

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: **062011-008**

Project Number: 2011-04-058
Installation Number: 021-0115

Parent Company: Bradken

Parent Company Address: 12200 Northwest Ambassador Drive, Suite 647
Kansas City, MO 64163

Installation Name: Bradken

Installation Address: 3811 South 48th Terrace, St. Joseph, MO 64503

Location Information: Buchanan County, S25, T57N, R35W

Application for Authority to Construct was made for:
A custom paint booth for large steel castings. 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.

JUN 17 2011

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James L. Karamanuk".

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 Departments' 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."

Bradken
Buchanan County, S25, T57N, R35W

1. **Superseding Condition**
The conditions of this permit supersede all special conditions found in all previously issued construction permits issued by the Air Pollution Control Program.
2. **Emission Limitation**
 - A. Bradken shall emit less than forty (40.0) tons of Volatile Organic Compounds (VOCs) in any consecutive 12-month period from the entire installation.
 - B. Bradken shall emit less than ten (10.0) tons individually and twenty-five (25.0) tons combined of Hazardous Air Pollutants (HAPs) in any consecutive 12-month period from the entire installation.
 - C. The entire installation includes all equipment/processes installed or permitted at Bradken as of the effective date of this permit, this includes all painting and cleaning activities associated with paint booths (ERP-01, ERP-02, and ERP-05).
 - D. Attachment A, Attachment B, and Attachment C or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.A and 2.B.
3. **Capture Device Requirement – Paint Booths**
 - A. Bradken shall use paint booths (ERP-01, ERP-02, ERP-05) to capture emissions from the airless spray coating activities.
 - B. Bradken shall design and construct each paint booth according to the Occupational Safety and Health Administration (OSHA) requirements, 29 CFR 1910.94(c)(6) *Velocity and air flow requirements*.

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SPECIAL CONDITIONS:

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

- C. Bradken shall demonstrate that each paint booth was constructed according to Special Condition 3.B. by keeping a record of the following design parameters:
 - 1) the minimum recommended face velocity
 - 2) engineering drawings which demonstrate that the spray booth was designed to meet the minimum face velocity
 - D. Bradken shall verify the proper operation of each paint booth by recording the actual face velocity or the actual volumetric airflow for each paint booth at least one time per calendar year (no less than nine calendar months and no more than 15 calendar months following the previous measurement).
4. Control Device Requirement – Overspray Collection System (Paint Booth Filters)
- A. Bradken shall control particulate emissions from all paint booths (ERP-01, ERP-02, and ERP-05) using an overspray collection as specified in the permit application.
 - B. The overspray collection system shall be operated and maintained in accordance with the manufacturer's specifications. The overspray collection system 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 filters for the overspray collection system shall be kept on hand at all times. The filters shall have a control efficiency for total particulate of at least 98.5%.
 - D. Bradken shall monitor and record the operating pressure drop across the overspray collection system at least once every week. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - E. Bradken shall maintain an operating and maintenance log for the overspray collection system 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.

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SPECIAL CONDITIONS:

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

5. **Record Keeping and Reporting Requirements**
 - A. Bradken shall maintain all records required by this permit for not less than five (5) 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 at the installation.
 - B. Bradken shall report to the Air Pollution Control Program's 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.
6. **Operational Requirement**

Bradken shall keep the VOC-containing solvents and cleaning solutions in sealed containers whenever the materials are not in use. Bradken shall provide and maintain suitable, easily read, permanent markings on all paint, solvent and cleaning solution containers used with this equipment.

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

Project Number: 2011-04-058
Installation ID Number: 021-0115
Permit Number:

Bradken
3811 South 48th Terrace
St. Joseph, MO 64503

Complete: April 25, 2011

Parent Company:
Bradken
12200 Northwest Ambassador Drive, Suite 647
Kansas City, MO 64163

Buchanan County, S25, T57N, R35W

REVIEW SUMMARY

- Bradken has applied for the authority to construct a paint booth (ERP-05) for painting large steel castings.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from painting include xylene (all isomers), ethyl benzene (100-41-4), and toluene (CAS 108-88-3).
- None of the New Source Performance Standards (NSPS) apply to the installation.
- 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.
 - 40 CFR 63, Subpart Mmmm, *National Emission Standards for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products*, does not apply to the installation because it is not a major source of HAPs.
 - 40 CFR 63, Subparts HHHHHH, *National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources*, and XXXXXX, *National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories*, do not apply to this process because the paints do not contain the target HAPs.
- Fabric filters are being used to control emissions of particulate matter less than 10 microns and 2.5 microns in diameter (PM₁₀ and PM_{2.5} respectively) from the paint booths (ERP-01, ERP-02, and ERP-05).

- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC and HAPs are conditioned below de minimis levels.
- This installation is located in Buchanan 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 not performed since potential emissions of the application are below de minimis levels.
- Emissions testing are not required for the equipment.
- No Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Bradken operates a machine shop that produces large steel components for industrial vehicles, such as locomotives and heavy construction equipment. The steel castings are formed in a Bradken foundry located in Atchison, Kansas and are transported to the St. Joseph facility for finishing. The installation has two existing paint booths (ERP-01 and ERP-02) and is a synthetic de minimis source of VOC and HAPs.

In 2008, Bradken acquired all emission units and process equipment formerly operated by Atchison Steel Casting & Machining. The following permits have been issued to the installation from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
042004-007	Two Paint Booths (ERP-01 and ERP-02)

PROJECT DESCRIPTION

Bradken proposes to install a third paint booth (ERP-05) in order to increase the safety and efficiency of the painting operation. The new paint booth will be used to finish components that the facility already has the capability to finish. However, the new paint booth will be designed to load-in and load-out parts utilizing a custom hoist and jig system. The new loading system will greatly increase the productivity of the painting operation because the massive size and weight of the castings make the current material transfer process both hazardous and time-consuming.

Bradken will use an airless hydraulic atomization spray coating system. Bradken estimated that the maximum amount of time they could be applying paint would be 3 hours in a 16 hour day. Bradken could not paint continuously because the large steel castings will be laid out, painted, dried, and flipped to paint the other side. Overall, this is a time intensive process as the castings are greater than six feet across, weigh several tons a piece, and are difficult to reposition. Therefore, the maximum design rate was based on a maximum utilization of 18.75% and the maximum applicator rate of 0.31 gallons per minute resulting in a maximum hourly design rate of 3.5 gallons per hour. Potential VOC and HAP emissions are also expected from the cleaning of the spray gun. However, Bradken cleans the spray gun with a butyl acetate paint thinner and recycles the thinner back into the paint mix. Bradken based the maximum design rate associated with cleaning the spray guns on a historical usage rate of 5 gallons thinner per 100 gallons of paint used.

EMISSIONS/CONTROLS EVALUATION

Potential emissions of VOC and HAPs were calculated by the applicant using a mass balance approach and assuming 100% emitted. According to the EPA document entitled, *Sources and Control of Volatile Organic Air Pollutants*, APTI Course 482, Third Edition (November 2002) airless spray coating of large flat surfaces can achieve 75% transfer efficiency. Therefore, particulate emissions from the painting activities were calculated using a mass balance approach and assuming a 25% overspray. Painting will occur in a 3-sided paint booth that will have an overspray collection system comprised of a wall of filters. The filter manufacturer's specifications indicate that the control efficiency will be at least 98.5% for total particulate matter (PM). A 90% capture efficiency was assumed for the 3-sided paint booth. As there is not a particle size distribution available for this type of painting, all PM was assumed to be PM_{2.5}.

Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year.) The new installation conditioned potential includes the new equipment and the existing equipment (ERP-01 and ERP-02) because the previous permit did not consider the use of the overspray collection systems. The following table provides an emissions summary for this project.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions ^[1]	Existing Actual Emissions (2010 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM _{2.5}	10.0	N/D	N/A	2.71	8.13
PM ₁₀	15.0	13.4	N/A	2.71	8.13
SO _x	40.0	N/A	N/A	N/A	N/A
NO _x	40.0	N/A	N/A	N/A	N/A
VOC	40.0	<40	7.84	80.41	<40
CO	100.0	N/A	N/A	N/A	N/A
Xylene	10.0	N/D	5.83	49.51	<10
HAPs	10.0/25.0	<10/25	7.57	61.86	<10/25

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

¹Existing potential emissions obtained from permit number 042004-007

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 VOC and HAPs are conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

Bradken 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.

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 by April 1 for the previous year's emissions. Otherwise, submission of an electronic EIQ via MOEIS is required by May 1.
- *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

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400 does not apply to the paint booths (ERP-01, ERP-02, ERP-05) because they are controlled with a filter expected to achieve at least 90% control efficiency.

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.

Kathi Jantz
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated April 19, 2011, received April 25, 2011, designating Bradken as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Kansas City Regional Office Site Survey, dated May 5, 2011.
- Material Safety Data Sheets

Attachment B – Monthly Individual HAP Compliance Worksheet

Bradken
 Buchanan County, S25, T57N, R35W
 Project Number: 2011-04-058
 Installation ID Number: 021-0115
 Permit Number: _____

HAP Name: _____ CAS No.: _____

This sheet covers the month of _____ in the year _____.

Column 1	Column 2	Column 3	Column 4 (a)	Column 5 (b)
Material Used (Name)	Amount of Material Used (Include Units)	Density (Pounds per Gallon)	HAP Content (Weight %)	HAP Emissions (Tons)
(c) Total Individual HAP Emissions Calculated for this Month in Tons:				
(d) Last Month's 12-Month Individual HAP Emissions Total, in Tons:				
(e) Previous Year's Monthly Individual HAP Emissions Total, in Tons:				
(f) Current 12-month Total of Individual HAP Emissions in Tons: [(c) + (d) - (e)]				

Instructions: This worksheet must include HAP emissions from all emission units installed or permitted at the time of permit issuance. Complete a new worksheet for each individual HAP.

- (a) HAP content should be obtained from the Material Safety Data Sheet (MSDS) and should represent the total mass of the HAP compound by weight. If the content is given as a range, then the maximum value should be used.
- (b) 1) If usage is in tons - [Column 2] x [Column 4] = [Column 5];
 2) If usage is in pounds - [Column 2] x [Column 4] x [0.0005] = [Column 5];
 3) If usage is in gallons - [Column 2] x [Column 3] x [Column 4] x [0.0005] = [Column 5];
- (c) Summation of [Column 5] in Tons;
- (d) 12-Month Individual HAP emissions (f) from last month's Attachment B in Tons;
- (e) Monthly Individual HAP emissions total (c) from the previous year's Attachment B in Tons; and
- (f) Calculate the new 12-month Individual HAP emissions total. **A 12-Month Individual HAP emissions total (f) of less than 10.0 tons for each individual HAP indicates compliance.**

Attachment C - Monthly Combined HAPs Tracking Record

Bradken
 Buchanan County, S25, T57N, R35W
 Project Number: 2011-04-058
 Installation ID Number: 021-0115
 Permit Number: _____

This sheet covers the month of _____ in the year _____.

Column 1	Column 2	Column 3 (a)
Individual HAP Name	Individual HAP CAS number	Total Individual Monthly HAP emissions (tons)
Toluene	108-88-3	
Ethyl benzene	100-41-4	
Xylene	(All Isomers)	
(b) Total Combined HAP Emissions Calculated for this Month, in Tons:		
(c) Previous Month's 12-Month HAP Emissions Total, in Tons:		
(d) Previous Year's Monthly HAP Emissions Total, in Tons:		
(e) Current 12-month Total of HAP Emissions in Tons: [(b) + (c) - (d)]:		

Instructions: This worksheet must include HAP emissions from all emission units installed or permitted at the time of permit issuance. Obtain information for Column 1 and Column 2 and Column 3 from Attachment B

(a) Record the total monthly individual HAP emissions total from (c) from the current month's Attachment B
 (b) Summation of [Column 3] in Tons;
 (c) Record the previous 12-Month combined HAP emission total (e) from last month's Attachment C, in Tons;
 (d) Record the monthly HAP emission total (b) from previously year's Attachment C, in Tons; and
 (e) Calculate the new 12-month combined HAP emissions total. **A 12-Month Combined HAP emissions total (e) of less than 25.0 tons indicates compliance.**

Mr. Chris Thimes
Environmental, Health, and Safety Manager
Bradken
3811 South 48th Terrace
St. Joseph, MO 64503

RE: New Source Review Permit - Project Number: 2011-04-058

Dear Mr. Thimes:

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 and your new source review permit application 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 Kathi Jantz, at the Department's 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:kjl

Enclosures

c: Kansas City Regional Office
PAMS File: 2011-04-058

Permit Number: