



Louisville Metro Air Pollution Control District
 701 West Ormsby Avenue, Suite 303
 Louisville, Kentucky 40203-3137



April 14, 2020

**Federally-Enforceable District-Origin Operating Permit
 (FEDOOP)
 Statement of Basis**

Source: Forth Technologies, Inc.
 600 Bergman Avenue
 Louisville, KY 40203

Owner: Forth Technologies, Inc.
 600 Bergman Avenue
 Louisville, KY 40203

Application Documents: See Table I-9

Draft Permit: 04/14/2020

Permitting Engineer: Randy Schoenbaechler

Permit Number: O-1231-20-F

Plant ID: 1231

SIC: 2816, 2869

NAICS: 325130, 325110

Introduction:

This permit will be issued pursuant to District Regulation 2.17- Federally Enforceable District Origin Operating Permits. Its purpose is to limit the plant wide potential emission rates from this source to below major source threshold levels and to provide methods of determining continued compliance with all applicable requirements.

This is a renewal of the operating permit and includes update to the newest format and equipment list.

Jefferson County is classified as an attainment area for lead (Pb), nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter less than 10 microns (PM₁₀), and particulate matter less than 2.5 microns (PM_{2.5}). Jefferson County is classified as a nonattainment area for ozone (O₃). This facility is located in the portion of Jefferson County that is an attainment area for sulfur dioxide (SO₂).

Permit Application Type:

- | | | |
|---|--|--|
| <input type="checkbox"/> Initial issuance | <input type="checkbox"/> Permit Revision | <input checked="" type="checkbox"/> Permit renewal |
| | <input type="checkbox"/> Administrative | |
| | <input type="checkbox"/> Minor | |
| | <input type="checkbox"/> Significant | |

Compliance Summary:

- | | |
|--|---|
| <input type="checkbox"/> Compliance certification signed | <input type="checkbox"/> Compliance schedule included |
| <input type="checkbox"/> Source is out of compliance | <input checked="" type="checkbox"/> Source is operating in compliance |

I Source Information

1. Product Description:

Forth Technologies is a pigment manufacturing facility.

2. Process Description:

The raw materials are ground, mixed, and dried to produce various types of pigments.

3. Site Determination:

There are no other facilities that are contiguous or adjacent to this facility.

4. Emission Unit Summary:

Unit U1: Operation Equipment
 Unit UIA1: Natural Gas Boiler
 Unit UIA2: Small Batch Operation

5. Fugitive Sources:

The source identified no fugitive sources of emissions.

6. Permit Revisions:

Permit No.	Public Notice Date	Issue Date	Change Type	Description/Scope
27825-14-F	5/23/2014	6/30/2014	Initial	Initial Permit Issuance
27825-14(R1)	12/9/2014	1/23/2015	Sig	Clarification in U1 Description of equipment and U1 Equipment table; removal of Tank #1 from U1 PM/PM10 Standards; changes and corrections made to U1 PM/PM10 Standards
27825-14-F(R2)	02/10/2017	3/15/2017	Sig	Construction Permit incorporated to replace existing C2 wet scrubber with two baghouses (C2(a) and C2(b)) and introduce new production capacity of the solids from the spray dryer SD-1 (E3) from 165 lb/hr to 300 lb/hr. Updated General Condition 10.
			Admin	Updated to Permit to Newest format
O-1231-20-F	04/14/2020		Renewal	Additional Equipment E61 Tray Dryer/Oven TD-3; Hayes LTO-E (electric) E62 Tray Dryer/Oven TD-4; Hayes LTO-E (electric) E63 Tray Dryer/Oven TD-5; Infatrol (natural gas) 1.2 MMBtu/hr burner for dryer E28 Fiberglass Mix Tank (Tank #8)

Permit No.	Public Notice Date	Issue Date	Change Type	Description/Scope
				<p>E29 Bauermeister Mill</p> <p>E40a Stainless Steel holding tank</p> <p>E51a filter press #9</p> <p>E60 Diethylene Glycol storage tank</p> <p>E64 Sodium Hydroxide storage tank</p> <p>Removed Equipment</p> <p>E10 Attritor A-7</p> <p>E11 Attritor A-8</p> <p>E12 Attritor A-9</p> <p>C7 wet scrubber (SBM01SC01) for VOC</p> <p>C8 dust collector (SBM01DC01) for PM</p> <p>C18 Donaldson Torit baghouse, model 9PJD6</p> <p>C19 Donaldson Torit baghouse, model 3DF6</p> <p>Updated Operation Equipment description</p> <p>E3(a) Tank T-21 for pigment slurry</p> <p>E3(b) Tank T-22 for pigment slurry</p> <p>E4(a) Tank T-25 for pigment slurry</p> <p>E4(b) Tank T-26 for pigment slurry</p> <p>E15 mix tank (Tank #35)</p> <p>E19 Pfaulder reactor tank (Tank #30), model 316SS</p> <p>E48 complex filtration tank (Tank #12)</p> <p>E50 basic dye make tank (Tank #3)</p> <p>Control Equipment added</p> <p>"dust collector" C12a</p> <p>"dust collector" C20</p> <p>"dust collector" C21</p> <p>"dust collector" C22</p> <p>Insignificant Activities added</p> <p>"dust collector" Torit Model 84</p> <p>"dust collector" Torit Model 84</p> <p>"dust collector" Torit Model VS550</p> <p>"dust collector" Torit Model VS550</p> <p>"dust collector" Torit Model VS550</p> <p>"dust collector" Torit Model V1550</p> <p>"dust collector" Torit Model 75/80</p> <p>"dust collector" Torit Model 80CAB</p> <p>Updated to Permit to Newest format</p>

7. Construction Permit History Since Last Operating Permit:

Permit No.	Effective Date	Description
NA	NA	NA

8. Application and Related Documents

Document Number	Date	Description
18925	10/11/2018	FEDOOP Application and Control Device Correspondence
21014	1/28/2019	FEDOOP Application and Control Device Correspondence
21675	3/6/2019	FEDOOP Application and Control Device Correspondence
21738	3/11/2019	FEDOOP Application and Control Device Correspondence
21754	3/11/2019	FEDOOP Application and Control Device Correspondence
22076	3/13/2019	FEDOOP Application Correspondence 100A
22074	4/3/2019	FEDOOP Application Correspondence
22221	4/15/2019	FEDOOP Application Correspondence
22383	4/23/2019	FEDOOP Application Correspondence
22614	5/16/2019	FEDOOP Application Correspondence
22740	5/29/2019	FEDOOP Application Correspondence
22815	6/4/2019	FEDOOP Application Part two
22814	6/4/2019	FEDOOP Application Part one
22851	6/6/2019	Complete FEDOOP Renewal Application
122477	10/18/2019	FEDOOP Application Questions
122585	10/22/2019	Email Regarding FEDOOP Renewal
124001	11/8/2019	Approved Plantwide PTE update
135688	3/24/2020	Pre-Draft Permit sent to company for review

9. Emission Summary

Pollutant	District Calculated Actual Emissions (tpy) 2018 Data	Pollutant that triggered Major Source Status (based on PTE)
CO	1.35	No
NO _x	1.61	No
SO ₂	0.01	No
PM ₁₀	6.83	Yes
VOC	0.38	No
Total HAPs	0.23	Yes
Single HAP > 1 tpy		
POM	0.0	Yes

10. Applicable Requirements

- 40 CFR 60 SIP 40 CFR 63
 40 CFR 61 District Origin Other

11. Referenced Federal Regulations:

The source has no federal requirements.

12. Non-Applicable Regulations:¹

The District has determined Regulation 7.25 to no longer be applicable to equipment with potential VOC emissions unless the plantwide potential is at least 5 tpy.

II Regulatory Analysis

1. Stratospheric Ozone Protection Requirements:

Title VI of the CAAA regulates ozone depleting substances and requires a phase-out of their use. This rule applies to any facility that manufactures, sells, distributes, or otherwise uses any of the listed chemicals. Forth Technologies, Inc. does not manufacture, sell, or distribute any of the listed chemicals. The source’s use of listed chemicals is that in fire extinguishers, chillers, air conditioners and other HVAC equipment.

¹ These regulations were referenced in the previous permit, but the source is exempt from the regulations or they are otherwise inapplicable.

2. Basis of Regulation Applicability

a. Applicable Regulations

Regulation	Title	Basis
2.17	Federally Enforceable District Origin Operating Permits	Synthetic Minor source
5.00	Standards for Toxic Air Contaminants and Hazardous Air Pollutants	Establishes definitions of terms used in the Strategic Toxic Air Reduction Program.
7.06	Standards of Performance for New Indirect Heat Exchangers	Applies to each indirect heat exchanger having input capacity of more than one million BTU per hour commenced after September 1, 1976.
7.08	Standards of Performance for New Process Operations	Equipment installed after September 1, 1976 and subject to the PM emission standard.
7.12	Standard of Performance for New Storage Vessels for Volatile Organic Compounds	Storage tanks with a capacity greater than 250 gallons constructed after April 19, 1972

b. Plantwide

Forth Technologies, Inc. is potentially major for PM₁₀, Single HAP, and Total HAP. Regulation 2.17 – *Federally Enforceable District Origin Operating Permits* establishes requirements to limit the plant wide potential emission rates to below major source threshold levels and to provide methods of determining continued compliance with all applicable requirements. The source requested limits of the PM₁₀ less than 25 tons per year, total HAP less than 12.5 tpy, and single HAP less than 5 tpy, to be classified as a synthetic minor (FEDOOP) source.

Regulations 5.00 5.20, 5.21, and 5.23 (STAR Program) establish requirements for environmental acceptability of toxic air contaminants (TACs) and the requirement to comply with all applicable emission standards. Forth Technologies, Inc. has requested emission limits of less than 25 tons per year for all regulated air pollutants, less than 12.5 tons/year for total HAPs and less than 5 tons per year for each individual HAP to be considered exempt from local TAC (STAR) regulations, as defined by Regulation 5.00, section 1.13.5.

Regulation 2.17, section 5.2, requires monitoring and record keeping to assure ongoing compliance with the terms and conditions of the permit. The owner or operator shall maintain all the required records for a minimum of 5 years and make the records readily available to the district upon request.

Regulation 2.17, section 7.2, requires stationary sources for which a FEDOOP is issued to submit an Annual Compliance Certification by April 15, of the following calendar year. In addition, as required by Regulation 2.17, section 5.2, the source shall submit regular reports to show compliance with the permit. Compliance reports and compliance certifications shall be signed by a responsible official and shall include a certification statement per Regulation 2.1. The compliance reports are due within 60 days of the end of the reporting period:

<u>Reporting Period</u>	<u>Report Due Date</u>
January 1 - June 30	August 29
July 1 - December 31	March 1 of the following year

c. Emission Unit U1 – Operation Equipment

EP	Description	Applicable Regulations
E-1	Troy Tray Dryer/Oven, TD-1 (Natural Gas)	7.08
E-2	Troy Tray Dryer/Oven, TD-2 (Natural Gas)	7.08
E-3	Spray Dryer (SD-1) Bowen Model BB6, with process cyclone (C1)	7.08
E-3a	Tank -22 for storage of raw material, pigment slurry	7.08
E-3b	Tank -24 (E3b) for storage of raw material, pigment slurry	7.08
E-4	Spray Dryer (SD-2) Bowen Model BB6, with process cyclone (C3)	7.08
E-4a	Tank -26 for storage of raw material, pigment slurry	7.08
E-4b	Tank -27 for storage of raw material, pigment slurry	7.08
E-61	Tray Dryer/Oven TD-3; Hayes LTO-E (electric)	7.08
E-62	Tray Dryer/Oven TD-4; Hayes LTO-E (electric)	7.08
E-63	Tray Dryer/Oven TD-5; Infatrol (natural gas)	7.08
E-7	Attritor A-1 (Sigma Blue Mixer)	7.08
E-8	Attritor A-2 (Sigma Blade Mixer)	7.08
E-9	Attritor A-5 (Sigma Blade Mixer)	7.08
E-13	Storage Tank (Tank #31)	7.12
E-19	Reactor (Tank #34) model 316SS	7.08
E-20	Air Products Fiberglass Mix Tank (Tank #7)	7.08
E-21	Air Products Fiberglass Mix Tank (Tank #9)	7.08

EP	Description	Applicable Regulations
E-22	Filter Press #7, JWJ	7.08
E-23	Filter Press #8, JWJ	7.08
E-24	Air Products Fiberglass Mix Tank (Tank #10)	7.08
E-25	Air Products Fiberglass Mix Tank (Tank #11)	7.08
E-26	DeDietrich Reactor Tank (R-32) model G/L SA2000	7.08
E-27	Fiberglass Mix Tank (Tank #4)	7.08
E-28	Fiberglass Mix Tank (Tank #8)	7.08
E-30	Scott Equipment Ribbon Blender, model GHM4812	7.08
E-31	Bauermeister IDH Hammermill model UT-22	7.08
E-32	LIBCO Tote Dumper	7.08
E-33	Separation Vessel	7.08
E-34	JETFLOW Bagging Unit, model 800 Jetflow Impeller Packer	7.08
E-35	Baker Perkins Sigma Blade Mixer (Flusher #1) with vacuum pump	7.08
E-36	Schold Sigma Blade Mixer (Flusher #2)	7.08
E-37	Schold Mixing System	7.08
E-38	Schold Mixing System	7.08
E-39	Nitzch Milling System, model 25L	7.08
E-40	Homrich/Freudenberg double blade Sigma Mixer Salt Attritor	7.08
E-41	Tank #6	7.08
E-29	Bauermeister Mill	7.08
E-42	Pioneer Blender model FM100B	7.08
E-43	Aaron Equipment Ribbon Blender	7.08
E-44	Custom Ribbon Blender with vibratory screen	7.08
E-45	Abbe Sigma Blade Mixer	7.08
E-46	Mikropul Hammermill	7.08
E-48	Complex Filtration Tank (Tank #12)	7.08

EP	Description	Applicable Regulations
E-49	Dye Solution Tank	7.08
E-50	Basic Dye Make Tank (Tank #3)	7.08
E-51	Dye Filtration Tank with filter press #9 120ft ³	7.08
E-52	Reactor Dissolution Vessel (T-33), model 315 SS	7.08
E-53	Diazotitation Tank (T-36) FRP	7.08
E-54	Strike Tank FRP (T-1, T-2, T-4, T-6, T-7, or T-8)	7.08
E-55	Mikro Pulverizer Hammermill/2DH	7.08
E-55a	Separation vessel Bagging Unit	7.08
E-56	Mikro Pulverizer Hammermill/2HD	7.08
E-56a	Separation vessel Bagging Unit	7.08
E-57	Custom Ribbon Blender	7.08
E-57a	Bagging Unit	7.08
E-58	Custom Ribbon Blender	7.08
E-58a	Bagging Unit	7.08
E-59	NIRO Spray Dryer	7.08

i. Standards

- (1) HAP
 - (a) See Plantwide section.
- (2) NO_x
 - (a) Regulation 7.08, section 4.1 establishes an emission standard for the tray dryers and spray dryers.
- (3) Opacity
 - (a) Regulation 7.08, section 3.1.1 establishes an opacity standard of less than 20% for this equipment.
- (4) PM/PM₁₀
 - (a) The emission standard for PM at all emission points, unless otherwise specified, is determined in accordance with Regulation 7.08, section 3.1.2 as follows:

$$\text{PM lb/hr limit} = 3.59 * (\text{process weight, tons/hr})^{0.62}$$

- (b) Construction permit 85-05-C specifies PM standards for emission points E30, E32, E33, and E34.
 - (c) Construction permit 312-07-C specifies PM standards for emission points E35 and E36.
 - (d) Construction permit 32949-11-C specifies a PM standard for emission point E41.
 - (e) The spray dryer SD-1 cannot meet the PM standard uncontrolled, therefore, Regulation 2.03, section 5.1 requires that the wet scrubber for spray dryer SD-1 shall be utilized to meet the emission standards when the equipment is in operation.
 - (f) Construction permit C-1231-1001-16-F specifies PM standards for emission point E3.
- (5) VOC
- (a) Regulation 7.12 establishes emission standards for storage tanks producing VOC emissions.
 - (b) Construction permit 165-06-C, effective 6/21/2006, establishes vapor pressure limits for materials stored in Storage Tank #31.

d. Emission Unit UIA1– Natural Gas Boiler

EP	Description	Applicable Regulations
IA1	Natural Gas Boiler	7.06

i. Standards

- (1) Opacity
 - (a) Regulation 7.06, section 3.1.1 establishes an opacity standard of less than 20% for this equipment.
- (2) PM
 - (a) Regulation 7.06, section 4.1.4 establishes a particulate matter limit of 0.56 pounds per million BTU actual total heat input.
- (3) SO₂
 - (a) Regulation 7.06, section 4.1.4 establishes a sulfur dioxide limit of 1.0 pounds per million BTU actual total heat input.

e. Emission Unit UIA2– Small Batch Operation

EP	Description	Applicable Regulations
IA5	Baker/Perkins Flusher	7.08
IA6	Custom Flusher	7.08
IA7	Custom Flusher	7.08
IA8	DH Hammermill	7.08
IA9	30" SWECO Screener	7.08
IA12	Rotary Dryer	7.08
IA13	Dyno Horizontal Media Mill 1	7.08
IA14	Dyno Horizontal Media Mill 2	7.08

i. Standards

(1) Opacity

(a) Regulation 7.08, section 3.1.1 establishes an opacity standard of less than 20% for this equipment.

(b)

(2) PM/PM₁₀

(a) The emission standard for PM at all emission points, unless otherwise specified, is determined in accordance with Regulation 7.08, section 3.1.2 as follows:

$$\text{PM lb/hr limit} = 3.59 * (\text{process weight, tons/hr})^{0.62}$$

III Other Requirements

1. Temporary Sources:

The source did not request to operate any temporary facilities.

2. Short Term Activities:

The source did not report any short term activities.

3. Emissions Trading:

The source is not subject to emission trading.

4. Alternative Operating Scenarios:

The source did not request any alternative operating scenarios.

5. Compliance History:

There are no records of any violations of the terms of the present or prior construction or operating permits.

6. Calculation Methodology or Other Approved Method:

The following equations shall be used to determine emissions unless other methods are approved by the District. District approved control device efficiencies listed in the permit may be used for emissions captured by the control device from equipment during periods of operation when the controls are in use.

Liquid Materials/Products Loading/Unloading: The following equation shall be used to determine the VOC emissions from the loading and unloading of liquid VOC containing material:

$$E_{VOC} = 12.46 * \frac{S * P * M * Q}{T}$$

Where,

E_{voc} = VOC Emissions (lb/yr)
 S = Saturation Point
 P = Vapor Pressure (psia)
 M = Vapor Molecular Weight (lb/lb-mole)
 Q = Volume (1,000 gal/yr)
 T = Temperature (°R)

Liquid Materials/Products Mixing/Reaction: The following equation shall be used to determine the VOC emissions from the mixing and reaction processes involving VOC containing material:

$$E_{VOC} = \left[\left(\frac{\Sigma(P_x)_{T1}}{14.7 - \Sigma(P_x)_{T1}} \right) + \left(\frac{\Sigma(P_x)_{T2}}{14.7 - \Sigma(P_x)_{T2}} \right) \right] / 2 * \Delta n * M_a * CYC$$

Where,

E_{voc} = VOC Emissions (lb/yr)
 $\Sigma(P_x)_{T1}$ = initial partial pressure of each VOC species (x) in the vessel headspace at the initial temperature (T1) (psia)
 $\Sigma(P_x)_{T2}$ = final partial pressure of each VOC species (x) in the vessel headspace at the final temperature (T2) (psia)
 Δn = number of lb-moles of gas displaced (lb-mole/batch)
 M_a = average vapor molecular weight (lb/lb-mole)
 CYC = number of cycles per year (batches/yr)

Dry Materials/Products Loading/Unloading:

Pigment

$EF = 2 \text{ lb PM/ton of pigment processed}$ (AP-42, Table 6.7.1)

Salt

$EF = 0.13 \text{ lb PM/ton of salt}$

(Derived from AP-42, Table 11.19.1-1 using a controlled emission factor of 0.0013 lb/ton and a control efficiency of 99%)

All processes at the facility that emit PM within the building will have an Enclosure Control Factor of 70%.

Combustion emission factors:

Natural Gas Combustion AP-42, Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4

Working and Breathing Losses from Storage Tanks:

Liquid Storage Tanks AP-42, Chapter 7 (Tanks 4.0d)

7. Insignificant Activities

Equipment	Qty	PTE (ton/yr)	Regulation Basis
Natural Gas Boiler	1	3.59 (NO _x)	Regulation 1.02, Appendix A
Indirect Heat Exchanger ²	1	0.12 (NO _x)	Regulation 1.02, Appendix A
Propane Internal Combustion Engines (Industrial Trucks)	8	0.8 (NO _x)	Regulation 1.02, Appendix A
Emergency Relief Vents	5	0.0	Regulation 1.02, Appendix A
Laboratory Hoods	3	0.279 (VOC)	Regulation 1.02, Appendix A
Parts Washer equipped with secondary reservoirs ³	1	0.762 (VOC)	Regulation 1.02, Appendix A
Baker/Perkins Flusher	1	0.039 (VOC)	Regulation 1.02, Section 1.38
Custom Flusher (5 gal)	1	1.95 x 10 ⁻³ (VOC)	Regulation 1.02, Section 1.38
Custom Flusher (2 gal)	1	7.81 x 10 ⁻⁴ (VOC)	Regulation 1.02, Section 1.38
DH Hammermill	1	0.377 (PM ₁₀)	Regulation 1.02, Section 1.38
30" SWECO Screener	1	0.292 (PM ₁₀)	Regulation 1.02, Section 1.38
Roll Mills	3	0.0	Regulation 1.02, Section 1.38
Post Mixer	1	0.0	Regulation 1.02, Section 1.38
Stainless Steel Reactor	1	0.051 (VOC)	Regulation 1.02, Section 1.38
Glass Lined Reactor	1	0.051 (VOC)	Regulation 1.02, Section 1.38

² The capacity of the indirect heat exchanger is 0.27 MMBTU/hr. Therefore, it is not subject to Regulation 7.06 because it is less than 1 MMBTU/hr.

³ The parts washer in this emission unit is subject to Regulation 6.18. The owner or operator is required to operate and maintain the parts washer according to the requirements of this regulation.

Equipment	Qty	PTE (ton/yr)	Regulation Basis
Rotary Dryer with Condenser	1	0.788 (PM ₁₀)	Regulation 1.02, Section 1.38
Oil Warmer	1	0.0	Regulation 1.02, Section 1.38
Dyno Horizontal Media Mill	2	0.377 (PM ₁₀)	Regulation 1.02, Section 1.38
Neutralization Tanks	2	1.88 x 10 ⁻⁵ (VOC)	Regulation 1.02, Section 1.38
Wastewater Clarifiers	2	0.106 (VOC)	Regulation 1.02, Section 1.38
Sludge Tank	1	6.37 x 10 ⁻⁵ (VOC)	Regulation 1.02, Section 1.38
Filter Press #12	1	0.056 (VOC)	Regulation 1.02, Section 1.38
Various Filter Presses	9	0.056 (VOC)	Regulation 1.02, Section 1.38
Torit Model 84	2	< 1 tpy each	Regulation 1.02, Appendix A
Torit Model VS550	3	< 1 tpy each	Regulation 1.02, Appendix A
Torit Model V1550	1	< 1 tpy	Regulation 1.02, Appendix A
Torit Model 75/80	1	< 1 tpy	Regulation 1.02, Appendix A
Torit Model 80CAB	1	< 1 tpy	Regulation 1.02, Appendix A

1. Insignificant activities identified in District Regulation 1.02, Appendix A, may be subject to size or production rate disclosure requirements.
2. Insignificant activities identified in District Regulation 1.02, Appendix A shall comply with generally applicable requirements.
3. The owner or operator shall annually submit an updated list of insignificant activities that occurred during the preceding year, with the compliance certification due April 15th.
4. Emissions from Insignificant Activities shall be reported in conjunction with the reporting of annual emissions of the facility as required by the District.
5. The owner or operator may elect to monitor actual throughputs for each of the insignificant activities and calculate actual annual emissions, or use Potential to Emit (PTE) as the annual emissions for each piece of equipment.
6. The District has determined that no monitoring, recordkeeping, or reporting requirements apply to the insignificant activities listed, except for the equipment that has an applicable regulation and permitted under an insignificant activity (IA) unit.