



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:

042013-009

Project Number: 2011-09-050

Installation Number: 510-2842

Parent Company: Chemline, Inc.

Parent Company Address: 5151 Natural Bridge Road, St. Louis, MO 63115

Installation Name: Chemline, Inc.

Installation Address: 5151 Natural Bridge Road, St. Louis, MO 63115

Application for Authority to Construct was made for:

The permitting of an existing polyurethane coatings research and manufacturing facility. The facility was constructed without the receipt of a permit from the St. Louis City Health Department. Obtaining this permit is part of a remedial action required by the Missouri Air Pollution Control Program. 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.

APR 22 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 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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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."

Chemline Inc.
5151 Natural Bridge Road
St. Louis, MO 63115

1. **Operational Requirement**
Chemline, Inc. shall keep all chemicals in sealed containers whenever the materials are not in use. Chemline Inc. shall provide and maintain suitable, easily read, permanent markings on all chemical containers used with this equipment.
2. **Emissions Limits**
 - A. Chemline, Inc. shall emit less than 100.0 tons of volatile organic compounds (VOCs) in any consecutive 12-month period from the entire installation. The equipment at the installation is listed in Table 1 of the "Review for Application for Authority to Construct and Operate" section of this permit.
 - B. Chemline, Inc. shall emit less than 25.0 tons combined hazardous air pollutants (HAPs) and 10.0 tons of individual HAP in any consecutive 12-month period from the entire installation. If an individual HAP has a Screening Model Action Level (SMAL) less than 10.0 tons per year, individual HAP emissions at the installation shall be limited to less than the SMAL. A current listing of the SMAL values can be found online at <http://dnr.mo.gov/env/apcp/docs/cp-hapraltbl6.pdf>.
 - C. Attachments A, B and C, or equivalent forms, such as electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 1.A. and 1.B.
3. **Control Device Requirement for the Spray Guns and Steel Shot Blasting Gun**
 - A. Chemline, Inc. shall control particulate emissions from the coatings spray gun (SB) using a booth equipped with filters as specified in the permit application.

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SPECIAL CONDITIONS:

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

- B. Chemline, Inc. shall control particulate emissions from the steel shot blasting gun (BC1) using a cabinet equipped with a filter as specified in the permit application.
 - C. The coatings booths, the blasting cabinet and the filters shall be operated and maintained in accordance with the manufacturer's specifications.
 - D. Replacement 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. Chemline, Inc. shall maintain an operating and maintenance log for the filters which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions.
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
4. Control Device Requirement – Dust Collectors
- A. Chemline, Inc. shall control emissions from the following equipment using dust collectors as specified in the permit application.
 - 1) 60 Horsepower (hp) Mixer (M6)
 - 2) Sweep Blade Mixer (M7)
 - 3) 100 hp Mixer (M12)
 - B. The dust collectors shall be operated and maintained in accordance with the manufacturer's specifications. The dust collectors 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 dust collectors 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. Chemline, Inc. shall monitor and record the operating pressure drop across the dust collector at least once every 24 hours of operations. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

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SPECIAL CONDITIONS:

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

- E. Chemline, Inc. shall maintain an operating and maintenance log for the dust collector 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.

- 5. Use of Alternative Chemicals
When using an alternative HAP-containing material that is different than a material listed in the Application for Authority to Construct, Chemline, Inc. shall keep records of all new materials used and include the VOC and HAP emissions from these materials in the limitations (i.e. 100 tpy VOC limit, 25.0/10.0/SMAL tpy HAP limit) and associated record keeping in Special Conditions 2.A., 2.B., and 2.C.

- 6. Operational Restrictions
The spray booth (SB) and the blasting cabinet (BC1) shall only be used for research and quality control.

- 7. Record Keeping Requirements
Chemline, Inc. shall maintain all records required by this permit for not less than five years and shall make them available to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for all materials used.

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

Project Number: 2011-09-050
Installation ID Number: 510-2842
Permit Number:

Chemline, Inc.
5151 Natural Bridge Road
St. Louis, MO 63115

Complete: August 31, 2009

Parent Company:
Chemline, Inc.
5151 Natural Bridge Road
St. Louis, MO 63115

REVIEW SUMMARY

- Chemline, Inc. has applied to permit an existing polyurethane coatings research and manufacturing facility.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from this process are 4,4-methylenediphenyl diisocyanate (MDI), toluene diisocyanate (TDI), chromium III, and xylene.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- Subpart CCCCCC, *National Emission Standards for Hazardous Air Pollutants for Area Sources: Paint and Allied Products Manufacturing*, of the Maximum Achievable Control Technology (MACT) regulations applies to the installation.
- Subpart HHHHH, *National Emission Standards for Hazardous Air Pollutants: Miscellaneous Coating Manufacturing*, of the MACT regulations does not apply to this installation because it is not major for HAPs.
- Subpart III, *National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production*, and Subpart MMMMM, *National Emission Standards for Hazardous Air Pollutants: Flexible Polyurethane Foam Fabrication Operations*, of the MACT regulations do not apply to this installation because this installation does not produce or fabricate flexible polyurethane foam.
- Subpart HHHHHH, *National Emissions Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources*, of the MACT regulations does not apply to this installation because the spray application of coatings performed at this facility is only for research and quality control, which are specifically exempted from this subpart.
- Subpart OOOOOO, *National Emission Standards for Hazardous Air Pollutants for Flexible Polyurethane Foam Production and Fabrication Area Sources*, of the MACT

regulations does not apply to this installation because it does not produce or fabricate flexible polyurethane foam.

- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation.
- A spray booth with fabric filters is being used to control particulate emissions from the spray gun. A cabinet with fabric filters is being used to control particulate emissions from the shot blasting gun. Dust collectors are used to control particulate emissions from the 60 horsepower (hp) mixer (M6), the sweep blade mixer (M7) and the 100 hp mixer (M12).
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Conditioned potential emissions of all pollutants are below their respective *de minimis* level.
- This installation is located in St. Louis County, a nonattainment area for particulate matter less than two-and-a-half microns in diameter (PM_{2.5}) and ozone and an attainment area for all other criteria pollutants. This installation is also on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2, Category 20, *Chemical Process Plants*. Therefore, the installation's major source level is 100 tons per year and fugitive emissions are 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 volatile organic compound (VOC) emissions.
- Emissions testing is not required for the equipment.
- The installation is required to submit either an Intermediate Operating Permit application for this installation within 90 days of equipment startup or a Part 70 Operating Permit application for this installation within 184 days of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION/PROJECT DESCRIPTION

Chemline, Inc. is a research and manufacturing facility for two (2) part polyurethane coatings. The installation purchases raw material of MDI, polyols and other ingredients as specified by the customers, blends the material and packages them for shipping. All products are sold as two (2) part coatings. The facility produces four main lines of products: piping/tank coatings, hard coatings, roof coatings and flooring products. The maximum production rate of the plant is 7,000 gallons per day.

The facility installed all of its current equipment in either 2004 or 2010. However, no construction permit was ever issued for the equipment. Obtaining this permit is part of a remedial action required by the Missouri Air Pollution Control Program. All of the equipment currently at the site is included in this permit and they are listed below.

Table 1: Current Equipment List

Emission Unit Numbers	Description
BC1	Blast Cabinet with Dust Collector (DC1)
M1	30 horsepower (hp) mixer
M2	30 hp mixer
M3	15 hp tilt back mixer
M4	2 hp mixer
M5	2 hp mixer
M6	60 hp mixer
M7	Sweep blade mixer
M8	7.5 hp mixer
M10	7.5 hp mixer
M11	2 hp lab mixer
M12	100 hp mixer
M13	T-1, 10 hp mixer (idle foam tank)
M14	T-2, 10 hp mixer (idle mix tank)
PA	1.5 hp thixotropic mixer/press
PB	5 hp thixotropic mixer/press
R1	10 hp mixer
R2	5 hp mixer
R3	500 gallon reaction, 5 hp
SS	40 hp sand mill
SN	30 hp sand mill
SB	Coatings Spray Booth

In the past, equipment was cleaned with a mixture of toluene and xylene. However, in 2011, the facility switched to the use of Aromatic 150, which has no toluene or xylene.

EMISSIONS/CONTROLS EVALUATION

VOC and HAP emissions are expected from the chemical mixing process and the coatings spray booth. Particulate emissions, which include particulate matter less than two-and-a half microns in diameter (PM_{2.5}), particulate matter less than ten microns in diameter (PM₁₀) and particulate matter (PM), are expected from powder mixing, the coatings spray booth, and the shot blasting cabinet.

Potential VOC emissions and HAP emissions, with the exception of MDI, were not calculated for this review. The facility produces many formulations and it is difficult to determine accurately the potential VOC and HAP emissions. Instead, to ensure that the facility is a minor source for construction permits, the installation is limited in this permit to 100.0 tons of VOC, 25.0 tons combined HAPs, and 10 tons of individual HAP in any consecutive 12-month period. Some individual HAP may have Screening Model Action Levels (SMAL) lower than 10.0 tons per year. In those instances, the individual HAP shall be limited to less than the SMAL. A current listing of the SMAL values can be found online at <http://dnr.mo.gov/env/apcp/docs/cp-hapraltbl6.pdf>.

Research performed by the EPA indicates that due to its low vapor pressure, emissions of MDI are expected to be minimal. The MDI emissions were calculated using the MDI Emissions Estimator software from the American Chemistry Council Center for the Polyurethanes Industry, which uses equations from the document "MDI/Polymeric MDI Emissions Reporting Guidelines for the Polyurethane Industry."

Particulate emissions from the spray gun and the shot blasting gun are controlled by booth/cabinet with fabric filters. PM emissions from the spray booth were calculated through mass balances assuming a transfer efficiency of 50%, a device capture efficiency of 70% and a filter efficiency of 90%. The transfer efficiency is taken from Table 5-7, *Transfer Efficiencies For Different Spraying Methods and Surface Types*, in the Air Pollution Training Institute (APTI) course 482 manual. A device capture efficiency of 70% was used based on engineering judgment taking into account the design of the paint booth. The booth is a three-sided enclosure with emissions being drawn through a filter bank on the back side. The filter efficiency of 95% is a conservative value used by the Air Pollution Control Program for paint booth filters. For the blasting cabinet, PM emissions were calculated using a controlled emission factor in EPA document AP-42, *Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition, Chapter 13.2.6, *Abrasive Blasting* (10/97). PM emissions were converted to PM_{2.5} and PM₁₀ by using particle size distribution determined by the California Emissions Inventory and Reporting System (CEIDARS). The emission factor for the blasting cabinet already takes into account the control device so no additional control efficiency was used.

The spray booth and the blasting cabinet are only used sparingly for research and quality control. It does not participate in the manufacturing process. It is estimated that the spray booth is used daily or every other day but only for a few minutes at a time. The potential amount of coatings used by the spray booth (6,833 lbs/yr) was calculated by using historical usage and scaling it up to 8760 hours. The blast cabinet prepares panels for coating by the spray booth and is used roughly once every two weeks for a maximum of 20 minutes each time for a total of 520 minutes of operation. It takes approximately one minute to coat each panel and one pound of steel shot per panel. The maximum usage for the steel shot is then 520 pounds per year for 2600 hours of plant operations. This was scaled up to a maximum usage of 1752 lbs/yr for 8,760 hours of operations.

PM and PM₁₀ emissions from powder mixing were calculated using emission factors from the EPA Factor Information Retrieval (FIRE) software for pigment handling (SCC 30101402). There are no particle size distributions available so all of the PM₁₀ were considered PM_{2.5}. Each blending vessel has a small opening on top with a hinged lid. Once the material is added, the lid is closed and the mixing occurs under total enclosure. A dust collector is used to control particulate emissions from the blending vessels. It is expected that some particulate emissions will not be captured during material addition. A conservative capture efficiency of 70% was used in the calculations. A default efficiency of 99% was used for the dust collector. Emissions from blending were calculated using the actual usage rate in 2011, scaled up to 8,760 hours per year, so a 20% safety factor was added onto the calculations.

The following table provides an emissions summary for this project.

Table 2: Emissions Summary (tons per year)

*Pollutant	Regulatory <i>De Minimis</i> Levels/SMAL	Existing Potential Emissions	Existing Actual Emissions (2011 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM _{2.5}	10.0	N/D	N/D	1.14	N/A
PM ₁₀	15.0	N/D	N/D	1.14	N/A
PM	25.0	N/D	N/D	1.32	N/A
SO _x	40.0	N/D	0.0	0.0	N/A
NO _x	40.0	N/D	0.0	0.0	N/A
VOC	40.0	N/D	4.32	N/D	<100.0
CO	100.0	N/D	0.0	0.0	N/A
HAPs	10.0/25.0	N/D	0.59	N/D	<SMAL/10.0/25.0
MDI	0.1	N/D	N/D	0.0026	N/A

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

*Not all individual HAPs are listed in the table due to the large number used by the facility. For a complete listing, please see the calculation spreadsheet.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. The installation's potential emissions of VOC are conditioned below the major source level.

APPLICABLE REQUIREMENTS

Chemline, 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

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

- *Maximum Achievable Control Technology (MACT) Regulations, 10 CSR 10-6.075, National Emission Standards for Hazardous Air Pollutants for Area Sources: Paint and Allied Products Manufacturing, 40 CFR Part 63, Subpart CCCCCC*

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.

Chia-Wei Young
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The construction permit application submitted to the St. Louis Department of Health on September 3, 2009, received by the Missouri Air Pollution Control Program on September 22, 2011, designating Chemline, Inc. as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- U.S. EPA Emission Inventory Improvement Program (EIIP) Technical Report Series, Volume 2: Point Sources. (2/05)

Mr. Kevin McCullough
VP of Operations
Chemline, Inc.
5151 Natural Bridge Road
St. Louis, MO 63115

RE: New Source Review Permit - Project Number: 2011-09-050

Dear Mr. McCullough:

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 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 Chia-Wei Young 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

Susan Heckenkamp
New Source Review Unit Chief

SH:cyl

Enclosures

c: St. Louis Regional Office
PAMS File: 2011-09-050

Permit Number: