

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: **11 2 0 1 6 - 0 0 3**

Project Number: 2016-08-028

Installation Number: 095-0298

Parent Company: Clarcor Inc.

Parent Company Address: 840 Crescent Centre Dr Suite 600, Franklin, TN 37067

Installation Name: CLARCOR Industrial Air

Installation Address: 417 SE Thompson, Lee's Summit, MO 64082

Location Information: Jackson County, S17, T47N, R31W

Application for Authority to Construct was made for:

One forspinning unit for nanofiber manufacturing. 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.



Prepared by
David Little, PE
Environmental Engineer III
New Source Review Unit



Director or Designee
Department of Natural Resources

NOV 03 2016

Effective Date

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 Enforcement and Compliance Section of 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 Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's 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 the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's 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 using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

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."

CLARCOR Industrial Air
Jackson County, S17, T47N, R31W

1. HAP Emission Limitation
 - A. CLARCOR Industrial Air shall not emit more than 1.0 ton of dimethylformamide (DMF) in any consecutive 12-month period from the forcespinning unit (EP-04).
 - B. CLARCOR Industrial Air shall develop and use forms to demonstrate compliance with Special Condition 1.A. The forms shall contain at a minimum the following information,
 - 1) Installation name
 - 2) Installation ID
 - 3) Permit number
 - 4) Current month
 - 5) Current 12-month date range
 - 6) Monthly usage of each respective material containing DMF at EP-04 (gallons), and the material name
 - 7) Density of each respective material containing DMF used at EP-04 (lb/gal)
 - 8) Maximum weight % of DMF in each respective material used
 - 9) Monthly DMF emissions of each respective material calculated using the following equation:

$$\begin{aligned} & \text{DMF emissions (tons)} \\ & = \text{Material containing DMF (gallons used)} \\ & \times \text{Density } \left(\frac{\text{lbs}}{\text{gal}} \right) \\ & \times \text{Maximum Wt \% DMF} \\ & \times \left(\frac{1 \text{ ton DMF}}{2000 \text{ lbs DMF}} \right) \end{aligned}$$
 - 10) Monthly emissions of DMF calculated by summing the results of 1.B.9) for each respective material containing DMF at EP-04.
 - 11) 12-month rolling total DMF emissions from EP-04 and the sum of DMF emissions from startup, shutdown, and malfunction as reported the Air Pollution Control Program's Compliance/Enforcement Section

SPECIAL CONDITIONS:

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

- 12) Indication of compliance with Special Condition 1.A.
2. **Operational Requirement – Closed Containers**
CLARCOR Industrial Air shall keep all VOC containing materials in closed containers whenever the materials are not in use. CLARCOR Industrial Air shall provide and maintain suitable, easily read, permanent markings on all VOC material containers used with EP-04.
3. **Record Keeping and Reporting Requirements**
 - A. CLARCOR Industrial Air 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 SDS for all materials used.
 - B. CLARCOR Industrial Air shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 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.

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

Project Number: 2016-08-028
Installation ID Number: 095-0298
Permit Number: 11 2 0 1 6 - 0 0 3

Installation Address:
CLARCOR Industrial Air
417 SE Thompson
Lee's Summit, MO 64082

Parent Company:
Clarcor Inc.
840 Crescent Centre Dr Suite 600
Franklin, TN 37067

Jackson County, S17, T47N, R31W

REVIEW SUMMARY

- CLARCOR Industrial Air has applied for authority to install one forcespinning unit for manufacturing nanofibers.
- The application was deemed complete on September 9, 2016.
- HAP emissions are expected from the proposed equipment. HAPs include DMF, formaldehyde, acrolein, acetaldehyde, propionaldehyde.
- NSPS 40 CFR 60 Subpart VVV, *Standards of Performance for Polymeric Coating of Supporting Substrates Facilities*, applies to the forcespinning unit (EP-04). EP-04 is a different NSPS *facility* than those in previous construction permits. The EP-04 potential VOC usage is less than 95 megagrams per 12-month period. Therefore only §§60.744(b), 60.747(b), and 60.747(c) apply to EP-04.
- None of the NESHAPs under 40 CFR 61 apply to the project emission units.
- None of the MACTs under 40 CFR 63 apply to the project emission units. The installation is a minor HAP source, therefore Subpart JJJJ *National Emission Standard for Hazardous Air Pollutants: Paper and Other Web Coating* and Subpart OOOO *National Emission Standards for Hazardous Air Pollutants: Printing, Coating, and Dyeing of Fabrics and Other Textiles* do not apply.
- No air pollution control equipment is being used in association with the project emission units.
- 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. Unconditioned potential emissions of DMF exceeded the exemption in 10 CSR 10-6.061(3)(A)3.B.

- This installation is located in Jackson County, a maintenance area for ozone and an attainment area for all other criteria pollutants, except SO₂. The installation is not located in the Jackson County SO₂ nonattainment area.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels and SMALs.
- Emissions testing is not required for the project emission units as a part of this permit.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

The existing installation manufactures expanded polytetrafluoroethylene (ePTFE) for use in a number of products including filters and the health care industry. The installation is a minor source of VOC for NSR permits and a major source of VOC for operating permits. According to issued construction permits, the installation wide VOC PTE is over 100 tpy. Operating permit type was changed from a Part 70 to a basic, however no new emission limits were included. Therefore the VOC PTE still exceeds 100 tpy. It has been requested that the installation provide PTE calculations to the Air Pollution Control Program operating permit unit in order to verify the operating permit type. The following NSR permits have been issued to CLARCOR Industrial Air.

Table 1: NSR Permit History

Permit Number	Description
012004-009	ePTFE manufacturing
102014-003	Coating line, cure oven, thermal oxidizer

PROJECT DESCRIPTION

The installation proposes to install a FS1100 forcespinning machine. Polymers, solvents, and fabric roll are received from offsite. Polymers and solvents will be fed into the machine to form a solution. Two spinnerets will extrude the solution using centrifugal force. The extruded solution will form nanofibers that will be collected on a 30 inch wide nonwoven fabric and air dried in a controlled environment. Air will be pulled through the coated substrate. There is no drying oven. There will be a negligible emissions increase associated with the increase in cutting and packaging the coated media. The coated media will be shipped offsite.

The machine can also be operated without solvents, using heat to melt polymers. The forcespinning solution MHDR will be 24 mL/min. The fabric will travel 6 to 60 feet per minute. Two hours of downtime are required per 24 hour day for cleaning. The forcespinning machine will not be equipped with a VOC control device. Filterable PM emissions will be inherently controlled by the fabric/substrate.

Six recipes are proposed, two of which require no solvent. Any recipe change that wasn't evaluated in this project is a change in the method of operation and is subject to construction permit applicability.

EMISSIONS/CONTROLS EVALUATION

Potential VOC and volatile HAP emissions from the four solutions were calculated using the recipes and SDS provided in the permit application. All volatiles were considered emitted. One of the solvent recipes contains DMF. Unconditioned DMF emissions are 3.52 tpy. A controlled PM emission factor of 0.0001 lb/lb of solution was provided by the applicant. This equates to 99.99% control which is in the range of a HEPA filter. Conservatively 99.5% control was chosen which equates to a controlled emission factor of 0.005 lb/lb.

Potential VOC and HAP emissions from the two melted polymer recipes were calculated using the document, *Development of Emission Factors for Polypropylene Processing*, Journal of Air and Waste Management Association, January 1999, Table 5, assuming controlled rheology homopolymer and 400 degrees F. The controlled PM emission factor of 0.005 lb/lb was used.

Each recipe was evaluated at its full potential annual usage to create a hybrid worst-case PTE. Potential PM emissions may be highest from one solution, while VOC emissions are highest from another. Different recipes cannot be used simultaneously.

Cleanup will occur with the same solvent used during production. Approximately 0.75 fluid ounce of solvent will be used for cleaning, per 8 hour shift. All volatiles were considered emitted.

Due to the low material throughput, short haul road distance, and being paved, haul road emissions were considered negligible.

The following table provides an emissions summary for this project. Existing potential emissions were obtained from permit 102014-003. Existing actual emissions were obtained from the installation's 2015 EIQ. Potential emissions of the project represent the potential of the EP-04, assuming 22 hours per day production, 2 hours per day cleanup, and 365 days per year. Potential DMF emissions are conditioned to not exceed the SMAL. Other pollutants were not proportionately reduced, except combined HAPs.

Table 2: Emissions Summary (tpy)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Project
PM	25.0	N/D	N/D	0.04
PM ₁₀	15.0	0.60	0.27	0.04
PM _{2.5}	10.0	N/D	0.27	0.04
SO ₂	40.0	0.04	0.02	N/A
NO _x	40.0	7.27	3.61	N/A
VOC	40.0	155.2	32.38	11.66
CO	100.0	6.10	3.03	N/A
GHG (CO ₂ e)	75,000	<<75,000	N/D	N/A
GHG (mass)	0	N/D	N/D	N/A
Combined HAPs	25.0	0.14	N/D	1
DMF	¹ 1	N/D	N/D	< 1
Formaldehyde	¹ 2	N/D	N/D	1.2E-05
Acrolein	¹ 0.04	N/D	N/D	1.7E-07
Acetaldehyde	¹ 9	N/D	N/D	7.7E-06
Propionaldehyde	¹ 5	N/D	N/D	8.4E-07

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

1 = 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. Unconditioned potential emissions of DMF exceeded the exemption in 10 CSR 10-6.061(3)(A)3.B.

APPLICABLE REQUIREMENTS

CLARCOR Industrial Air 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

- *Operating Permits*, 10 CSR 10-6.065
- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050
- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.
- *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

- *New Source Performance Regulations*, 10 CSR 10-6.070
 - –*Standards of Performance for Polymeric Coating of Supporting Substrates Facilities*, 40 CFR Part 60, Subpart VVV

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*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 5, 2016, received August 6, 2016, designating Clarcor, Inc. as the owner and operator of the installation.
- *Process Description for Air Permit 26AUG2016 Hatfield*, received August 29, 2016.

- *Process Description for Air Permit Rev 1 01SEP2016 Hatfield*, received September 9, 2016.
- Emails between Denise Gordon and David Little, August 6, 2016 to October 4, 2016.

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
EIQ	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	SDS	Safety Data Sheet
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

www.dnr.mo.gov

NOV 03 2016

Ms. Kathy French
EHS Leader
CLARCOR Industrial Air
417 SE Thompson
Lee's Summit, MO 64082

RE: New Source Review Permit - Project Number: 2016-08-028

Dear Ms. French:

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 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.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty 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 administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West

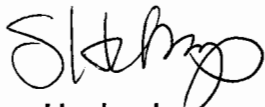
Ms. Kathy French
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High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.aa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact David Little, at the Department of Natural Resources' 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



Susan Heckenkamp
New Source Review Unit Chief

SH:dj

Enclosures

c: Kansas City Regional Office
PAMS File: 2016-08-028

Permit Number: 11 2 0 1 6 - 0 0 3