

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: **052011-010** Project Number: 2011-02-019

Installation Number: 021-0009

Parent Company: Johnson Controls Battery Group, Inc.

Parent Company Address: P.O. Box 591, Milwaukee, WI 53201

Installation Name: Johnson Controls Battery Group, Inc.

Installation Address: 4722 Pear Street, Saint Joseph, MO 64503

Location Information: Buchanan County, S25, T57N, R35W

Application for Authority to Construct was made for:
Absorbent glass mat battery manufacturing equipment. 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.

MAY 23 2011

EFFECTIVE DATE

A handwritten signature in cursive script, appearing to read "James L. 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 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."

Johnson Controls Battery Group, Inc.
Buchanan County, S25, T57N, R35W

1. Control Device Requirement-Baghouse
 - A. Johnson Controls Battery Group, Inc. shall control emissions from the (EU13A) AGM plate stacker, (EU13B) AGM plate stacker, and (COS 13) AGM cast on strap line using baghouse 12 equipped with a high efficiency particulate air (HEPA) filter at EP-452 as specified in the permit application.
 - B. The baghouse equipped with a HEPA filter shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse equipped with a HEPA filter 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 baghouse and HEPA filter 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).
 - D. Johnson Controls Battery Group, Inc. shall monitor and record the operating pressure drop across the baghouse equipped with a HEPA filter at least once every week. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - E. Johnson Controls Battery Group, Inc. shall maintain an operating and maintenance log for the baghouse equipped with a 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.

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SPECIAL CONDITIONS:

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

2. Control Device Requirement-Oil Mist Filter
 - A. Johnson Controls Battery Group, Inc. shall control emissions from AGM post builder (APB 13) using an oil mist filter at EP-453 as specified in the permit application.
 - B. The oil mist filter shall be operated and maintained in accordance with the manufacturer's specifications. The oil mist filter 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 oil mist filter 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. Johnson Controls Battery Group, Inc. shall monitor and record the operating pressure drop across the oil mist filter at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - E. Johnson Controls Battery Group, Inc. shall maintain an operating and maintenance log for the oil mist 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.
3. Record Keeping and Reporting Requirements
 - A. Johnson Controls Battery Group, Inc. 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. Johnson Controls Battery Group, Inc. 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.

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SPECIAL CONDITIONS:

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

4. Performance Testing

- A. Johnson Controls Battery Group, Inc. shall perform lead emission performance testing on EP-452 and EP-453. The performance testing shall be completed in accordance with New Source Performance Standards (NSPS) 40 CFR 60 Subpart KK, *New Source Performance Standards for Lead-Acid Battery Manufacturing Plants* and National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT) 40 CFR Part 63 Subpart PPPPPP, *National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources*.
- B. These tests shall be performed within 60 days after achieving the maximum production rate of the proposed equipment, but not later than 180 days after initial start-up for commercial operation.
- C. A completed Proposed Test Plan Form (enclosed) must be submitted to the Air Pollution Control Program 30 days prior to the proposed test date so that the Air Pollution Control Program may arrange a pretest meeting, if necessary, and assure that the test date is acceptable for an observer to be present. The Proposed Test Plan may serve the purpose of notification and must be approved by the Director prior to conducting the required emission testing.
- D. Two copies of a written report of the performance test results shall be submitted to the Director within 30 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one sample run.
- E. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.
- F. No later than 30 days after the performance test results are submitted, Johnson Controls Battery Group, Inc. shall provide the Director with a report that establishes the lead emission factors and stack parameters (stack height, inside diameter, temperature, exit velocity, and flowrate) for EP-452 and EP-453. The report shall establish the emission factors in units of grains per dry standard cubic feet in scientific notation to the hundredths decimal place. The report shall establish the stack

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SPECIAL CONDITIONS:

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

parameters in United States customary units to the hundredths decimal place.

- G. If the results of the performance testing show that either the emission factors are greater than those used in the emissions analysis herein (Table 1), or that the stack parameters significantly differ from those used in the emissions analysis herein then Johnson Controls Battery Group, Inc. shall evaluate what effects these differences would have had on the permit applicability and modeling applicability of this project. Johnson Controls Battery Group, Inc. shall submit the results of any such evaluation within 30 days of submitting the report required in Special Condition 4.F. of this permit.

Table 1: Emission Factors and Stack Parameters

Emission Point	Lead Emission Factor (gr/dscf)	Stack Height (ft)	Stack Inside Diameter (ft)	Stack Temperature (F)	Stack Velocity (fps)	Stack Flowrate (scfm)
EP-452	1.00E-05	43.99	3.99	69.77	3,582.64	45,000
EP-453	4.50E-05	33.00	0.33	119	570.86	50

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

Project Number: 2011-02-019
Installation ID Number: 021-0009
Permit Number:

Johnson Controls Battery Group, Inc.
4722 Pear Street
Saint Joseph, MO 64503

Complete: February 18, 2011

Parent Company:
Johnson Controls Battery Group, Inc.
P.O. Box 591
Milwaukee, WI 53201

Buchanan County, S25, T57N, R35W

REVIEW SUMMARY

- Johnson Controls Battery Group, Inc. has applied for authority to install absorbent glass mat battery manufacturing equipment.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. The HAP of concern from this process is lead compounds.
- New Source Performance Standards (NSPS) 40 CFR 60 Subpart KK, *Standards of Performance for Lead-Acid Battery Manufacturing Plants* applies to the installation and proposed equipment.
- National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT) 40 CFR 63 Subpart PPPPPP, *National Emission Standards for Hazardous Air Pollutants for Lead Acid Battery Manufacturing Area Sources* applies to the installation and proposed equipment.
- Baghouse 12 including a secondary HEPA filter will control particulate matter (PM) and lead emissions from (EU13A) AGM plate stacker, (EU13B) AGM plate stacker, and (COS 13) AGM cast on strap line. The shared emission point is EP-452. An oil mist filter will control PM and lead emissions from (APB 13) automatic post builder. The emission point is EP-453. Fire hazard reduction filters will control volatile organic compound (VOC) and PM emissions from AGM Heat Seal 13. The emission point is EP-454.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

- This installation is located in Buchanan County, an attainment area for all criteria pollutants.
- This installation is on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation is classified as item number 27. *Any other stationary source category which, as of August 7, 1980, is being regulated under section 111 or 112 of the Act, because 40 CFR 60 Subpart KK, Standards of Performance for Lead-Acid Battery Manufacturing Plants* applies to the equipment. The installation's major source level is 250 tons per year and fugitive emissions are counted toward major source applicability.
- Ambient air quality modeling was performed to determine the ambient impact of lead.
- Emissions testing are required for the equipment.
- A Basic Operating Permit application is required for this installation within 30 days of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Johnson Controls Battery Group, Inc. (JCBGI) operates an existing battery manufacturing installation in Saint Joseph, Missouri. JCBGI is a minor source of PM₁₀ and a de minimis source of lead compounds under construction permits and holds a basic operating permit. The following permits have been issued to JCBGI from the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
0381-004	Replacement of four plate stackers on COS lines #2 through 5
0281-003	Installation of a central vacuum cleaner
1182-002	Installation of two OSI tunnel type drying ovens for lead paste
0185-004	Increase production by installing an additional lead-acid battery manufacturing line
0485-011	Installation of a second COS line
0788-006	Installation of a scrap lead plate salvage tumbler
0290-013	Installation of a Chem Set/Steam Chamber
1090-004	New pastemixer and strip caster to produce lead strip for casting
0492-012	Replacement of battery plate stackers on COS lines 2, 3, and 7 and upgrade COS operations and heat sealers on COS 2 and 3
1192-015	Replacement of the existing RADCO vacuum system and a Mark V COS line
0793-026	Increase production by modifying existing equipment
0194-009	Installation of three new JCI pasters and a JCI-II vacuum stacker
1294-010	Installation of a chemset chamber, two lead oxide storage tanks, two trim dry ovens, expanded metal plate making system #2, a lead cylinder caster and two lead oxide mills

0895-035	Installation of COS Line #9
0196-015	Installation of a lead cylinder caster, two Sovema lead oxide mills and a storage tank system
0796-014	Installation of a new pasting line, four new Sovema Mills, and one cylinder caster lead pot and caster units and the modification of chemset chambers #1, #2, and #3
1199-007	Installation of a single lead pot to support the existing five (5) cylinder casters
032003-030	Increase in production at the existing lead-acid battery manufacturing plant
062006-008	Modification to existing Chemsets and addition of new Chemset
OP	Basic operating permit project 2006-04-014
112006-002	Installation of two additional lead oxide manufacturing ball mills and an additional cylinder casting lead
102009-010	Installation of alternative COS line
062010-010	Installation of a curing set

PROJECT DESCRIPTION

JCBGI is installing absorbent glass mat (AGM) battery manufacturing equipment including two plate stackers (Stackers 13A and 13B), one cast on strap line (COS 13), one automated post builder (APB 13), and one heat seal (Heat Seal 13). Emissions from the stackers and cast on strap line are controlled by baghouse 12 with a secondary HEPA filter. MACT Subpart P allows the baghouse equipped with HEPA filtration to be monitored only once per week, rather than once per day. The emission point is EP-452. Emissions from the automated post builder are controlled by an oil mist filter. The emission point is EP-453. Emissions from the heat seal are controlled by a fire hazard reduction filter, inherent to the process. The emission point is EP-454.

According to the application, AGM batteries have not been mass produced at the installation. The maximum hourly design rate (MHDR) of the AGM line will be 600 batteries per hour. Cured positive and negative plates from the existing chemset units will be transferred to Stacker 13A and 13B and will be stacked in opposing order with insulators or spacers in between each plate. At the COS line (COS 13), stacked plates will be fed to the COS machine where molten lead will be poured around the plate lugs to form a strap to connect the elements. Battery posts will be installed by the automated post builder (APB 13), and a plastic cover will be heat sealed (Heat Seal 13) to the battery case. The chemsets were previously permitted at their maximum design rates, however they have not operated at their maximum rates due to restrictions in the COS. This project will allow the chemsets to operate above previously used rates, but still below the maximum rates. Potential emissions from debottlenecking the chemsets were not included in this review as the emissions are small and the chemsets have been modeled at their maximum design rates; no other requirements are triggered.

EMISSIONS/CONTROLS EVALUATION

The emission factors used in this analysis were obtained from JCBGI engineering knowledge and prior performance tests at the installation. Emission factors for the new equipment will be verified from performance testing required by NSPS Subpart KK.

Conservatively, it was assumed that all particulate matter emissions are less than 2.5 microns in diameter. Existing potential emissions are cited as the sum of potential PM₁₀ emissions from permit 032003-030 and all permits issued up to this project. 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.

Elemental lead is not considered a hazardous air pollutant. However, the lead portion of lead compounds (in addition to elemental lead) is considered a criteria pollutant. The entire mass of the compound is used to determine HAP emissions towards modeling applicability. The lead in AGM batteries is typically a high purity. Conservatively, all lead emissions were counted towards criteria and HAP emissions.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2010 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM _{2.5}	10.0	N/D	3.85	0.28	N/A
PM ₁₀	15.0	24.12	6.95	0.28	N/A
SO _x	40.0	N/D	0.35	N/A	N/A
NO _x	40.0	N/D	5.78	N/A	N/A
VOC	40.0	N/D	0.38	1.31E-04	N/A
CO	100.0	N/D	4.86	N/A	N/A
HAPs	10.0/25.0	N/D	0.00	0.017	N/A
Lead	0.6	N/D	0.18	0.017	N/A
Lead Compounds	¹ 0.01	N/D	0.18	0.017	N/A

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

¹ Screening Model Action Level (SMAL)

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 all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

Johnson Controls Battery Group, 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 a hardcopy Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions. Alternatively, 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 Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Lead-Acid Battery Manufacturing Plants*, 40 CFR Part 60, Subpart KK.
- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Lead Acid Battery Manufacturing Area Sources*, 40 CFR Part 63, Subpart P.00000.

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed to determine the ambient impact of lead. The potential emissions of lead from this project exceed the screening model action level (SMAL) of 0.01 tons per year. Current policy calls for the modeling of all sources of a HAP at an installation if the screening model action level is exceeded for the project. The installation was modeled for compliance with the national ambient air quality standards (NAAQS) and risk assessment levels (RALs). The modeling results indicate compliance with the NAAQS and RAL. No further action is required. For further details see the document entitled *Ambient Air Quality Impact Analysis (AAQIA) for Johnson Controls Battery Group, Inc.* March 25, 2011.

Table 4: Modeling Summary

Pollutant	Modeled Impact ($\mu\text{g}/\text{m}^3$)	NAAQS / RAL ($\mu\text{g}/\text{m}^3$)	Time Period
Lead	0.1145	0.15	3-month
Lead	0.4890	2	8-hour
Lead	0.3533	0.357	24-hour
Lead	0.0688	0.7	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 February 10, 2011, received February 14, 2011, designating Johnson Controls Battery Group, Inc. 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 March 22, 2011.
- Missouri Department of Natural Resources Air Pollution Control Program Memorandum, *Ambient Air Quality Impact Analysis (AAQIA) for Johnson Controls Battery Group, Inc.* dated March 25, 2011.

Ms. Debbie Hastings
Senior Environmental Engineer
Johnson Controls Battery Group, Inc.
P.O. Box 591
Milwaukee, WI 53201

RE: New Source Review Permit - Project Number: 2011-02-019

Dear Ms. Hastings:

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 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 do not hesitate to contact David Little, 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:dll

Enclosures

c: Kansas City Regional Office
PAMS File: 2011-02-019

Permit Number: