

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: **062011-001**

Project Number: 2011-03-035
Installation Number: 183-0077

Parent Company: O'Fallon Casting

Parent Company Address: 600 Cannonball Lane, O'Fallon, MO 63366

Installation Name: O'Fallon Casting

Installation Address: 600 Cannonball Lane, O'Fallon, MO 63366

Location Information: St. Charles County, S27, T47N, R3E

Application for Authority to Construct was made for:

The installation of a new Unitherm Electric Shell Pre-Heat Furnace. This review was conducted in accordance with Section (6), 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 7 2011

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James K. Hancock", written over a horizontal line.
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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Project No.	2011-03-035

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."

O'Fallon Casting
St. Charles County, S27, T47N, R3E

1. Annual Emission Limit of Volatile Organic Compounds (VOC)
 - A. O'Fallon Casting shall emit into the atmosphere less than 100 tons of Volatile Organic Compounds (VOC) from the entire installation in any 12-month period. The entire installation applies to all equipment permitted and/or operated at the installation as of the date of issuance of the permit
 - B. Attachment A or equivalent forms, such as electronic forms, which contain the same calculation method as Attachment A shall be used to demonstrate compliance with Special Conditions 1.A.
2. Record Keeping Requirement
The operator(s) 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.
3. Reporting Requirement
The operator(s) shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after any exceedances of the limitations imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW

Project Number: 2011-03-035
Installation ID Number: 183-0077
Permit Number:

O'Fallon Casting
600 Cannonball Lane
O'Fallon, MO 63366

Complete: March 14, 2011

Parent Company:
O'Fallon Casting
600 Cannonball Lane
O'Fallon, MO 63366

St. Charles County, S27, T47N, R3E

REVIEW SUMMARY

- O'Fallon Casting has applied for authority to install a new Unitherm Electric Shell Pre-Heat Furnace.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment but they are not expected to exceed the Screen Modeling Action Levels (SMAL).
- None of the New Source Performance Standards (NSPS) apply to the installation.
- 40 CFR Part 61, Subpart C, *National Emission Standards for Beryllium* of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) regulations applies to this installation but not to the project. 40 CFR Part 63, Subpart RRR, *National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production* of the Maximum Achievable Control Technology (MACT) regulations does not apply to the proposed equipment because O'Fallon Casting is a nonferrous aluminum foundry that melts only clean and internal scrap which is exempt from this MACT. 40 CFR Part 63, Subpart ZZZZZZ, *National Emission Standards for Hazardous Air Pollutants Area Source Standards for Aluminum, Copper, and Other Nonferrous Foundries* of the Maximum Achievable Control Technology (MACT) regulations does not apply to the proposed equipment according to a determination made by the Environmental Protection Agency Region 7 presented to O'Fallon Casting.
- No air pollution control equipment is being used in association with the new equipment.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of VOC are above de minimis levels.

- This installation is located in St. Charles County, a nonattainment area for the 8-hour ozone standard and the PM-2.5 standard and an attainment area for all other 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 for this review. No model is currently available which can accurately predict ambient ozone concentrations caused by this installation's VOC emissions.
- Emissions testing are not required for the equipment.
- An amendment to the existing Part 70 Operating Permit is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

O'Fallon Casting is a aluminum, copper, and beryllium casting plant located in O'Fallon, Missouri in St. Charles county. St. Charles County is a nonattainment area for ozone (O₃) therefore a 100 ton limit for VOC is required to be considered a minor source for construction permits. O'Fallon Casting has the potential to emit (PTE) over the major level for VOC and has taken a voluntary limit of 100 tons of VOCs per year and is currently operating under a Part 70 Operating Permit.

Because this plant is grandfathered and no significant changes have occurred to the plant, no construction permits have been issued to O'Fallon Casting from the Air Pollution Control Program.

The following operating permits have been issued to O'Fallon Casting from the Air Pollution Control Program.

Permit Number	Description
OP1999-170	Nonferrous Investment Castings (Part 70)
OP2002-049	RACT Compliance (Part 70)
OP2002-049A	Change Responsible Official
OP2002-049B	Change Responsible Official
OP2007-043	Part 70 Operating Permit Renewal

PROJECT DESCRIPTION

O'Fallon Casting is installing a new Unitherm Electric Shell Pre-Heat Furnace. The new preheat furnace will be powered by utility power and has a maximum hourly design rate of 0.614 MMBTU/hr. The new preheat furnace will be used to preheat the shell molds before the aluminum is poured. No emissions are expected from the preheat process however the new preheat furnace will potentially increase the capacity of plant. Prior to the new furnace being installed, O'Fallon Casting could cast 2000 pounds of aluminum per eight hour shift. After the new Unitherm Electric Shell Pre-Heat Furnace is installed, O'Fallon Casting will be able to cast 3500 pounds of aluminum per eight hour shift.

EMISSIONS/CONTROLS EVALUATION

As stated in the project description O'Fallon Casting was able to cast 2000 pounds of aluminum per eight hour shift prior to the new Unitherm Electric Shell Pre-Heat Furnace being installed. After the installation of the new Unitherm Electric Shell Pre-Heat Furnace O'Fallon Casting will be able to cast 3500 pounds of aluminum per eight hour shift. This is a 75 percent increase in capacity. O'Fallon Casting stated that a 75 percent increase was not possible due to the size of their sprue tree assembly line. The sprue tree assembly line consists of 74 hooks on which wax casts of finished products are placed on to be transported to the Shell Building room (EP-4). At current capacity O'Fallon Casting can only utilize 45 to 55 hooks on the assembly line. So at maximum capacity of the sprue tree assembly line, using all 74 hooks, the maximum potential increase in plant capacity would be 60 percent. To calculate the potential emissions increase, a potential emissions minus actual emissions approach was taken. Once the potential emissions of the each affected emission point was calculated, the 2010 actual emissions were subtracted to come up with the project potential emissions.

O'Fallon Casting's main pollutant of concern is volatile organic compounds (VOC). The majority of VOC emissions from the plant occur in the Shell Building (EP-4). The Shell Building consists of taking wax formations of desired end products and dipping them into a liquid slurry. The liquid slurry eventually hardens to form a mold around the wax formation. From the Shell Building room the mold is taken to a wax burn out furnace and wax is melted from the mold to form a completed mold. The liquid slurry used to form the molds consists of materials that have very high VOC content. In order to calculate the potential emissions increase from the Shell Building (EP-4) as a result of the installation of the new Unitherm Electric Shell Pre-Heat Furnace the total VOC emissions for 2010 was taken and divided by the hours of operation. That calculation resulted in pounds per hour VOC emission rate. As stated in the paragraph above O'Fallon Casting's capacity is potentially being increased by 60 percent so to calculate the potential VOC emissions increase from the Shell Building (EP-4) the 2010 pound per hour VOC emission rate was increased by 60 percent and multiplied by 8760 hours of operation which results in the total potential VOC emissions from the Shell Building (EP-4). To calculate the project potential VOC emissions from the Shell Building (EP-4) the total potential VOC emissions was subtracted by the actual 2010 emissions. These emission calculations do not take into account the recovered waste slurry that is disposed of which contains VOC's, or the 10.6% destruction rate of VOC that occurs during the wax burnout operation.

The only emissions from the Wax Assembly (EP-2 and EP-3), the Boiler/Autoclave (EP-5), the Wax Burnout (EP-6, EP-7, and EP-8), the existing Pre-Heat Foundry Furnaces (EP-9 and EP-10), Natural Gas Fired Melting Pot (EP-11) and the T-6 Aging Furnaces (EP-19 and EP-21) are from natural gas combustion. To calculate the project potential emissions from these emission points the potential emissions from the natural gas combustion was subtracted from the 2010 actual emissions. Emission factors from Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4, *Natural Gas Combustion (7/98)* and the Factor Information Retrieval (FIRE) source classification code (SCC) 3-04-900-03, 1-02-006-03, and 3-90-006-89 were used to calculate the potential emissions from these emissions points.

Potential Emissions from the Aluminum Melting Pots (EP-12), Aluminum Casting (EP-13), Hand Sanders (EP-17) and Gate Grinding (Emission Point not assigned) are based on the amount of metal poured. As stated above O'Fallon Casting will be able to pour 3500 pounds of aluminum as a result of the new Unitherm Electric Shell Pre-Heat Furnace which is a 1500 pound increase. To calculate the project potential emissions from these emission points the total potential emissions from the increase in metal poured was subtracted from the 2010 actual emissions. Emission factors from the Factor Information Retrieval (FIRE) source classification code (SCC) 3-04-001-03, 3-04-001-14, and 3-04-003-50 were used to calculate the potential emissions from these emissions points.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	¹ Existing Potential Emissions	² Existing Actual Emissions (2010 EI _Q)	³ Potential Emissions After 60 Percent Increase in Capacity	⁴ Potential Emissions of the Application	⁵ New Installation Conditioned Potential
PM _{2.5}	10.0	4.16	0.54	4.16	3.41	N/A
PM ₁₀	15.0	4.59	0.63	4.58	3.74	N/A
SO _x	40.0	0.062	0.01	0.061	0.045	N/A
NO _x	40.0	9.40	1.85	9.18	6.36	N/A
VOC	40.0	86.95	45.72	151.73	94.80	<100.00
CO	100.0	5.93	1.55	5.91	3.92	N/A
HAPs	10.0/25.0	0.97	0.00	0.81	0.50	N/A

N/A = Not Applicable

- ¹ Existing Potential Emissions were calculated using the maximum hourly design rate of each emission point considering a bottleneck in the Preheat Furnace Process to where only 2000 pounds of aluminum could be per eight hour shift. The Shell Building (EP-4) existing potential emissions were calculated using actual usage numbers scaled up to 8760 hours of operation.
- ² Existing Actual Emissions were taken from Emission Inventory Questionnaire for 2010. The emissions reported do not include any emission point that were deemed insignificant amount of emissions.
- ³ Potential Emissions After 60 Percent Increase in Capacity take into account the bottleneck in Shell Building as discussed in the Emissions/Controls Evaluation section of this permit. All emission points affected by the installation of the new Unitherm Electric Shell Pre-Heat Furnace are included in these numbers.
- ⁴ Potential Emissions of the Application represent the Potential minus Actual emissions calculation. The potential emissions values found in the Potential Emissions After 60 Percent Increase column were used in the Potential minus Actual calculation. The actual emissions values found in the spreadsheet attached to permit were used Potential minus Actual calculation. The actual emission values include all emission points affected by the installation of the new Unitherm Electric Shell Pre-Heat Furnace.
- ⁵ The New Installation Conditioned Potential consists of a voluntary 100 ton per year VOC limit for the entire installation. O'Fallon Casting currently has a 100 ton per year VOC limit in their Part 70 operating permit.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC are above de minimis levels.

APPLICABLE REQUIREMENTS

O'Fallon Casting 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
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

SPECIFIC REQUIREMENTS

- 10 CSR 10-6.080 – *National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Beryllium*, 40 CFR Part 61, Subpart C
- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260
- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-3.060

STAFF RECOMMENDATION

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

Gerad Fox
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 11, 2011, received March 14, 2011, designating O'Fallon Casting as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- St. Louis Regional Office Site Survey, dated March 24, 2011.

Mr. Joe Kaufman
Environmental Specialist
O'Fallon Casting
600 Cannonball Lane
O'Fallon, MO 63366

RE: New Source Review Permit - Project Number: 2011-03-035

Dear Mr. Kaufman:

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 do not hesitate to contact Gerad Fox, 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:gfl

Enclosures

c: St. Louis Regional Office
PAMS File: 2011-03-035

Permit Number: