



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: **032015-003**Project Number: 2014-10-016
Installation Number: 510-1011

Parent Company: Microfinish IPC LLC

Parent Company Address: 4001 Gratiot Street, St. Louis, MO 63110

Installation Name: Microfinish IPC, LLC

Installation Address: 4001 Gratiot Street, St. Louis, MO 63110

Location Information: St. Louis City, Land Grant 00363

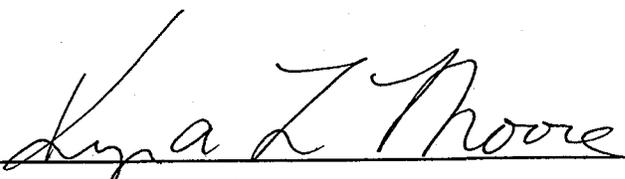
Application for Authority to Construct was made for:
Installation of a trivalent decorative chrome electroplating line. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

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

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

MAR 04 2015

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 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."

Microfinish IPC, LLC
St. Louis City County, Land Grant 00363

1. HAP Emission Limitations
 - A. Microfinish IPC, LLC shall not exceed 1.0 ton of Nickel metal in any consecutive 12-month period from their nickel plating tanks (217-11 and 217-12)
 - B. Attachment A 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.
2. Control Device Requirement-Fume Suppressant
 - A. Microfinish IPC, LLC shall control emissions from the electroplating line (Line 217) using a wetting agent in the following process tanks:
 - 1) Semi-Bright Nickel Plating (217-11)
 - 2) Bright Nickel Plating (217-12)
 - 3) Trivalent Decorative Chromium Plating (217-15)
 - B. The wetting agent shall be used in accordance with the manufacturer's specifications and 40 CFR Part 63, Subpart WWWW, *Area Source Standards for Plating and Polishing Operations*
 - C. Microfinish IPC, LLC shall maintain a copy of the wetting agent manufacturer's performance warranty on site.
 - D. Microfinish IPC, LLC shall maintain an operating log for the application of the wetting agent that includes the following:
 - 1) The initial wetting agent amount recommended by the manufacturer for the specific type of electrolytic process.
 - 2) The amount of wetting agent added such that the bath is brought back to the original make-up of the tank.
 - 3) A record of each addition of wetting agent to the tank bath.

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SPECIAL CONDITIONS:

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

3. Operational Requirement – Plating Solutions and Acids
Microfinish IPC, LLC shall keep the organic solvents and cleaning solutions in sealed containers whenever the materials are not in use. Microfinish IPC, LLC shall provide and maintain suitable, easily read, permanent markings on all inks, solvent and cleaning solution containers used with this equipment. This condition does not apply to the aqueous alkaline cleaning solutions since these cleaners do not contain VOCs.
4. Operational Requirement – Amp/Hour Meters
 - A. Microfinish IPC, LLC shall install amp-hour meters on the rectifiers of the following plating tanks.
 - 1) Semi-Bright Nickel Plating Tank (217-11)
 - 2) Bright Nickel Plating Tank (217-12)
 - B. Readings shall be used to demonstrate compliance with Special Condition 1.A.
5. Record Keeping and Reporting Requirements
 - A. Microfinish IPC, LLC 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. Microfinish IPC, LLC 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 show an exceedance of a limitation imposed by this permit.

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

Project Number: 2014-10-016
Installation ID Number: 510-1011
Permit Number:

Microfinish IPC, LLC
4001 Gratiot Street
St. Louis, MO 63110

Complete: October 21, 2014

Parent Company:
Microfinish IPC LLC
4001 Gratiot Street
St. Louis, MO 63110

St. Louis City, Land Grant 00363

REVIEW SUMMARY

- Microfinish IPC, LLC has applied for authority to construct a nickel and trivalent decorative chrome electroplating line.
- HAP emissions are expected from the proposed equipment. HAPs of concern from this process are nickel metal and chromium (+3).
- None of the New Source Performance Standards (NSPS) apply to the installation.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart N, *National Emission Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks* applies to the decorative trivalent chromium electroplating tank.
- MACT standard, 40 CFR Part 63, Subpart W, *National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations* applies to the nickel electroplating tanks. Microfinish's passivate tank as currently proposed is regulated under 6W. However, should the passivate tank's chemistry be formulated to not include sodium dichromate, it would not be regulated under 6W.
- A wetting agent is being used to control the particulate aerosol emissions from the bright and semi-bright nickel plating, and the trivalent decorative chromium plating in this permit. A wetting agent may be used for the electrocleaning and passivate processes, but is not required; These emissions are assumed for potential emission purposes to be uncontrolled.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of nickel metal are conditioned to not exceed the SMAL.

- This installation is located in St. Louis City, a nonattainment area for the 8-hour ozone standard and the PM_{2.5} standard and an attainment area for all other 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 100 tons per year for ozone and PM_{2.5} and 250 tons per year for all other pollutants. Fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential Nickel Metal emissions of the application were voluntarily conditioned not to exceed the SMAL.
- Emissions testing is not required for the equipment.
- A Basic Operating Permit amendment application is required for this installation within 30 days of permit issuance.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Microfinish IPC, LLC, located in St. Louis City, Missouri, consists of metal finishing, zinc plating, nickel chrome plating, e-coating, and powder coating processes. The facility currently has 3 plating lines numbered 211, 216, and 230 and has been operating under the authority of the City of St. Louis Permit #OP10001 since 2009. Plating operations consist of various customer parts. Jobs vary between the automotive, appliance and many other industries with a high percentage of parts being manufactured from steel.

No construction permits have been issued to Microfinish IPC, LLC from the Air Pollution Control Program.

PROJECT DESCRIPTION

Microfinish IPC, LLC has proposed the installation of a decorative nickel chrome plating line (Line 217) using trivalent chemistry in the chrome plating section of the line. Along with this installation, Microfinish IPC, LLC will be dismantling and removing two abandoned nickel chrome electroplating lines 211 and 230, which used hexavalent chrome chemistry and trivalent chrome chemistry respectively. The emission units associated with Line 217 are listed in Table 1.

The plating process begins with a double cleaning cycle consisting of a potassium hydroxide and sodium hydroxide soak followed by a rinse, sodium hydroxide electrocleaner, and another rinse to clean and remove dirt, oil and grease from the metal parts. A hydrochloric acid (HCl) pickle will be used to remove scale, rust and other foreign matter. The HCl solution will be received as 20 degree Baume' HCl, 32% by weight, however, will be diluted to a maximum of 14.4% by weight of hydrochloric acid to be used in the pickling tank. Parts will go through another sodium hydroxide electrocleaner and then an electrolytic acid comprised of sodium bisulfate and sodium fluoride to remove any metal

oxides from the surface of the substrate metal and provide a more active and rougher surface to which the plated materials can better adhere.

After the cleaning process, parts will go through the semi-bright nickel plating tank, followed by the bright nickel plating tank, with both baths consisting of nickel chloride, nickel sulfate, boric acid, and a wetting agent. The parts will then move to the trivalent decorative chromium plating tank, with a bath consisting of potassium chloride, boric acid, and a wetting agent. After plating, parts will go through the passivate tank. Finally, parts are rinsed with deionized water and then dried in the natural gas fired parts dryer.

Table 1: Electroplating Line 217 Emission Units.

Emission Unit	Description	Primary Chemical of Concern	Maximum Hourly Design Rate	Tank Surface Area (ft ²)
	Soak Cleaning Tank			
217-3	Electroclean	NaOH	3,000 Amps	21.125
217-5	Hydrochloric Acid Pickle	HCl	0.008 lb/hr-ft. ²	28.167
217-7	Electroclean	NaOH	3,000 Amps	21.125
217-9	Electrolytic Acid	H ₂ SO ₄	1,500 Amps	7.04
217-11	Semi-Bright Nickel Plating	Nickel Metal	10,000 Amps	116.19
217-12	Bright Nickel Plating	Nickel Metal	5,000 Amps	70.62
217-15	Chrome Plating	Chromium (+3)	10,000 Amps	49.29
217-18	Passivate	Chromium (+3)	N/A	7.08
217-22	Natural Gas Dryer	N/A	1.5 MMBtu	N/A

N/A = Not Applicable

EMISSIONS/CONTROLS EVALUATION

The particulate matter emission factors and particle size distribution used in this analysis for the nickel plating (214-11 and 217-12) were obtained from the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 12.20 *Electroplating*, July 1996, SCC 3-09-010-28. The control efficiency for the use of a wetting agent was taken from a document prepared by Scientific Control Laboratories, Inc., titled *Testing Nickel Emissions from Metal Finishing Operations (Phase 2)*, April 2007. This report concluded that the use of wetting agents to reduce the surface tension of a nickel plating solution reduces the nickel emissions from that process an average of 72% from uncontrolled tanks. The total mass of the nickel compound was used to determine emissions for comparison to the major source threshold. The mass of the nickel metal portion of the compound was used to determine emissions for comparison to the SMAL.

Emissions from electrocleaning, trivalent decorative chromium plating, and passivate were calculated using data from EPA's *Metal Finishing Facility Risk Screening Tool (MFFRST): Technical Documentation and User's Guide*, July 2001. The concentration of chromium emissions from hard chromium plating (Cr +6) were related to various surface coating operations in the electroplating industry by calculating the relative concentration of the constituent proportional to the current density applied to the plating operation, the inverse of the cathode efficiency, and the concentration of the chemical components in the process tank. The minimum ventilation rate (29 CFR, Part 1910, OSHA) for the various surface coating operations along with the tank area were used to calculate the volumetric flow rates. The controlled emissions were calculated using the concentration levels of atmospheric emissions with the use of fume suppressants (@ <28 dyne/cm) multiplied by

the volumetric flow rates.

Emissions from the HCl pickle were calculated using Texas Commission on Environmental Quality's Calculations Guidance Package, *Chromium Plating and Anodizing Operations Using Chromic Acid*. Since this process is not already operational, worst case assumptions were made regarding the operating temperature and the air velocity across the surface of the tank. The potential HCl emissions were calculated with a tank temperature of 40 °C (104 °F) and an air velocity of 15 feet per second (~10 mph). The maximum HCl percent by weight used will be 14.4%, as stated in the permit application. However, an HCl concentration of 16% by weight was used in calculating the potential to emit to avoid possible errors in interpolating the partial pressures of HCl over aqueous solutions of HCl.

The emission factors used in this analysis for the natural gas fired dryer (217-22) were obtained from AP-42, Section 1.4, *Natural Gas Combustion*, July 1998, SCC 1-01-006-02

The following table provides an emissions summary for this project. Existing potential emissions do not exist since they were not calculated in the current Basic Operating Permit. Existing actual emissions were taken from the installation's 2013 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year). Conditioned potential emissions of the application account for control devices and the voluntary limit of total nickel metal to avoid exceeding the SMAL.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels/SMAL	Existing Potential Emissions	Existing Actual Emissions (2013 EIQ)	Uncontrolled Potential Emissions of the Application	Conditioned Potential Emissions of the Application
PM	25.0	N/A	N/D	5.93	1.01
PM ₁₀	15.0	N/A	0.30	3.56	0.64
PM _{2.5}	10.0	N/A	0.06	2.91	0.53
SO _x	40.0	N/A	0.00	0.004	0.004
NO _x	40.0	N/A	0.60	0.644	0.64
VOC	40.0	N/A	0.03	0.035	0.035
CO	100.0	N/A	1.34	0.54	0.54
GHG (CO ₂ e)	N/A	N/A	N/D	777.53	777.53
GHG (mass)	0.0 / 100.0 / 250.0	N/A	N/D	772.97	772.97
HAPs	10.0/25.0	N/A	0.38	6.92	2.64
Nickel Metal ¹	1.00	N/A	N/D	5.91	≤ 1.00
Nickel Compounds	10.0	N/A	N/D	15.59	2.64
Chromium (+3) ¹	5.00	N/A	N/D	0.003	9.54E-06

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

¹ Compared to the 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 nickel metal are voluntarily conditioned to not exceed the SMAL.

APPLICABLE REQUIREMENTS

Microfinish IPC, LLC 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

- *MACT Regulations*, 10 CSR 10-6.075
 - *National Emission Standards for Chromium Emissions From Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks* applies, 40 CFR Part 63, Subpart N, applies to the trivalent decorative chromium electroplating tank.
 - *National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations*, 40 CFR Part 63, Subpart WWWW, applies to the nickel electroplating tanks.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Susan Heckenkamp
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 September 28, 2014, received October 6, 2014, designating Microfinish IPC LLC as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

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	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		

Mr. Patrick Gleason
Operations Manager
Microfinish IPC, LLC
4001 Gratiot Street
St. Louis, MO 63110

RE: New Source Review Permit - Project Number: 2014-10-016

Dear Mr. Gleason:

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.

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, Truman State Office Building, P.O. Box 1557, Jefferson City, Missouri 65102, www.oa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact me at the Department of Natural Resources' Air Pollution Control Program (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:shl

Enclosures

c: St. Louis Regional Office
PAMS File: 2014-10-016
Permit Number: