, received December 3, 2010, designating Caterpillar Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Northeast Regional Office Site Survey, dated December 16, 2010.

Mr. Greg Wiswall
EHS Coordinator
Caterpillar Inc. - High Performance Molded Products
2416 Mid-America Industrial Drive
Boonville, MO 65233

RE: New Source Review Permit - Project Number: 2010-12-009

Dear Mr. Wiswall:

Enclosed with this letter is your permit to construct. Please study it carefully. 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 modified 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 David Little, at the Departments' 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

Kendall B. Hale
New Source Review Unit Chief

KBH:dll

Enclosures

c: Northeast Regional Office
PAMS File: 2010-12-009

Permit Number: