

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: **07 2 0 0 9 - 0 2 1** Project Number: 2009-02-019

Parent Company: Quaker Window Products

Parent Company Address: P.O. Box 128, Freeburg, MO 65305

Installation Name: Quaker Window Products

Installation Address: 504 Highway 63 South, Freeburg, MO 65035

Location Information: Osage County, S10, T41N, R9W

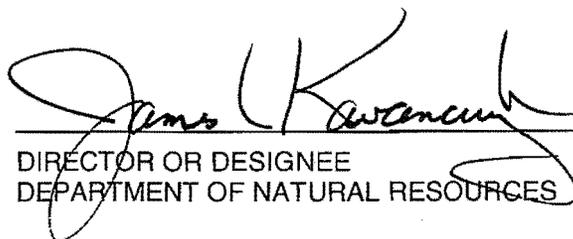
Application for Authority to Construct was made for: replacement of manual operated Thermal Fill and Debridge process equipment with automated equipment. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

JUL 30 2009

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 departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. 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 this (these) air contaminant source(s).

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 source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the 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.	2009-02-019

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."

Quaker Window Products Company
Osage County, S10, T41N, R9W

1. Emission Limitation
 - A. Quaker Window Products shall emit less than 15.0 tons of particulate matter less than ten (10) microns in aerodynamic diameter (PM₁₀) in any consecutive 12 month period from the automated Thermal Fill and Debridge process equipment, EP-31 and EP-32, respectively.
 - B. Quaker Window Products shall maintain an accurate record of PM₁₀ emitted into the atmosphere from EP-31 and EP-32. Attachment A or an equivalent form shall be used for this purpose. Quaker Window Products 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.
 - C. Quaker Window Products 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 the end of the month during which the records from Special Condition Number 1.B. indicate that the source exceeds the limitation of Special Condition Number 1.A.
2. Emission Limitation
 - A. Quaker Window Products shall emit less than 10.0 tons of ethylene glycol, CAS # 107-21-1, in any consecutive 12 month period from the entire installation. This limit applies to all equipment and processes installed or permitted as of the date of this permit.
 - B. Quaker Window Products shall maintain an accurate record of ethylene glycol, CAS # 107-21-1, emitted into the atmosphere from the entire installation. Attachment B or an equivalent form shall be used for this purpose. Quaker Window Products 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.

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SPECIAL CONDITIONS:

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

- C. Quaker Window Products 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 the end of the month during which the records from Special Condition Number 2.B. indicate that the source exceeds the limitation of Special Condition Number 2.A.
3. Emission Control
- A. Quaker Window Products shall control emissions from the Debridge Cutting System using a cyclone dust collector as specified in the construction permit application. The cyclone dust collector shall be operated and maintained in accordance with the manufacturer's specifications.
 - B. Visible emissions shall be used as an indicator of the proper operation of the equipment in 3.A. Quaker Window Products shall comply with the requirements of *Permit Condition EU0090-001* in operating permit OP2002-046.
4. Emission Confirmation
- A. Quaker Window Products shall record the Potential to Emit (PTE) for each emission source of the entire installation, and the corresponding emission limits, if any, for each respective emission source.
 - B. Quaker Window Products shall report to the Air Pollution Control Program's New Source Review and Operating Permit Units, P.O. Box 176, Jefferson City, MO 65102 no later than one hundred twenty (120) days after the issuance date of this permit the records from Special Condition 4.A.

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

Project Number: 2009-02-019
Installation ID Number: 151-0050
Permit Number:

Quaker Window Products
504 Highway 63 South
Freeburg, MO 65035

Complete: February 24, 2009

Parent Company:
Quaker Window Products
P.O. Box 128
Freeburg, MO 65305

Osage County, S10, T41N, R9W

REVIEW SUMMARY

- Quaker Window Products has applied for authority to replace the manually operated Thermal Fill and Debridge process equipment with automated equipment (respectively EP-31 and EP-32).
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment, but below the combined de minimis level. Ethylene glycol emissions have been limited to less than 10.0 tons per year. Methylene Diphenyl Diisocyanate (MDI) emissions are expected from the proposed equipment, but below the Screening Model Action Level (SMAL).
- None of the New Source Performance Standards (NSPS) apply to the proposed equipment.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) or currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment.
- Particulate matter less than ten (10) microns in aerodynamic diameter (PM₁₀) will be controlled by a cyclone dust collector.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM₁₀ are at minor source levels, but voluntarily limited to de minimis levels. Potential emissions of ethylene glycol are at major source levels, but voluntarily limited to de minimis levels.
- This installation is located in Osage County, an attainment area for all criteria air pollutants.

- This installation is not on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2].
- Ambient air quality modeling was not performed since emissions of the application are limited to de minimis levels.
- Emissions testing is not required for the equipment.
- Amendment to the 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

Quaker Window Products Company (QWPC) operates a window production facility in Osage County. The company has applied for and been issued a Part 70 Operating Permit OP2000-97. This installation was classified as a major source of VOC and HAP, with existing potential VOC emissions above 250 tons per year and potential HAP emissions above 25.0 tons per year. QWPC is no longer a major source of HAP as a 10.0 ton per year singular and 25.0 ton per year combined HAP limit was set in permit 0999-012A. This installation has received nine (9) previous construction permits and amendments from the Air Pollution Control Program, listed in Table 1.

Table 1: Construction Permits and Amendments Issued to 151-0050

Permit	Description
0888-003	New pyrolysis furnace
0894-003	Sources added without permits
0894-003A	Increase in paint usage
1197-022	New ventilation system and expansion of operations
0798-015	New painting process
0199-007	Increase in VOC emission limit
0999-012	New paint curing oven
052001-020	Cutting and flushing
0999-012A	Add installation wide HAP limit

QWPC received a letter of warning on March 3, 2009 for the replacement of manual operated Thermal Fill and Debridge process equipment with automated equipment (respectively EP-31 and EP-32), without a valid construction permit. Permit 052001-020 was issued on May 9, 2001 for this replacement, however QWPC did not install the equipment within two years of the date the permit was issued. The equipment was installed in 2007, then observed operational and in use on March 3, 2009 via site survey. QWPC is currently in compliance.

Based upon the information in the application for authority to construct, this project is a Section (5) review. Since this project is de minimis, whether or not the installation is major for criteria pollutants does not affect this review. Based upon permit 0999-012, this installation appears to be a minor source for criteria pollutants. However, due to a lack of clarity among permits 0798-015, 0199-007 and 0999-012, the New Source Review Unit of the Air Pollution Control Program is not confident in the classification of the installation, and is requesting Quaker Window Products to submit the PTE of every emission source at the entire installation.

PROJECT DESCRIPTION

QWPC proposes to replace the emission sources at the Thermal Fill/Flush and Debridge Cutting System processes. These processes were originally permitted under construction permit 0894-003, and are identified as emission points EP-04 and EP-05. The applicant proposes to replace EP-04 and EP-05 with automated systems, EP-31 Azon Fillameter and EP-32 Azon Bridgemill, respectively.

The Azon Fillameter consists of the application of a reactive resin and polymeric isocyanate to an aluminum frame and usage of a cleaning/flushing agent. The resin and polymeric isocyanate liquids quickly react in an exothermic process to form a rigid insulating polymer known as thermal fill. The maximum application rate is 19 gallons per hour. 4,4 diphenylmethane diisocyanate, Chemical Abstracts Service number (CAS #) 101-68-8 is present in the polymeric isocyanate. Ethylene glycol, CAS # 107-21-1 is present in the resin. CAS #'s 101-68-8 and 107-21-1 are both HAPs. Small amounts of the two part mixture remain on the Fillameter spray nozzle between applications. The flushing process is necessary to clean the spray nozzle.

The manually operated Thermal Fill/Flush equipment used methylene chloride, CAS # 75-09-2, a HAP, as the cleaning/flushing agent. This process was manually operated, where there was no control of the volume of HAP used or the amount emitted. The replacement machine has the ability to flush a programmed volume of solvent, AzoPurge. This new Azon Fillameter solvent is a VOC, but not a HAP. The maximum new solvent application rate is 60 fluid ounces per hour.

The Azon Bridgemill is a cutting process. Here, the aluminum frame is cut lengthwise as it is automatically fed to the spinning blade. The depth of the cut is fully through the aluminum, with a minimal amount of cured thermal fill removed. The maximum cutting rate is 13,140 feet per hour.

EMISSIONS/CONTROLS EVALUATION

The Azon Fillameter has a cleaning/flushing maximum hourly design rate (MHDR) of 4.27 pounds of solvent per hour. Since the solvent is 100% VOC, the PTE from the cleaning/flushing process is 18.68 tons per year (tpy) of VOC. Emissions from the resin and polymeric isocyanate liquids are calculated by MDI Emissions Estimate software,

version 4.0.1, available from the Center of Polyurethanes Industry of the American Chemistry Council. This software was used by the Air Pollution Control Program and QWPC, each calculating independently. The total MDI emissions were estimated by both parties at less than the SMAL of 0.1 ton per year.

The VOC concentration is 0.0166 and 0.317 pounds per gallon from the isocyanate and resin, respectively. Assuming the most conservative estimate of all available VOC as being emitted, the VOC emissions from the isocyanate and resin are 0.61 and 14.73 tons per year, respectively. Emissions of HAPs that are also VOCs are counted in the emissions potential for both HAPs and VOCs. Ethylene glycol (CAS # 107-21-1) is a HAP and VOC. Conservatively, if the HAP content of the resin is entirely from ethylene glycol, and all of the available HAP is emitted, the potential emission of ethylene glycol is 14.74 tons per year, limited to 10.0 tons per year. The potential VOC emission is the sum of 18.68 and 15.35 tons per year, from the flushing agent and ethylene glycol, respectively.

Azon, the manufacturer of the Fillameter and supplier of the isocyanate, resin, and solvent, claims the boiling point of the VOC components in the two part mixture is higher than the temperature of the exothermic reaction, and therefore the VOC will be bound in the cured thermal fill. VOC emissions from the curing process itself will be negligible.

The deburring process MHDR is 219 linear feet per minute. The width of the blade is one-eighth of one inch. The thickness of the aluminum is one-sixteenth of one inch. To insure the full thickness of the aluminum is cut, the total cut depth must be slightly deeper than just the thickness of the aluminum. Considering the aluminum as ninety percent of the cut depth, only the remaining ten percent of the cut depth is cured thermal fill. The total cut depth is 0.0694 inches. Fifty percent of the materials removed are considered suspended particulate matter. Fifty percent of this matter is considered PM₁₀. The immediate cutting area of the machine is enclosed in plexi-glass. The entire cutting machine is housed in small room, within the plant. Using a combined cyclone dust collector/baghouse system, having a capture efficiency and removal efficiency of ninety and ninety-eight percent, respectively, yields 15.96 tpy of PM₁₀ emitted. Table 2 provides an emissions summary for the installation.

Table 2: Emissions Summary (tons per year)

Pollutant/CAS	Regulatory De Minimis Levels	Existing Installation Potential Emissions	Existing Actual Emissions (2007 EIQ)	Potential Emissions of the Application	Conditioned Emissions of the Application	New Installation Potential Emissions
PM ₁₀	15.0	8.20	1.42	15.96	<15.0	23.20
SO _x	40.0	0.10	0.00	0.00	N/A	0.10
NO _x	40.0	3.60	1.12	0.00	N/A	3.60
VOC	40.0	174.4	40.90	34.03	N/A	208.43
CO	100.0	2.30	0.15	0.00	N/A	2.30
HAP	10.0/25.0	<10.0/25.0	0.00	15.35	N/A	<10.0/25.0
Ethylene Glycol/ 107-21-1	^a 10.0	N/A	N/A	14.74	N/A	<10.0
Formaldehyde/ 50-00-0	^a 2.0	<2.0	N/A	0.00	N/A	<2.0
Ethyl benzene/ 100-41-4	^a 10.0	<10.0	N/A	0.00	N/A	<10.0
Xylene/ 1330-20-7	^a 10.0	<10.0	N/A	0.00	N/A	<10.0
Toulene/ 108-88-3	^a 10.0	<10.0	N/A	0.00	N/A	<10.0
Methyl Isobutyl Ketone/ 108-10-1	^a 10.0	<10.0	N/A	0.00	N/A	<10.0

N/A = Not Applicable

^a SMAL

Existing Installation Potential Emissions are taken from permits 0999-012 and 0999-012A. Existing Actual Emissions are taken from the 2007 Emission Inventory Questionnaire (EIQ). Potential Emissions of the Application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

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 PM₁₀ are at minor source levels, but limited to the de minimis level. Potential emissions of ethylene glycol are at major source levels, but limited to the de minimis level.

APPLICABLE REQUIREMENTS

Quaker Window Products shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- Submission of Emission Data, Emission Fees and Process Information, 10 CSR 10-6.110

The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.

- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was not performed since emissions of the application are limited to de minimis levels.

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 23, 2009, received February 24, 2009, designating Quaker Window Products 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 Regional Office Site Survey, dated February 27, 2009.

Mr. Michael H. Knoll
Executive Vice President
Quaker Window Products
P.O. Box 128
Freeburg, MO 65035

RE: New Source Review Permit - Project Number: 2009-02-019

Dear Mr. Knoll:

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 David Little, at the Departments' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by telephone to (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 Regional Office
PAMS File: 2009-02-019

Permit Number: