



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-1442C
Plant ID No.: 011-00033
Applicant: Magnetech Industrial Services, Inc. (Magnetech)
Facility Name: Huntington
Location: 501 8th Avenue West, Huntington, Cabell County
NAICS Code: 811310
Application Type: Class II Administrative Update
Received Date: April 25, 2016
Engineer Assigned: Thornton E. Martin Jr.
Fee Amount: \$300.00
Date Received: April 27, 2016
Complete Date: June 06, 2016
Applicant Ad Date: May 04, 2016
Newspaper: *The Herald Dispatch*
UTM's: Easting: 372.357 km Northing: 4,252.347 km Zone: 17
Description: The Applicant proposes to increase the VOC emissions for the Vacuum Pressure Impregnation System (8E, VPI Process Coating), VOC emissions for the Varnish Dip Tank (9E, utilizing a new resin Permafil 74041) and VOC emissions from Solvent use. In addition, new paints will be introduced to the spray paint booth (6E) increasing PM and HAP emissions.

PERMITTING HISTORY

- 3/13/92 - Permit R13-1442 was issued. Application contained specific information on the paint spray booth only, i.e., the ovens were just listed.

- 10/22/12 - Permit R13-1442A was issued. The facility was relocated to its current location (501 8th Avenue) from 1029 7th Avenue, Huntington. As part of the relocation permit, it was agreed upon (between the company and DAQ) that Gene Coccari would help Magnetech put together a complete new application to incorporate the six (6) ovens, one (1) VPI coater, one (1) varnish dip tank and two(2) abrasive blast cabinets which were omitted from permit application R13-1442A.

- 06/17/13 - Class II Administrative Update R13-1442B submitted to incorporate six (6) ovens, one (1) VPI coater, one (1) varnish dip tank and two (2) abrasive blast cabinets into the permit for the first time. The increase in potential emissions was estimated to be: PM = +2.5 TPY; SO₂ = +2.0 TPY; NO_x = 2.7 TPY; CO = 1.1 TPY, PM₁₀ = 1.25 TPY; and Total HAPs = 2 TPY.
- 04/25/16 - Class II Administrative Update R13-1442C submitted to increase the VOC emissions for the Vacuum Pressure Impregnation System (8E, VPI Process Coating), VOC emissions for the Varnish Dip Tank (9E, utilizing a new resin Permafil 74041) and VOC emissions from Solvent use. In addition, new paints will be introduced to the spray paint booth (6E) increasing PM and HAP emissions.

DESCRIPTION OF PROCESS

Applications R13-1442C and R13-1442B were utilized in developing a comprehensive overview of the facility operations:

Magnetech repairs (reconditions and/or rewinds) electric motors for utilities and industrial customers. It is the exclusive maintenance and repair shop for CSX and also does work for all of the major railroad companies across the U.S.

Flow of Repairs

There are two types of repair in Magnetech's operations: Reconditions and Rewinds. Below are descriptions of each type:

RECONDITIONS

- Unit received for repair
- Unit dismantled and inspected
- Components steam cleaned
- Components baked dry in oven (4S, 5S or 7S)
- Component dipped in dip tank (if required) (9S)
- Dipped components baked in oven (4S, 5S or 7S)
- Small parts glass bead cleaned in abrasive cabinet (10S or 11S)
- Unit re-assembled and tested
- Unit painted (6S)

REWINDS

- Unit received for repair
- Unit dismantled and inspected
- Components requiring rewind charred in char oven (1S, 2S or 3S)
- Components not requiring rewind steam cleaned and baked dry in oven (4S, 5S or 7S)

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- Rewind component - new windings installed - and VPI process coating performed (8S)
- New winding baked after VPI process (4S, 5S or 7S)
- Small parts glass bead cleaned in abrasive cabinet (10S or 11S)
- Unit re-assembled and tested
- Unit painted (6S)

A more detailed description of the equipment utilized at the facility was provided in Application R13-1442B which provide a much more detailed description of the bake and curing ovens, the blast booths and associated emissions:

The facility consists of:

- six (6) ovens:
 - five (5) natural gas-fired, each oven rated at 1.26 MM Btu/hr or less, and
 - one (1) electric oven;
- one (1) small paint booth equipped with a filter system (booth is used to paint motor housings);
- one VPI coater;
- one varnish dip tank; and
- two (2) abrasive blast booths.

Burnout/Char Ovens (1S and 2S)

Heat-cleaning ovens are designed to remove combustible material from reclaimable metal parts. Combustible material consists of insulating resin from electric motor windings.

Magnetech uses three (3) different burnout/char ovens, two of which are fired by natural gas:

- Steelman Char Oven (1s) - Dimensions: 8' x 8' x 8'. This oven is fired by natural gas. The total heat input, both primary chamber (0.52 MM Btu/hr) and afterburner (0.78 MM Btu/hr) is 1.255 MM Btu/hr. The charging capacity is 20,000 pounds. It is Model 888BA-E.
- Bayco Char Oven (2S) - Dimensions: 4' x 4' x 4'. This oven is fired by natural gas. The oven manufacturer is Bayco, Industries of California. The charging capacity is 5,000 pounds. It is a Model BB-64.
- ACE Burnout Oven (3S) - ACE stands for Armature Coil Equipment, Inc., the company's name who built the oven. Electricity is used to heat this oven. No emissions were quantified for this oven.

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Bake Ovens (Cure) (4S, 5S, and 7S)

Magnetech uses three (3) different bake ovens (cure), all three natural gas-fired:

- Steelman Bake Oven (4S) - Model 888GTC. Total heat input is 0.6 MM Btu/hr. Charging capacity is 20,000 pounds.
- Bayco Bake Oven (5S) - Model CB-150G. Total heat input is 0.75 mm Btu/hr. Charging capacity is 5,000 pounds.
- Bayco Bake Oven (7S) - Model CB-180G. Total heat input is 0.75 MM Btu/hr. Charging capacity is 5,000 pounds.

Paint Booth (6S)

According to information supplied with application (R13-1442C), a filter having a 90% efficiency is used to control particulate matter emissions from spray painting. Additional paints available for use are included within application R13-1442C.

VPI Process Coating (8S) and Varnish Dip Tank (9S)

The epoxy tank is an enclosed system that also contains a storage tank filled with resin, a vacuum pump, and a 'chiller'. This process is used mainly for Vacuum Pressure Impregnation (VPI) in the rebuilding of the electric motors in order to make them last longer and work more efficiently. As the system is totally enclosed, potential emissions are thought to be negligible.

Abrasive Blast Cabinets (10S and 11S)

Magnetech operates two abrasive blast cabinets that use glass bead blasting media to clean electrical equipment components. Each blast cabinet is vented to its own baghouse filter assembly (4C or 5C) which has a minimum PM removal/control efficiency of 99%.

According to permit application (R13-1442B), the following process steps/procedure is used:

The electrical equipment component to be cleaned is identified and placed into one of the cabinets. Glass bead blasting media is loaded into an internal hopper for the designated cabinet to be operated. Blasting is started. Exhaust/dust enters the cabinets baghouse and is captured in the filter assembly system. Any escaped residue falls to a catch pan at the bottom of the cabinet. Residue dust is disposed of in a trash receptacle.

MSDS SHEETS

Magnetech submitted eight (8) Material Safety Data Sheets (MSDS) with their application for

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the materials used and/or applied in their normal operations. They are summarized below:

Paint Booth (6S)

- Red Enamel - SYNTHITE® ER-41. According to the John C. Dolph Company: A high temperature; fast cure, air dry, polyurethane varnish. An excellent insulator coating for all electrical and electronic part. Pounds per gallon 7.9 to 9.0. VOC content - 4.4 lbs/gal.
- Red Enamel - SYNTHITE® ER-41. Additional information by John C. Dolph Company. Red, Air-Drying Varnish. **Xylene** 30-50% weight. **Ethyl Benzene** 7-15% weight.
- Slate Green - F77W8 Custom Match-Slate Green. Made by The Sherwin Williams Company, Cleveland, OH. Ingredients: Lt. Aliphatic Hydrocarbon Solvent 10.00%; **Toluene** 17.00%; **Ethyl Benzene** 4%; **Xylene** 22.00%; LT. Aromatic Hydrocarbons 1.00%; 1,2,4-Trimethylbenzene 2.00%; and Titanium Dioxide 14.00%.
- Safety Yellow - B66Y11037 Safety Yellow. Made by The Sherwin Williams Company, Cleveland, OH. Ingredients: Benzophenone 0.2%; Fluoropolymer <0.1%; and Titanium Dioxide 6.00%.
- ANSI Yellow - 513 ANSI Yellow LFCF. Made by Columbia Paint Corporation, Huntington, WV. Ingredients: Solvent Naphtha 46.32%; Titanium Dioxide 4.25%; **Xylene** 2.24%; Solvent Naphtha Medium Aliphatic 1.19%; and **Ethyl benzene** 0.63%.
- Machinery Gray - 20-084A 593NBV Machinery Gray LF. Made by Columbia Paint Corporation, Huntington, WV. Ingredients: Limestone 16.83%; Solvent Naphtha Light Aliphatic 16.84%; Butyl Acetate 9.9%; Titanium Dioxide 6.71%; Solvent Naphtha Light Aliphatic 5.12%; Aromatic Hydrocarbons 1.52%; Carbon Black 0.31%; **Ethyl Benzene** 0.17%; **Naphtalene** 0.11%.
- Xylene - Xylene. Made by Columbia Paint Corporation, Huntington, WV. Ingredients: **Xylene** 80.00%; **Ethyl Benzene** 20.00%.

VPI Process Coating (8S)

- VPI Varnish - Resin Permafil®707 manufactured by Von Roll USA, Inc. According to Von Roll: Flexible in stressful applications; protects windings in harsh thermal and mechanical shock environments; excellent coverage and retention; good processing characteristics; low weight loss during

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heat aging; exceptional electrical properties.

Permafil® 707 solventless polyester resin is a semi-rigid resin system designed primarily for vacuum-pressure impregnation of both form wound and random wound motors. Its high thermal capability coupled with its excellent electrical properties over a wide temperature range make this resin system suitable for both AC and DC applications.

Total Weight - 8.95 lb/gal; Volatile Content - ≤ 2.45 lb/gal.

Manufacturer Von Roll USA, Inc. Product ID: 707C. This product is an insulating varnish or Catalyzed Polyester Solution. Vinyl Toluene 30 -60% by weight; Dicumyl Peroxide 1 - 5 % by weight.

Varnish Dip Tank (9S)

(New) DIP Varnish - Permafil 74041. Manufacture Von Roll USA, Inc. Epoxy Resin. Catalyzed Polyester Solution. Diallyl Phthalate 30 - 60% by weight; Hexamethyl Methylolmelamine 1 - 5 % by weight; Dicumyl Peroxide 1 - 5% by weight; **Formaldehyde** < 0.05% by weight.

For 74041 catalyzed, 4.4 lb VOC/gal by ASTM D-6053 (500g, 4-5 hr @160°C)

Abrasive Blast Cabinets (10S and 11S)

Blast Media - Ballotini Impact Beads; impact abrasive; Potters Industries, LLC; glass oxide; glass 100% by weight.

The chemicals highlighted in **red** above are HAPs:

Ethyl Benzene (100-41-4)

Formaldehyde (50-00-0)

Naphthalene (91-20-3)

Styrene (100-42-5)

Toluene (108-88-3)

Xylene (1330-20-7)

SITE INSPECTION

Magnetech was last inspected by Mike Rowe of the Compliance and Enforcement Section of the Division of Air Quality on July 30, 2015. The inspection was a full on site inspection at which time Magnetech was given the inspection code of 30 - In Compliance.

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Directions to the facility as given in permit application are as follows:

At the intersection of Rt. 60 West (5th Ave & 1st St.) turn right (south) onto 1st St. Continue three (3) city blocks to intersection of 1st St. And 8th Ave. Turn right (west) onto 8th Ave. Continue five (5) city blocks to the intersection of 5th St. West & 8th Ave. Site is located on the southwest corner of the intersection.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

The following information came from an October 21, 2012 letter written by Gene Coccari, DAQ Small Business Assistance Program, to Keith Blankenship, Operation Manager for Magnetech, in regards to permit application (R13-1442B). This information is included to provide an overview of the ovens and associated emissions:

Burnout/Char Ovens (Natural Gas-fired) (1S, 2S, 3S)

According to Steelman Industries, Inc., the emission rates for the burnout/char oven (Steeleman 888 BA-E) given in the table below are estimated by scaling actual stack test results from an oven with a greater input and processing rate. (Application R13-1442B).

The results given in the table below are from oven manufacturer, Bayco Industries of California (Technical Bulletin BB-77-1, revised 4/10/1977). (Application R13-1442B).

Pollutant	Burnout Ovens			
	⁽¹⁾ Steelman Model 888BA-E (1S)		⁽²⁾ Bayco Model BB-64 (2S)	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
⁽³⁾ PM ₃₀	0.03	0.13	0.05	0.22
SO ₂	0.02	0.06	0.01	0.02
NO _x	0.15	0.63	0.08	0.32
CO	0.02	0.07	0.04	0.16
VOC	0.03	0.13	0.02	0.06

(1) Total heat input of 1.255 MM Btu/hr, including the primary chamber and the afterburner.
(2) Total heat input of 0.49 MM Btu/hr.
(3) PM emissions were judged by the writer to be too restrictive. They are given in R13-1442B as PM₁₀ emissions to give the permittee "wobble room" to operate.

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Bake Ovens (Cure) (4S, 5S and 7S)

The emission rates for the Steelman 888 GTC bake oven are taken from the bottom table on page 131 of the permit (Application R13-1442B).

The emission rates given in the table below are from the oven's manufacturer: Bayco Industries of California. The emission rates appear in Bayco's Technical Bulletin BB-77-1, revised 4/10/1977. (See application R13-1442B).

Pollutant	Bake Ovens (Cure)					
	Stelman Model 888GTC (4S)		Bayco Model CB-150G (5S)		Bayco Model CB-180G (7S)	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
⁽¹⁾ PM ₃₀	0.02	0.09	0.12	0.51	0.14	0.60
SO ₂	0.01	0.05	0.01	0.04	0.01	0.04
NO _x	0.02	0.09	0.18	0.75	0.20	0.88
CO	0.01	0.05	0.09	0.37	0.10	0.43
VOC	0.01	0.05	0.03	0.13	0.04	0.15

(1) PM emissions were judged by the writer to be too restrictive. They are given in R13-1442B as PM₁₀ emissions to give the permittee "wiggle room" to operate.

Paint Booth (6S)

The following information came from an October 30, 2015 letter written by Gene Coccari, DAQ Small Business Assistance Program, to Deb McCallister, Office Manager for Magnetech, in regards to permit application (R13-1442C). The paint booth emissions are calculated based on the estimated additional approved paints and solvent use:

Pollutant	Paint Booth (6S)	
	R13-1442C (Controlled by Filter)	
	(lb/hr)	(ton/yr)
PM	20	1.875
PM ₁₀	10	0.9
VOC	20	1.64
HAP's	24	0.12

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VPI (8S) and Dip Tank (9S)

Pollutant	Vacuum Pressure Impregnation (VPI) and Varnish Dip Tank			
	VPI Process Coating (8S)		Varnish Dip Tank (9S)	
	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
VOC	1.00	3.675	1.00	1.20

Abrasive Blast Cabinets (10S and 11S)

The following information came from an October 21, 2012 letter written by Gene Coccari, DAQ Small Business Assistance Program, to Keith Blankenship, Operation Manager for Magnetech, in regards to permit application (R13-1442B). This information is included to provide an overview of the two abrasive blast cabinets and their associated emissions:

Magnetech uses approximately 1,000 pounds of abrasive beads in a year. Increasing the rate up to 5,000 lb/year, uncontrolled PM emissions (as estimated by Gene Coccari) were calculated at 345 lb/yr. Each cabinet has its own baghouse filter assembly with a PM control/removal efficiency of 99%. After controls, emissions were estimated to be 3.45 lb/yr.

Since the estimated hourly and annual controlled PM emission rates are so small, a usage rate limitation of 5,000 lb/yr of abrasive beads was used in the permit instead of an hourly and annual PM emission rate limit.

REGULATORY APPLICABILITY

The facility is a minor source for criteria pollutants, and HAPs. It is not subject to Title V.

45CSR6 - Control of Air Pollution from Combustion of Refuse

Magnetech's two (2) natural gas-fueled burnout ovens (1S and 2S), each having an afterburner, are viewed by DAQ as being incinerators. The particulate emissions data from the oven manufacturers was used to set PM limits in the permit (Sections 5.1.1 and 5.1.2). Note that these limits are stricter than what is required under Section 45CSR§6-4.1.

Applicable Sections of 45CSR§6 quoted in the permit are:

45CSR§6-4.1 - Calculate PM lb/hr limit, quoted in permit Section 5.1.4;

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- 45CSR§6-4.3 - Opacity limit (\geq 20% opacity), quoted in permit Section 5.1.5;
- 45CSR§6-4.4 - Allowable opacity during startup & stoking operations, quoted in permit Section 5.1.6; and
- 45CSR§6-4.6 - Objectionable odors, quoted in permit Section 5.1.7.

45CSR7 - To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associated Operations

The three natural gas-fired bake ovens (4S, 5S, and 7S), having no afterburners, and the paint filter booth (6S), VPI (8S), varnish dip tank (9S), and two (2) abrasive blast cabinets (10S and 11S) were viewed as being subject to the emissions standards of 45CSR7.

Applicable Sections of 45CSR§7 quoted in the permit are:

- 45CSR§7-3.1 - Opacity limit ($>$ 20% opacity), quoted in permit Sections 6.1.4 and 7.1.11;
- 45CSR§7-4.1 - Calculate PM lb/hr limit, quoted in permit Section 6.1.5;
- 45CSR§7-5.1 - Control system for fugitive emissions, quoted in permit Sections 6.1.6 and 7.1.12;
- 45CSR§7-8.1 - PM testing of exhaust gases, quoted in permit Sections 6.1.7 and 7.1.13.
- 45CSR§7-8.2 - Testing by the Director, quoted in permit Section 6.1.8 and 7.1.14.
- 45CSR§7-9.1 - Application to Director for malfunctions, quoted in permit Section 6.1.9 and 7.1.15.

45CSR13 - Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation

The changes proposed in this application are viewed under Rule 13 as being a Class II Administrative Update.

45CSR21 - Regulation to Prevent and Control Air Pollution From the Emission of Volatile Organic Compounds

This facility is located in Cabell County which is subject to Rule 21. It could be subject to the following sections of Rule 21 if uncontrolled VOC emissions from all magnet wire coating lines/operations within the facility should ever equal or exceed 15 pounds per day:

- Section 18, "Coating of Magnet Wire"
- Section 19, "Coating of Miscellaneous Metal Parts"

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TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

See the section entitled "MSDS Sheets" given above.

AIR QUALITY IMPACT ANALYSIS

No air quality impact analysis was conducted for this Class II Administrative Update.

MONITORING OF OPERATIONS

- Maintenance and malfunction records are to be kept for all control equipment. See Section 4 of R13-1442C for additional information.
- The following records are to be kept for the Burnout/Char Ovens (1S and 2S). See Section 5 of R13-1442C for additional information.
 - Monthly records of visible emission checks for Burnout/Char Ovens (1S and 2S) opacity.
 - Daily records of what was burned and hours of operation for the Burnout/Char Ovens (1S and 2S).
- The following records are to be kept for the Bake Ovens (4S, 5S and 6S). See Section 6 of R13-1442C for additional information.
 - Monthly records of visible emission checks for Bake Ovens (4S, 5S and 6S) opacity.
 - Daily records of what was burned and hours of operation for the Burnout/Char Ovens (1S and 2S).
- The following records are to be kept for the Paint Filter Booth (6S), VPI (8S), Varnish Dip Tank (9S) and Abrasive Blast Cabinets (10S and 11S). See Section 7 of R13-1442C for additional information.
 - Monthly records of visible emission checks for Paint Filter Booth (6S) opacity.
 - Daily records of Paint Filter Booth (6S):
 - hours of operation,
 - coatings applied: names and ID #s,
 - paints and solvents used,
 - paints and thinners/reducers - VOC content of each used,

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- total VOC emissions (calculated), and
- 12-month rolling VOC emission total for the facility (calculated).
- Daily records of VPI System (8S) and Varnish Dip Tank (9S):
 - hours of operation and
 - amount, and VOC and HAP content of varnish used/or added.
- Daily records of Abrasive Blast Cabinets (10S and 11S):
 - hours (each blast cabinet) operated, and
 - amount of blast beads used and/or added to each blast cabinet.
- Daily records of Cleaning Solvents:
 - used (name of each solvent),
 - VOC content of cleaning solvent,
 - total VOC emission rate, and
 - 12-month rolling VOC emission rate for the facility.

CHANGES TO PERMIT R13-1442B

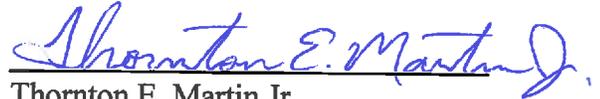
Permits R13-1442B and R13-1442C were developed using the NSR Permit Revision 2-1-13 format. The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be:

- PM = 2 TPY; PM₁₀ = 1 TPY; VOC = 7.0 TPY and Total HAP's = 0.5 TPY.
- VOC emissions from the paint filter booth was increased in Section 7.1.2 of R13-1442C to 20 lb/hr. The new permit includes an annual HAP emission limit.
- Particulate emissions from the paint filter booth was increased in Section 7.1.2 of R13-1442C to 20 lb/hr. The new permit includes an annual PM₁₀ emission limit of 0.9 ton/yr.
- Solvent emissions was increased to 10 lb/day or 1.825 tons/yr. This limit was changed in Section 7.1.5. of R13-1442C.
- VOC emissions from the Vacuum Pressure Impregnation System (VPI) (8S - Emission Unit ID; 8E - Emission Point ID) shall not exceed 1.00 lb/hr and 3.675 ton/yr. This limit was changed in Section 7.1.6. of R13-1442C.
- VOC emissions from the Varnish Dip Tank (9S - Emission Unit ID; 9E - Emission Point ID) shall not exceed 1.00 lb/hr and 1.20 ton/yr. This limit was changed in Section 7.1.5. of R13-1442C.

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RECOMMENDATION TO DIRECTOR

The writer recommends that the Director approve R13-1442C based on the evaluation of permit application and the resulting revisions made to the permit which include increased emission limits based on new materials and quantities involved.



Thornton E. Martin Jr.
Permit Engineer

June 06, 2016

Date