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	<b>Processed By</b> MP03	<b>Checked By</b>

<b>DE MINIMIS SIGNIFICANT TITLE V PERMIT REVISION PERMIT TO CONSTRUCT EVALUATION</b>
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**LEGAL OWNER OR OPERATOR:** IPS Corporation

**FACILITY ID:** 800367

**EQUIPMENT LOCATION:** 17109 S. Main St  
Gardena, CA 90248

**MAILING ADDRESS:** PO Box 379  
Gardena, CA 90248

**EQUIPMENT DESCRIPTION:**

**APPLICATION NO. 482764**

DE MINIMIS SIGNIFICANT TITLE V PERMIT REVISION

**APPLICATION NO. 482765**

STATION NO. 1, CONTAINER-FILLING, SIMPLEX AIR, MODEL V-800, 3'-0" W. X 7'-5" L. X 5'-0" H., WITH EIGHT NOZZLES.

**APPLICATION NO. 482766**

STATION NO. 10, CONTAINER-FILLING, SIMPLEX AIR, MODEL V-400, 3'-0" W. X 4'-7" L. X 5'-0" H., WITH 4 NOZZLES.

**APPLICATION NO. 482767**

STATION NO. 11, CONTAINER-FILLING, SIMPLEX AIR, MODEL V-400, 3'-0" W. X 4'-7" L. X 5'-0" H., WITH 4 NOZZLES.

**APPLICATION NO. 482768**

AIR POLLUTION CONTROL SYSTEM CONSISTING OF:

1. REGENERATIVE THERMAL OXIDIZER, ADWEST TECHNOLOGIES, MODEL 6.0 RTO95, WITH A MAXON KINEMAX 3G NATURAL GAS-FIRED BURNER, 1,734,000 BTU PER HOUR, A NATURAL GAS INJECTION SYSTEM, A 3-H.P. COMBUSTION AIR BLOWER, TWO

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COMBUSTION CHAMBERS, 250 CU. FT. TOTAL VOLUME, A FLOW DIVERTER VALVE, AND TWO CERAMIC BEDS, 5'-0" W. X 17'-8" L. X 2'-10" H. EACH.

2. EXHAUST SYSTEM CONSISTING OF:

A. FILLING ROOM PERMANENT TOTAL ENCLOSURE (PTE), 79'-0" W. X 29'-0" L. X 17'-0" H. OVERALL, ENCOMPASSING THREE CONTAINER FILLING STATIONS NOS. 1, 10 AND 11.

B. 25-H.P. BLOWER WITH A 2'-4" DIA. X 25'-0" H. EXHAUST STACK.

**BACKGROUND:**

IPS Corp. is a Title V (Group B), non-RECLAIM facility. The proposed permitting actions comprise a De Minimis Significant Revision to their Title V permit since there will be a slight increase in emissions due to combustion of natural gas in the oxidizer. IPS is a manufacturer of plastic adhesives and solvent cements.

IPS has submitted this application package for construction of a new regenerative thermal oxidizer and an increase in throughput for filling stations #1, #10, and #11. The filling stations are currently operating under PO F97858, F97859, and F97860. The current applications were received on 5/16/08.

IPS has received one NOV within the last five calendar years. The NOV was for failing to vent several mixers to associated air pollution control equipment. The NOV was resolved with the District Prosecutor's Office. There is no record of any NCs or complaints for this facility within the past five years.

**PROCESS DESCRIPTION:**

IPS is proposing to install a regenerative thermal oxidizer (RTO) to control emissions from three existing container filling stations, #1, #10, and #11. The new RTO will be installed at the Broadway Street location where the existing container filling stations are currently located. The lines will be used to package primers and adhesives manufactured in the mixing area. The room where stations #1, #10, and #11 are located will be vented in its entirety to the RTO. The room (enclosure) will meet the PTE requirements of EPA Method 204.

The RTO consists of a reinforced, insulated dual chamber filled with low pressure drop ceramic heat exchanger media (saddles). The gas flow is automatically controlled by a valve mechanism which changes the direction of the gas flow at regular intervals via an integral PLC system. An external burner is used only for rapid initial cold startup, typically 1 hour. Only one RTO fan is needed for normal operations (no purge or combustion air blowers).

The VOC-laden process air enters a porous bed filled with high temperature ceramic heat transfer media. The air is preheated by bed #1 to a maximum temperature, passes through a central combustion chamber where the hydrocarbons are oxidized to carbon dioxide and water vapor, and then exits a second bed where heat is transferred from the hot air back into the bed. To avoid an uneven temperature distribution in the RTO, the gas flow direction is changed automatically at regular intervals by the control mechanism to maintain even temperature profiles between the dual ceramic media chambers. Natural gas may be injected into the

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combustion chamber to maintain a temperature of 1500 °F; the burner will be used only for initial start-up. NOx emissions due to natural gas injection are not expected to exceed 2 ppm.

The manufacturer provides a 98% destruction guarantee for this equipment.

**EMISSION CALCULATIONS:**

A source test (with an approved test protocol) was conducted on line #4 on November 4, 2007. The product tested was a high VOC primer. The source test report resulted in a weighted (for cement and primer production) emission factor of 0.017 lbs VOC emitted per gallon of material (cement OR primer) packaged. This factor will be used for estimating emissions from the new lines.

Control efficiencies of 100% capture and 98% destruction will be used. The permit will be conditioned to require that the Permanent Total Enclosure meet EPA 204 requirements. The destruction efficiency will be confirmed with a source test since it is higher than the standard 95% destruction efficiency for this type of control equipment.

*Container filling emissions*

Throughput: 300,000 gal/mo (total)  
Schedule: 18 hrs/day, 6 days/week  
Emission factor: 0.017 lbs VOC/gal  
Control efficiency: 98%

$$R1 = (300,000 \text{ gal/mo})(0.017 \text{ lbs VOC/gal})(\text{mo}/4.33 \text{ week})(\text{week}/6 \text{ day})(\text{day}/18 \text{ hr})/3 = 3.64 \text{ lbs/hr per station}$$

$$R2 = (3.64 \text{ lbs/hr})(0.02 \text{ lbs/lbs}) = 0.07 \text{ lbs/hr} = 1.31 \text{ lbs/day per station}$$

$$\text{Annual} = 408 \text{ lbs/yr per station}$$

$$30\text{-Day} = (0.07 \text{ lbs/hr})(18 \text{ hrs/day})(6 \text{ day/week})(4.33 \text{ week/mo})(\text{mo}/30 \text{ day}) = 1.09 \text{ lbs/day}$$

*Combustion Emissions from RTO Burner*

The burner will be supplied with natural gas for up to an hour per day for rapid cold-start purposes only. Based on 1 hr/day operation, the burner combustion emissions are as follows:

Substance	lb/mmcf	mmcf/hr	R, lbs/hr	R, lbs/day	R, lbs/yr	30-Day
ROG	7	0.001651	0.012	0.012	3.61	0.01
NOx	76.8	0.001651	0.127	0.127	39.57	0.11
SOx	0.6	0.001651	0.001	0.001	0.31	0.001
CO	35	0.001651	0.058	0.058	18.03	0.05
PM10	7.5	0.001651	0.012	0.012	3.86	0.01

*Afterburner Evaluation*

Inlet CFM = 6,000 ft<sup>3</sup>/min

Inlet Temp = 70 °F

Outlet Temp = 160 °F

Combustion Temp = 1500 °F (min)

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$$\text{Heat Recovery} = (1500 - 160)/(1500 - 70) * 100 = 93.71\%$$

$$\text{Inlet air temp} = (1500 \text{ }^\circ\text{F})(0.9371) = 1406 \text{ }^\circ\text{F}$$

$$\text{Enthalpy @ } 1500 \text{ }^\circ\text{F} = 28.24 \text{ Btu/scf}$$

$$1400 \text{ }^\circ\text{F} = 26.13 \text{ Btu/scf}$$

$$\text{Heat required} = (6,000 \text{ ft}^3/\text{min})(60 \text{ min/hr})(28.24 - 26.13)(\text{Btu/scf}) = 759,600 \text{ Btu/hr}$$

The RTO burner is 1,734,000 Btu/hr; hence it will take approximately a half hour to reach temperature from cold start-up.

#### *Retention Time*

$$\text{Combustion chamber: } 250 \text{ ft}^3$$

$$\text{Natural gas required: } (1,734,000 \text{ Btu/hr})(\text{ft}^3/1050 \text{ Btu}) = 1,651 \text{ ft}^3/\text{hr}$$

$$\text{Combustion air required: } (1,651 \text{ ft}^3/\text{hr})(10.36 \text{ ft}^3 \text{ air/ft}^3 \text{ NG}) = 17,109 \text{ ft}^3 \text{ air/hr}$$

$$\text{Gas volume: } (6,000 \text{ ft}^3/\text{min})(60 \text{ min/hr}) + 17,109 \text{ ft}^3/\text{hr} + 1,651 \text{ ft}^3/\text{hr} = 378,760 \text{ ft}^3/\text{hr}$$

$$\text{Gas volume @ } 1500 \text{ }^\circ\text{F: } (378,760 \text{ ft}^3/\text{hr})(\text{hr}/60 \text{ min})(1960 \text{ }^\circ\text{R}/530 \text{ }^\circ\text{R}) = 23,335 \text{ ft}^3/\text{min} = 389.1 \text{ ft}^3/\text{sec}$$

#### *Residence Time*

$$\text{Combustion chamber: } 250 \text{ ft}^3$$

$$\text{Residence time: } (250 \text{ ft}^3)/(389.1 \text{ ft}^3/\text{sec}) = 0.64 \text{ sec}$$

The residence time exceeds the minimum recommended residence time of 0.5 seconds for a thermal oxidizer operating at 1400 °F.

#### *Toxics Emissions*

MEK Emissions:

$$\text{Throughput: } 300,000 \text{ gal/mo (total)}$$

$$\text{Schedule: } 18 \text{ hrs/day, 6 days/week}$$

$$\text{Emission factor: } 0.017 \text{ lbs VOC/gal}$$

$$\text{Control efficiency: } 98\%$$

$$\text{MEK content: } 0.25 \text{ lbs/lbs}$$

$$R1 = (300,000 \text{ gal/mo})(0.017 \text{ lbs VOC/gal})(\text{mo}/4.33 \text{ week})(\text{week}/6 \text{ day})(\text{day}/18 \text{ hr})(0.25 \text{ lbs/lbs})$$

$$R1 = 2.73 \text{ lbs/hr}$$

$$R2 = (2.73 \text{ lbs/hr})(1 - 0.98 \text{ lbs/lbs}) = 0.0545 \text{ lbs/hr} = 0.98 \text{ lbs/day}$$

$$\text{Annual} = (300,000 \text{ gal/mo})(12 \text{ mo/yr})(0.017 \text{ lbs VOC/gal})(0.25 \text{ lbs/lbs})(1 - 0.98) = 306 \text{ lbs/yr}$$

$$30\text{-Day} = (0.0545 \text{ lbs/hr})(18 \text{ hrs/day})(6 \text{ day/week})(4.33 \text{ week/mo})(\text{mo}/30 \text{ day}) = 0.85 \text{ lbs/day}$$

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*Toxics Emissions due to Combustion*

Toxics Emissions	EF, lbs/mmcf	NG, mmcf/hr	R1, lbs/hr	Screening, lbs/hr	R1, lbs/yr	Screening, lbs/yr	30-Day, lbs/day
Benzene	0.008	0.001651	1.32E-05	0.739	4.12E-03	1.14	1.14E-05
Formaldehyde	0.017	0.001651	2.81E-05	0.05	8.76E-03	5.51	2.43E-05
PAH (ex naphthalene)	0.0001	0.001651	1.65E-07	NA	5.15E-05	0.002	1.43E-07
Naphthalene	0.0003	0.001651	4.95E-07	NA	1.55E-04	298	4.29E-07
Acetaldehyde	0.0043	0.001651	7.10E-06	NA	2.22E-03	12.25	6.15E-06
Acrolein	0.0027	0.001651	4.46E-06	0.0001	1.39E-03	1.98	3.86E-06
Propylene	0.731	0.001651	1.21E-03	NA	3.77E-01	99200	1.05E-03
Toluene	0.0366	0.001651	6.04E-05	18.5	1.89E-02	9920	5.23E-05
Xylenes	0.0272	0.001651	4.49E-05	11	1.40E-02	23100	3.89E-05
Ethyl benzene	0.0095	0.001651	1.57E-05	NA	4.89E-03	66100	1.36E-05
Hexane	0.0063	0.001651	1.04E-05	NA	3.25E-03	231000	9.01E-06

**RULE EVALUATION:**

**Rule 212(c)(1)** – There are no schools within 1000 ft. Public notice is not required pursuant to this section.

**Rule 212(c)(2)** – The emissions from these permitting actions do not exceed the thresholds specified by this section of the rule. Public notice is not required.

**Rule 212(c)(3)** – The MICR is below the levels specified by this section of the rule. Public notice is not required.

**Rule 212(g)** – There is an ROG emissions decrease due to this permitting action; increases of combustion contaminants are negligible. Public notice is not required.

**Rule 401** – No visible emissions are expected from well maintained equipment with proper operation; compliance with this rule is expected.

**Rule 402** – The proper operation of well maintained equipment is not expected to cause a public nuisance; compliance with this rule is expected.

**Rule 442** – The filling lines will be vented to an RTO with 98% capture and control efficiency; compliance with this rule is expected.

**Rule 1168** – Continued compliance with the VOC limits of this rule is expected.

**Rule 1171** – Continued compliance with the solvent requirements of this rule is expected.

**Rule 1303(a)(1)** – There is an increase of VOC uncontrolled emissions. However, the filling stations will be vented to an RTO which satisfies BACT requirements and results in an overall decrease of VOC emissions. Emissions due to combustion of natural gas in the RTO are negligible. Continued compliance is expected.

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**Rule 1303(b)(1), (2)** – There is an increase in throughput and uncontrolled VOC emissions; however, the emissions will be vented to control so there is a *net reduction* in emissions of 18 lbs/day. Emissions due to combustion of natural gas in the RTO are negligible. Offset and modeling requirements do not apply.

**Rule 1401** – MEK is a toxic air contaminant as defined by this rule and is used in several of the materials processed in this equipment. A Tier 1 risk assessment for MEK and toxics due to combustion was performed and shows that the risk is well below the screening levels defined by this rule. Compliance with the rule is expected.

**Reg. XXX** – The above revision was classified a De Minimis Significant permit revision. All necessary monitoring conditions required by this regulation are already in place with the current permit conditions and no relaxation of the requirements is expected. Compliance with this regulation is expected.

Revision No.	AN	Type	PM10 Increase	ROG Increase
1	431302	Minor	0	0
2	454110	Minor	0	0
3	475026	De Minimis	0	+5
4	456673	De Minimis	0	0
5	482764	Minor	0	-18

**RECOMMENDATION:**

Issue Permits to Construct for the subject applications after EPA 45-day review period.