

STATE OF MISSOURI

PERMIT TO CONSTRUCT



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: 112013-005

Project Number: 2013-06-053
Installation Number: 047-0129

Parent Company: Ply Gem Industries Inc.

Parent Company Address: 5020 Weston Parkway, Suite 400, Cary, NC 27513

Installation Name: Variform, Inc.

Installation Address: 303 West Major Road, Kearney, MO 64060

Location Information: Clay County, S53, T21N, R31W

Application for Authority to Construct was made for:
The installation of film rollers to apply polyester film to the installation's PVC siding product.
This review was conducted in accordance with Section (6) of 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.

NOV 8 2013

EFFECTIVE DATE

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of startup 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 startup 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(12)(A)10. "Conditions required by permitting authority."

Variform, Inc.
Clay County, S53, T21N, R31W

1. Control Device Requirement – Baghouses/Fabric Filters
 - A. Variform, Inc. shall control particulate emissions from the equipment listed in Table 1 using baghouses or fabric filters.

Table 1: Emission units required to operate baghouses or fabric filters

Emission Point	Description	Emission Point	Description
100-1BH1	Hopper #1	200-10FB	Extrusion Receiver #1
100-1BH2	Hopper #2	200-11FB	Extrusion Receiver #2
100-1BH3	Hopper #3	200-12FB	Extrusion Receiver #3
100-1BH4	Hopper #4	200-13FB	Extrusion Receiver #4
100-1BH5	Hopper #5	200-14FB	Extrusion Receiver #5
100-1BH6	Hopper #6	200-15FB	Extrusion Receiver #6
100-1BH7	Hopper #7	200-16FB	Extrusion Receiver #7
100-1BH8	Hopper #8	200-19FB	Extrusion Receiver #8
200-1BH	Silo #1	200-20FB	Extrusion Receiver #9
200-2BH	Silo #2	200-21FB	Extrusion Receiver #10
200-3BH	Silo #3	400-1BH	Pulverizing Unit
200-4BH	Silo #4	400-1FB	Central Vacuum System
200-5BH	Silo #5	200-17FB	Railroad Receiver #1
200-6BH	Silo #6	200-18FB	Railroad Receiver #2
200-8BH	Silo #8	400-1CYC	Grinder #1
100-7B	ASA Resin Scale	400-2CYC	Grinder #2
300-1F	10 PVC Extruders	400-3CYC	Grinder #3

- B. Control Device Requirements for Silo #8 (200-8BH)
 - 1) The baghouse shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. This gauge or meter shall be located such that the Department of Natural Resources' employees may easily observe them.

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SPECIAL CONDITIONS:

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

- 2) Variform, Inc. shall monitor and record the operating pressure drop across the baghouse at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
- C. Control Device Requirements for all emission units in Table 1, excluding Silo #8 (200-8BH)
 - 1) Variform, Inc. shall conduct visible emission checks on these control devices at least once every 24 hours. For control devices with visible emissions, the permittee shall conduct maintenance or replace the filter.
 - D. Replacement filters for the baghouses and fabric filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - E. Variform, Inc. shall maintain a copy of the manufacturer's performance specifications for each control device on site.
 - F. Variform, Inc. shall maintain an operating and maintenance log for the baghouses and fabric filters 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.
2. Record Keeping and Reporting Requirements
Variform, 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 MSDS for all materials used.

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

Project Number: 2013-06-053
Installation ID Number: 047-0129
Permit Number:

Variform, Inc.
303 West Major Road
Kearney, MO 64060

Complete: June 20, 2013

Parent Company:
Ply Gem Industries Inc.
5020 Weston Parkway, Suite 400
Cary, NC 27513

Clay County, S53, T21N, R31W

REVIEW SUMMARY

- Variform, Inc. has applied for authority to install film rollers to apply polyester film to the installation's PVC siding product.
- HAP emissions are expected from the proposed equipment. The polyester film will emit MIBK (108-10-1) and Formaldehyde (50-00-0).
- 40 CFR Part 60, Subpart DDD – *Standards of Performance for VOC Emissions from the Polymer Manufacturing Industry* is not applicable to the installation. The installation does not manufacture their polyester film, but instead purchases it for fabrication.
- 40 CFR Part 60, Subpart VVV – *Standards of Performance for Polymeric Coating of Supporting Substrates Facilities* is not applicable to the installation. The installation does not perform web coating and; therefore, does not meet the definition of *polymeric coating of supporting substrates* at §60.741.
- 40 CFR Part 61, Subpart V – *National Emission Standard for Vinyl Chloride* is not applicable to the installation. The installation does not produce their PVC resin, but instead purchases it for fabrication.
- 40 CFR Part 63, Subpart PPPP – *National Emission Standards for HAP for Surface Coating of Plastic Parts and Products* is not applicable to the installation. The polyethylene film is a solid, not a liquid plastic coating; therefore, the polyethylene film does not meet the definition of *coating* at §63.4581.
- 40 CFR Part 63, Subpart WWWW – *National Emissions Standards for HAP: Reinforced Plastic Composites Production* is not applicable to the installation. The installation does not use any materials containing styrene.

- 40 CFR Part 63, Subpart DDDDDD – *National Emission Standards for HAP for PVC and Copolymers Production Area Sources* is not applicable to the installation. The installation does not manufacture their PVC resin, but instead purchases it for fabrication.
- No air pollution control equipment is being used in association with the new equipment. Baghouses and fabric filters are required for the existing PVC fabrication process so that the installation can obtain a Basic Operating Permit.
- 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 Clay 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 for this review. No model is currently available which can accurately predict ambient ozone concentrations caused by this installation's VOC emissions.
- Emissions testing is not required for the equipment.
- A Basic Operating Permit application is required for this installation within 30 days of commencement of operations.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Variform, Inc. is an existing minor source in Clay County that produces PVC siding. PVC resin, calcium carbonate, micro-ingredients, and other additives are combined in a heated mixer. The blend is then stored in silos until needed.

The PVC resin blend is taken from the silos and conveyed to one of ten extrusion lines. The extrusion lines consist of pushing the PVC resin blend through a heated barrel and die by tooled screws. The heat melts the PVC resin and the screws knead and thoroughly mix the blend to facilitate fusion of the PVC resin with the calcium carbonate, micro-ingredients, and other additives. The extruders form the heated blend into the dimensions specified for the siding. After exiting the extruder the PVC siding goes through an embossment roller system before entering a water cooling tank where the PVC is thermally set.

The following New Source Review permits have been issued to Variform, Inc. from the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
1095-011	Installation of a facility to produce PVC siding
1095-011A	Modifications to the special conditions of 1095-011
0399-027	Upgrades to an existing extrusion line
112001-008	Installation of a storage silo and railcar loading system

PROJECT DESCRIPTION

The installation has requested to add a polyethylene film to their PVC siding product. The film will be added to the PVC siding product by film roller after PVC extrusion but prior to the embossment roller system.

The installation contains ten extruders with a throughput of 2,500 pounds of PVC siding per hour per extruder. Each square foot of PVC siding will receive one square foot of polyethylene film. One square foot of the PVC siding weighs 0.4 pounds, resulting in 62,500 square feet of PVC siding to be coated per hour. The polyethylene film has a density of 86.77 lb/ft³ and will be applied to achieve a thickness of 0.3 mm, resulting in a maximum polyethylene film throughput of 53,377.1 lb/hr for all ten extruders.

EMISSIONS/CONTROLS EVALUATION

The polyethylene film contains 0.1 percent HAP (0.08 percent MIBK and 0.02 percent formaldehyde) and 3.94 percent VOC. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Table 4.4-2 "Emission Factors for Uncontrolled Polyester Resin Product Fabrication Process" (February 2007) states that for continuous lamination processes only four to seven percent of the starting monomer is emitted. To be conservative, it was assumed seven percent is emitted.

To ensure that the installation was a minor source, potential emissions of the existing facility were calculated as part of this project. The existing installation is bottlenecked by the PVC extrusion rate to 25,000 lb/hr. An installation-wide equipment list is available in Table 3.

Table 3: Installation-wide Equipment List

Emission Unit	Description	Project Status
100-1BH1	Hopper #1	Existing
100-1BH2	Hopper #2	Existing
100-1BH3	Hopper #3	Existing
100-1BH4	Hopper #4	Existing
100-1BH5	Hopper #5	Existing
100-1BH6	Hopper #6	Existing
100-1BH7	Hopper #7	Existing
100-1BH8	Hopper #8	Existing
100-7FB	ASA Resin Scale	Existing
200-10FB	Extrusion Receiver #1	Existing
200-11FB	Extrusion Receiver #2	Existing
200-12FB	Extrusion Receiver #3	Existing
200-13FB	Extrusion Receiver #4	Existing
200-14FB	Extrusion Receiver #5	Existing
200-15FB	Extrusion Receiver #6	Existing
200-16FB	Extrusion Receiver #7	Existing
200-19FB	Extrusion Receiver #8	Existing
200-20FB	Extrusion Receiver #9	Existing
200-21FB	Extrusion Receiver #10	Existing
200-17FB	Railroad Receiver #1	Existing
200-18FB	Railroad Receiver #2	Existing
200-1BH	Silo #1	Existing
200-2BH	Silo #2	Existing
200-3BH	Silo #3	Existing
200-4BH	Silo #4	Existing
200-5BH	Silo #5	Existing
200-6BH	Silo #6	Existing
200-8BH	Silo #8	Existing
300-1F	10 PVC Extruders	Existing
300-2F	Polyester Film Rollers	New
400-1BH	Pulverizing Unit	Existing
400-1CYC	Grinder #1	Existing
400-2CYC	Grinder #2	Existing
400-3CYC	Grinder #3	Existing
400-1FB	Central Vacuum System	Existing
400-1FUG	Ink	Existing
400-2FUG	Make-up Solvent	Existing
500-1NG	(3) Air Make-up Units, 0.02 MMBtu/hr each	Existing
500-2NG	(2) Air Make-up Units, 0.007 MMBtu/hr each	Existing
500-3NG	Space Heating, (2) 0.216 MMBtu/hr, (2) 0.2 MMBtu/hr, 0.15 MMBtu/hr, (2) 0.13 MMBtu/hr, (3) 0.125 MMBtu/hr, 0.1 MMBtu/hr, 0.06 MMBtu/hr	Existing
500-4NG	Primary Plant Air Make-up Unit, 2.52 MMBtu/hr	Existing
500-5NG	Shipping Bay Air Make-up Unit, 0.5 MMBtu/hr	Existing

Emission factors for PVC fabrication were obtained from a Michigan Department of Environmental Quality emission calculation fact sheet, *Plastic Production and Products Manufacturing*, fact sheet #9847 (November 2005) available at: http://michigan.gov/documents/deq/deq-aqd-air-eval-era-EmissionCalculation-plasticproducts_324073_7.pdf

It was unclear which controls were federally enforceable under Construction Permit 1095-011 as a full copy of the permit application was unavailable; therefore, existing controls are required by this permit. The installation was given 99 percent particulate control for operation of a baghouse or fabric filter.

Emissions from the combustion of natural gas were calculated using emission factors obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4 “Natural Gas Combustion” (July 1998).

The following table provides an emissions summary for this project. Existing actual emissions were taken from the installation’s 2012 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8,760 hours per year).

Table 4: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Conditioned Potential Emissions	Existing Actual Emissions (2012 EIQ)	Potential Emissions of the Application	New Installation Potential
PM	25.0	77.04	N/A	N/A	77.04
PM ₁₀	15.0	77.04	0.01	N/A	77.04
PM _{2.5}	10.0	0.21	0.01	N/A	0.21
SO _x	40.0	1.38	1.5	N/A	1.38
NO _x	40.0	2.13	-	N/A	2.13
VOC	40.0	17.36	3.88	64.48	81.84
CO	100.0	1.79	N/A	N/A	1.79
GHG (CO ₂ e)	100,000	2,556.63	N/A	N/A	2,556.63
HAP	25.0	1.65	-	1.64	3.29
Methanol	10.0	1.61	-	N/A	1.61
MIBK	10.0 ¹	N/A	N/A	1.31	1.31
Formaldehyde	10.0 ²	N/A	N/A	0.33	0.33
Hexane	10.0	0.04	-	N/A	0.04

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

¹The SMAL for MIBK is 10.0 tpy, project emissions are only 1.31 tpy; therefore, no MIBK modeling was performed.

²The SMAL for formaldehyde is 2.0 tpy, project emission are only 0.33 tpy; therefore, no formaldehyde modeling was performed.

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, but below major source levels.

APPLICABLE REQUIREMENTS

Variform, 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.

GENERAL REQUIREMENTS

- 10 CSR 10-6.065 *Operating Permits*
 - The permittee is required to obtain a Basic Operating Permit within 30 days of commencement of operations
- 10 CSR 10-6.110 *Submission of Emission Data, Emission Fees and Process Information*
- 10 CSR 10-6.165 *Restriction of Emission of Odors*
- 10 CSR 10-6.170 *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*
- 10 CSR 10-6.220 *Restriction of Emission of Visible Air Contaminants*

SPECIFIC REQUIREMENTS

- 10 CSR 10-6.260 *Restriction of Emission of Sulfur Compounds*
 - The permittee shall not cause or permit the emission into the atmosphere of gases containing more than 500 ppmv SO₂ or 35 mg/m³ of sulfuric acid or sulfur trioxide or any combination of those gases averaged on any consecutive three-hour period from 300-1F 10 PVC Extruders.

STAFF RECOMMENDATION

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

Alana L. Rugen, EIT
New Source Review Unit

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated June 12, 2013, received June 20, 2013, designating Ply Gem Industries Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Michigan Department of Environmental Quality emission calculation fact sheet, *Plastic Production and Products Manufacturing*, fact sheet #9847 (November 2005) available at: http://michigan.gov/documents/deq/deq-aqd-air-eval-era-EmissionCalculation-plasticproducts_324073_7.pdf

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SIC	Standard Industrial Classification
GHG	Greenhouse Gas	SIP	State Implementation Plan
gpm	gallons per minute	SMAL	Screening Model Action Levels
gr	grains	SO_x	sulfur oxides
GWP	Global Warming Potential	SO₂	sulfur dioxide
HAP	Hazardous Air Pollutant	tph	tons per hour
hr	hour	tpy	tons per year
hp	horsepower	VMT	vehicle miles traveled
lb	pound	VOC	Volatile Organic Compound
lbs/hr	pounds per hour		
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. Mike Murphy
HR/EHS Manager
Variform, Inc.
303 West Major Road
Kearney, MO 64060

RE: New Source Review Permit - Project Number: 2013-06-053

Dear Mr. Murphy:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. 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 submittal of a basic 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 Alana Rugen, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102, or by telephone at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:ark

Enclosures

c: Kansas City Regional Office
PAMS File: 2013-06-053

Permit Number: