



**PERMIT**  
**Under the Environmental Conservation Law (ECL)**

**IDENTIFICATION INFORMATION**

Permit Type: Air State Facility  
Permit ID: 3-1328-00422/00001  
Effective Date: 10/26/2009                      Expiration Date: No expiration date

Permit Issued To: SPECTRAWATT INC  
2070 ST RTE 52  
B/334 ZIP 23A  
HOPEWELL JUNCTION, NY 12533

Contact: RICK J HAUG  
SPECTRAWATT INC  
2070 ST RTE 52 B/334 Z/23A  
HOPEWELL JUNCTION, NY 12533  
(845) 559-3998

Facility: SPECTRAWATT  
2070 ST RTE 52|B/334, ZIP 23A  
HOPEWELL JUNCTION, NY 12533

Description:

SpectraWatt Inc is located in Dutchess County, NY. The facility operates two 60 MegaWatt Photovoltaic Device Manufacturing lines, which include the following processes;

Texturization Etch, Spray-On Diffusion, Selective Emitter, Oxide Etch, Silicon Nitride Deposition, Screen Printing & Metalization, De-Bowing (no emissions associated with this process), Laser Edge Isolation, and Equipment & Parts Clean (Exempt in accordance with 6 NYCRR 201-3.2c(40)).

Associated Air Pollution Abatement Systems consist of;  
VOC Oxidizer (Regenerative Thermal Oxidizer System manufactured by Adwest Technologies [RTOV1]), Acid Scrubber [0ACID], NOx Scrubber [00NOX], Point-of-use scrubbers [POU11, POU21], and HEPA Filters incorporated in the laser equipment [HEPA1, HEPA2, HEPA3 HEPA4, HEPA5, HEPA6,].

Facility emissions are below major stationary source threshold and therefore classified as a natural minor. The facility is subject to monitoring and reporting requirements under 6 NYCRR Parts 201 and 212. The Standard Industrial Classification is 3674 – Semiconductors and related devices.



By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, the General Conditions specified and any Special Conditions included as part of this permit.

Permit Administrator:           KENNETH R GRZYB  
  NYSDEC REGION 3  
  21 S PUTT CORNERS RD  
  NEW PALTZ, NY 12561

Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_



### Notification of Other State Permittee Obligations

**Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification**

The permittee expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the compliance permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in any compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

**Item B: Permittee's Contractors to Comply with Permit**

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

**Item C: Permittee Responsible for Obtaining Other Required Permits**

The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

**Item D: No Right to Trespass or Interfere with Riparian Rights**

This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.



## **LIST OF CONDITIONS**

### **DEC GENERAL CONDITIONS**

#### **General Provisions**

- Facility Inspection by the Department
- Relationship of this Permit to Other Department Orders and Determinations
- Applications for permit renewals, modifications and transfers
- Permit modifications, suspensions or revocations by the Department

#### **Facility Level**

- Submission of application for permit modification or renewal-REGION 3 HEADQUARTERS



**DEC GENERAL CONDITIONS**  
**\*\*\*\* General Provisions \*\*\*\***  
**GENERAL CONDITIONS - Apply to ALL Authorized Permits.**

**Condition 1: Facility Inspection by the Department**  
**Applicable State Requirement: ECL 19-0305**

**Item 1.1:**

The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71-0301 and SAPA 401(3).

**Item 1.2:**

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

**Item 1.3:**

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

**Condition 2: Relationship of this Permit to Other Department Orders and Determinations**  
**Applicable State Requirement: ECL 3-0301 (2) (m)**

**Item 2.1:**

Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

**Condition 3: Applications for permit renewals, modifications and transfers**  
**Applicable State Requirement: 6 NYCRR 621.11**

**Item 3.1:**

The permittee must submit a separate written application to the Department for renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing.

**Item 3.2:**

The permittee must submit a renewal application at least 180 days before expiration of permits for Title V Facility Permits, or at least 30 days before expiration of permits for State Facility Permits.

**Item 3.3:**

Permits are transferrable with the approval of the department unless specifically prohibited by the statute, regulation or another permit condition. Applications for permit transfer should be submitted prior to actual transfer of ownership.

**Condition 4: Permit modifications, suspensions or revocations by the Department**



**Applicable State Requirement: 6 NYCRR 621.13**

**Item 4.1:**

The Department reserves the right to modify, suspend, or revoke this permit in accordance with 6NYCRR Part 621. The grounds for modification, suspension or revocation include:

- a) materially false or inaccurate statements in the permit application or supporting papers;
- b) failure by the permittee to comply with any terms or conditions of the permit;
- c) exceeding the scope of the project as described in the permit application;
- d) newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;
- e) noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

**\*\*\*\* Facility Level \*\*\*\***

**Condition 5: Submission of application for permit modification or renewal-REGION 3 HEADQUARTERS**

**Applicable State Requirement: 6 NYCRR 621.6 (a)**

**Item 5.1:**

Submission of applications for permit modification or renewal are to be submitted to:  
NYSDEC Regional Permit Administrator  
Region 3 Headquarters  
Division of Environmental Permits  
21 South Putt Corners Road  
New Paltz, NY 12561-1696  
(845) 256-3054



**Permit Under the Environmental Conservation Law (ECL)**

**ARTICLE 19: AIR POLLUTION CONTROL - AIR STATE FACILITY  
PERMIT**

**IDENTIFICATION INFORMATION**

Permit Issued To: SPECTRAWATT INC  
2070 ST RTE 52  
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HOPEWELL JUNCTION, NY 12533

Facility: SPECTRAWATT  
2070 ST RTE 52/B/334, ZIP 23A  
HOPEWELL JUNCTION, NY 12533

Authorized Activity By Standard Industrial Classification Code:  
3674 - SEMICONDUCTORS & RELATED DEVICES

Permit Effective Date: 10/26/2009  
date.

Permit Expiration Date: No expiration  
date.



## LIST OF CONDITIONS

### FEDERALLY ENFORCEABLE CONDITIONS

#### Facility Level

- 1 6 NYCRR 212.4 (a): Compliance Demonstration
- 2 6 NYCRR 212.4 (a): Compliance Demonstration
- 3 6 NYCRR 212.4 (a): Compliance Demonstration
- 4 6 NYCRR 212.4 (a): Compliance Demonstration
- 5 6 NYCRR 212.4 (c): Compliance Demonstration
- 6 6 NYCRR 212.6: Compliance Demonstration

### STATE ONLY ENFORCEABLE CONDITIONS

#### Facility Level

- 7 ECL 19-0301: Contaminant List
- 8 6 NYCRR 201-1.4: Unavoidable noncompliance and violations
- 9 6 NYCRR Subpart 201-5: Emission Unit Definition
- 10 6 NYCRR 211.2: Air pollution prohibited

#### Emission Unit Level

- 11 6 NYCRR Subpart 201-5: Emission Point Definition By Emission Unit
- 12 6 NYCRR Subpart 201-5: Process Definition By Emission Unit



**FEDERALLY ENFORCEABLE CONDITIONS**

**\*\*\*\* Facility Level \*\*\*\***

**NOTIFICATION OF GENERAL PERMITTEE OBLIGATIONS**

**This section contains terms and conditions which are federally enforceable. Permittees may also have other obligations under regulations of general applicability**

**Item A: Sealing - 6 NYCRR 200.5**

The Commissioner may seal an air contamination source to prevent its operation if compliance with 6 NYCRR Chapter III is not met within the time provided by an order of the Commissioner issued in the case of the violation. Sealing means labeling or tagging a source to notify any person that operation of the source is prohibited, and also includes physical means of preventing the operation of an air contamination source without resulting in destruction of any equipment associated with such source, and includes, but is not limited to, bolting, chaining or wiring shut control panels, apertures or conduits associated with such source.

No person shall operate any air contamination source sealed by the Commissioner in accordance with this section unless a modification has been made which enables such source to comply with all requirements applicable to such modification.

Unless authorized by the Commissioner, no person shall remove or alter any seal affixed to any contamination source in accordance with this section.

**Item B: Acceptable Ambient Air Quality - 6 NYCRR 200.6**

Notwithstanding the provisions of 6 NYCRR Chapter III, Subchapter A, no person shall allow or permit any air contamination source to emit air contaminants in quantities which alone or in combination with emissions from other air contamination sources would contravene any applicable ambient air quality standard and/or cause air pollution. In such cases where contravention occurs or may occur, the Commissioner shall specify the degree and/or method of emission control required.

**Item C: Maintenance of Equipment - 6 NYCRR 200.7**

Any person who owns or operates an air contamination source which is equipped with an emission control device shall operate such device and keep it in a satisfactory state of maintenance and repair in accordance with ordinary and necessary practices, standards and procedures, inclusive of manufacturer's specifications, required to operate such device effectively.



**Item D: Unpermitted Emission Sources - 6 NYCRR 201-1.2**

If an existing emission source was subject to the permitting requirements of 6 NYCRR Part 201 at the time of construction or modification, and the owner and/or operator failed to apply for a permit for such emission source then the following provisions apply:

(a) The owner and/or operator must apply for a permit for such emission source or register the facility in accordance with the provisions of Part 201.

(b) The emission source or facility is subject to all regulations that were applicable to it at the time of construction or modification and any subsequent requirements applicable to existing sources or facilities.

**Item E: Emergency Defense - 6 NYCRR 201-1.5**

An emergency constitutes an affirmative defense to an action brought for noncompliance with emissions limitations or permit conditions for all facilities in New York State.

(a) The affirmative defense of emergency shall be demonstrated through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An emergency occurred and that the facility owner and/or operator can identify the cause(s) of the emergency;

(2) The equipment at the permitted facility causing the emergency was at the time being properly operated;

(3) During the period of the emergency the facility owner and/or operator took all reasonable steps to minimize levels of emissions that exceeded the emission standards, or other requirements in the permit; and

(4) The facility owner and/or operator notified the Department within two working days after the event occurred. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken.

(b) In any enforcement proceeding, the facility owner and/or operator seeking to establish the occurrence of an emergency has the burden of proof.

(c) This provision is in addition to any emergency or upset provision contained in any applicable requirement.



**Item F: Recycling and Salvage - 6 NYCRR 201-1.7**

Where practical, any person who owns or operates an air contamination source shall recycle or salvage air contaminants collected in an air cleaning device according to the requirements of 6 NYCRR.

**Item G: Prohibition of Reintroduction of Collected Contaminants to the Air - 6 NYCRR 201-1.8**

No person shall unnecessarily remove, handle, or cause to be handled, collected air contaminants from an air cleaning device for recycling, salvage or disposal in a manner that would reintroduce them to the outdoor atmosphere.

**Item H: Proof of Eligibility for Sources Defined as Exempt Activities - 6 NYCRR 201-3.2 (a)**

The owner and/or operator of an emission source or unit that is eligible to be exempt, may be required to certify that it operates within the specific criteria described in 6 NYCRR Subpart 201-3. The owner or operator of any such emission source must maintain all required records on-site for a period of five years and make them available to representatives of the Department upon request. Department representatives must be granted access to any facility which contains emission sources or units subject to 6 NYCRR Subpart 201-3, during normal operating hours, for the purpose of determining compliance with this and any other state and federal air pollution control requirements, regulations, or law.

**Item I: Proof of Eligibility for Sources Defined as Trivial Activities - 6 NYCRR 201-3.3 (a)**

The owner and/or operator of an emission source or unit that is listed as being trivial in 6 NYCRR Part 201 may be required to certify that it operates within the specific criteria described in 6 NYCRR Subpart 201-3. The owner or operator of any such emission source must maintain all required records on-site for a period of five years and make them available to representatives of the Department upon request. Department representatives must be granted access to any facility which contains emission sources or units subject to 6 NYCRR Subpart 201-3, during normal operating hours, for the purpose of determining compliance with this and any other state and federal air pollution control requirements, regulations, or law.

**Item J: Required Emission Tests - 6 NYCRR 202-1.1**

An acceptable report of measured emissions shall be submitted, as may be required by the Commissioner, to ascertain compliance or noncompliance with any air



pollution code, rule, or regulation. Failure to submit a report acceptable to the Commissioner within the time stated shall be sufficient reason for the Commissioner to suspend or deny an operating permit. Notification and acceptable procedures are specified in 6 NYCRR Subpart 202-1.

**Item K: Visible Emissions Limited - 6 NYCRR 211.3**

Except as permitted by a specific part of this Subchapter and for open fires for which a restricted burning permit has been issued, no person shall cause or allow any air contamination source to emit any material having an opacity equal to or greater than 20 percent (six minute average) except for one continuous six-minute period per hour of not more than 57 percent opacity.

**Item L: Open Fires - 6 NYCRR Part 215**

No person shall burn, cause, suffer, allow or permit the burning in an open fire of garbage, rubbish for salvage, or rubbish generated by industrial or commercial activities.

**Item M: Permit Exclusion - ECL 19-0305**

The issuance of this permit by the Department and the receipt thereof by the Applicant does not and shall not be construed as barring, diminishing, adjudicating or in any way affecting any legal, administrative or equitable rights or claims, actions, suits, causes of action or demands whatsoever that the Department may have against the Applicant for violations based on facts and circumstances alleged to have occurred or existed prior to the effective date of this permit, including, but not limited to, any enforcement action authorized pursuant to the provisions of applicable federal law, the Environmental Conservation Law of the State of New York (ECL) and Chapter III of the Official Compilation of the Codes, Rules and Regulations of the State of New York (NYCRR). The issuance of this permit also shall not in any way affect pending or future enforcement actions under the Clean Air Act brought by the United States or any person.

**Item N: Federally Enforceable Requirements - 40 CFR 70.6 (b)**

All terms and conditions in this permit required by the Act or any applicable requirement, including any provisions designed to limit a facility's potential to emit, are enforceable by the Administrator and citizens under the Act. The Department has, in this permit, specifically designated any terms and conditions that are not required under the Act or under any of its applicable requirements as being enforceable under only state regulations.



**FEDERAL APPLICABLE REQUIREMENTS**  
The following conditions are federally enforceable.

**Condition 1: Compliance Demonstration**  
Effective between the dates of 10/26/2009 and Permit Expiration Date

**Applicable Federal Requirement: 6 NYCRR 212.4 (a)**

**Item 1.1:**

The Compliance Demonstration activity will be performed for the facility:  
The Compliance Demonstration applies to:

Emission Unit: A-00001

Emission Point: 0ACID

Regulated Contaminant(s):

CAS No: 007647-01-0

HYDROGEN CHLORIDE

CAS No: 0NY100-00-0

HAP

**Item 1.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: INTERMITTENT EMISSION TESTING

Monitoring Description:

Emissions from the acid scrubber shall not exceed 0.52 lbs/hr of HCL. This stipulated mass emissions rate shall remain in effect as the governing limit until superseded by the required performance testing. Once degree of air cleaning is established, the governing limit shall be identified as greater than or equal to 90% capture.

Within 60 days after achieving the maximum line production rate, SpectraWatt Inc. shall conduct initial performance testing to determine acid gas (HCL) control efficiency associated with the scrubber (0ACID). The performance tests shall be conducted at the maximum design operating capacity of the unit being tested and/or other loads specified by NYSDEC.

At least 60 days prior to actual testing, the facility shall submit to NYSDEC a protocol detailing methods and procedures to be used during the performance stack testing.

The performance tests for acid gas emissions shall be conducted using applicable 40CFR Part 60, Appendix A methods.

Future performance tests may be required at the discretion of NYSDEC.



Results of emission testing must be submitted to NYSDEC within 60 days after completion of performance tests and shall include determination of mass emission rate and verification of 90% degree of air cleaning.

Operation during periods of start up, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

The Acid Scrubber operating parameters including pH and recirculation scrubber liquid flow shall be established as part of completing the initial performance testing. Each operating parameter shall become enforceable elements of the permit. To ensure proper operation, the facility shall maintain daily records of each operating parameter.

Upper Permit Limit: 0.52 pounds per hour

Reference Test Method: EPA Method

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: AVERAGING METHOD - SEE MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 2: Compliance Demonstration**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR 212.4 (a)**

**Item 2.1:**

The Compliance Demonstration activity will be performed for the facility:

The Compliance Demonstration applies to:

Emission Unit: A-00001

Emission Point: 00NOX

Process: TEX

Emission Source: 00NOX

Regulated Contaminant(s):

CAS No: 0NY210-00-0 OXIDES OF NITROGEN

**Item 2.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: INTERMITTENT EMISSION TESTING

Monitoring Description:

Emissions from the NOx Scrubber shall not exceed 2.18 lbs/hr. This stipulated mass emissions rate shall remain in effect as the governing limit until superceded by the required performance testing. Once degree of air cleaning is established, the governing limit shall be identified as greater than or equal to 90% capture.



Within 60 days after achieving the maximum line production rate, SpectraWatt Inc. shall conduct initial performance testing to determine NOx control efficiency associated with the scrubber (00NOX). The performance tests shall be conducted at the maximum design operating capacity of the unit being tested and/or other loads specified by NYSDEC.

At least 60 days prior to actual testing, the facility shall submit to NYSDEC a protocol detailing methods and procedures to be used during the performance stack testing.

The performance tests for NOx emissions shall be conducted using 40CFR Part 60, Appendix A, Method 7E.

Future performance tests may be required at the discretion of NYSDEC.

Results of emission testing must be submitted to NYSDEC within 60 days after completion of performance tests and shall include determination of mass emission rate and verification of 90% degree of air cleaning.

Operation during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

The NOx Scrubber operating parameters including pH and recirculation scrubber liquid flow shall be established as part of completing the initial performance testing. Each operating parameter shall become enforceable elements of the permit. To ensure proper operation, the facility shall maintain daily records of each operating parameter.

Upper Permit Limit: 2.18 pounds per hour

Reference Test Method: EPA Methods

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: AVERAGING METHOD - SEE MONITORING DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 3: Compliance Demonstration**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR 212.4 (a)**

**Item 3.1:**

The Compliance Demonstration activity will be performed for the facility:  
The Compliance Demonstration applies to:



Emission Unit: A-00001

Emission Point: 0ACID

Regulated Contaminant(s):

CAS No: 007664-39-3 HYDROGEN FLUORIDE

CAS No: 0NY100-00-0 HAP

**Item 3.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: INTERMITTENT EMISSION TESTING

Monitoring Description:

Emissions from the acid scrubber shall not exceed 0.12 lbs/hr of HF. This stipulated mass emissions rate shall remain in effect as the governing limit until superseded by the required performance testing. Once degree of air cleaning is established, the governing limit shall be identified as greater than or equal to 90% capture.

Within 60 days after achieving the maximum line production rate, SpectraWatt Inc. shall conduct initial performance testing to determine acid gas (HF) control efficiency associated with the scrubber (00ACID). The performance tests shall be conducted at the maximum design operating capacity of the unit being tested and/or other loads specified by NYSDEC.

At least 60 days prior to actual testing, the facility shall submit to NYSDEC a protocol detailing methods and procedures to be used during the performance stack testing.

The performance tests for acid gas emissions shall be conducted using applicable 40CFR Part 60, Appendix A methods.

Future performance tests may be required at the discretion of NYSDEC.

Results of emission testing must be submitted to NYSDEC within 60 days after completion of performance tests and shall include determination of mass emission rate and verification of 90% degree of air cleaning.

Operation during periods of start up, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

The Acid Scrubber operating parameters including pH and recirculation flow of scrubber liquid shall be established as part of completing the initial performance testing. Each operating parameter shall become enforceable elements



of the permit. To ensure proper operation, the facility shall maintain daily records of each operating parameter.

Upper Permit Limit: 0.12 pounds per hour

Reference Test Method: EPA Methods

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING

DESCRIPTION

Averaging Method: AVERAGING METHOD - SEE MONITORING

DESCRIPTION

Reporting Requirements: AS REQUIRED - SEE MONITORING DESCRIPTION

**Condition 4: Compliance Demonstration**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR 212.4 (a)**

**Item 4.1:**

The Compliance Demonstration activity will be performed for the facility:

The Compliance Demonstration applies to:

Emission Unit: A-00001

Process: SDI

Emission Point: 0SOLV

Emission Source: RTOV1

Emission Unit: A-00001

Process: SPM

Emission Point: 0SOLV

Emission Source: RTOV1

Regulated Contaminant(s):

CAS No: 0NY100-00-0 HAP

CAS No: 0NY998-00-0 VOC

**Item 4.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: MONITORING OF PROCESS OR CONTROL  
DEVICE PARAMETERS AS SURROGATE

Monitoring Description:

SpectraWatt Inc shall operate the Regenerative Thermal Oxidizer (RTOV1) at a minimum temperature of 1500 F to ensure a degree of air cleaning greater then or equal to 91%, in accordance with 6 NYCRR Subpart 212.9(b) Table 2.

Continuous monitors and data recorders are required to measure combustion and outlet temperatures. Continuous monitors must be operated at all times when the associated process equipment is operating except during any quality assurance and routine maintenance activities. Recording



shall be based on a six-minute average.

Thermal Oxidizers shall be energy efficient and operated in a satisfactory state of maintenance and repair in accordance with ordinary and necessary practices, standards, and procedures, inclusive of manufacturer's specifications. The Department reserves the right to require SpectraWatt Inc conduct future performance testing to verify capture and control efficiencies.

The facility shall keep record of the date, time and duration of all periods the RTO was not in operation during the normal operations of the equipment that it controls including startup/shutdown, malfunction or curtailment. Malfunction/maintenance events over 4 days shall require written notification to the Department within 30 days of repair/completion of maintenance. These notifications shall describe the date, time, duration, cause, corrective action and summary of emissions related to production activity during the downtime event.

Process Material: VOC's

Parameter Monitored: TEMPERATURE

Lower Permit Limit: 1500 degrees Fahrenheit

Monitoring Frequency: CONTINUOUS

Averaging Method: MINIMUM - NOT TO FALL BELOW STATED  
VALUE - SEE MONITORING DESCRIPTION

Reporting Requirements: UPON REQUEST BY REGULATORY AGENCY

**Condition 5: Compliance Demonstration**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable Federal Requirement:6 NYCRR 212.4 (c)**

**Item 5.1:**

The Compliance Demonstration activity will be performed for the facility:

The Compliance Demonstration applies to:

Emission Unit: A-00001	Emission Point: 00NOX
Emission Unit: A-00001	Emission Point: 0ACID
Emission Unit: A-00001	Emission Point: 0GEN1
Emission Unit: A-00001	Emission Point: 0GEN2
Emission Unit: A-00001	Emission Point: 0SOLV

Regulated Contaminant(s):  
CAS No: 0NY075-00-0 PARTICULATES

**Item 5.2:**

Compliance Demonstration shall include the following monitoring:



Monitoring Type: INTERMITTENT EMISSION TESTING

Monitoring Description:

SpectraWatt Inc shall not cause or allow emissions that exceed 0.050 grains of particulates per cubic foot of exhaust gas, expressed at standard conditions on a dry gas basis.

The facility shall maintain an updated comprehensive inventory record of emission points subject to this requirement as well as documentation of compliance as appropriate.

All records shall be available to the Department upon request.

The Department reserves the right to request future performance testing to verify compliance.

Parameter Monitored: PARTICULATES

Upper Permit Limit: 0.05 grains per dscf

Reference Test Method: EPA Method 5

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: MAXIMUM - NOT TO EXCEED STATED VALUE - SEE MONITORING DESCRIPTION

Reporting Requirements: ONCE / BATCH OR MONITORING OCCURRENCE

**Condition 6: Compliance Demonstration**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable Federal Requirement: 6 NYCRR 212.6**

**Item 6.1:**

The Compliance Demonstration activity will be performed for the facility:

The Compliance Demonstration applies to:

Emission Unit: A-00001	Emission Point: 00NOX
Emission Unit: A-00001	Emission Point: 0ACID
Emission Unit: A-00001	Emission Point: 0GEN1
Emission Unit: A-00001	Emission Point: 0GEN2
Emission Unit: A-00001	Emission Point: 0SOLV

**Item 6.2:**

Compliance Demonstration shall include the following monitoring:

Monitoring Type: MONITORING OF PROCESS OR CONTROL DEVICE PARAMETERS AS SURROGATE



Monitoring Description:

Average opacity, based on any six consecutive minutes, is limited to less than 20 percent, except only the emission of uncombined water.

The facility shall maintain a comprehensive inventory record of emission points subject to this requirement as well as documentation of compliance as appropriate. All records shall be available to the Department upon request.

The Department reserves the right to perform or require SpectraWatt Inc conduct a Method 9 opacity evaluation at any time during facility operation for the purpose to determining compliance.

Parameter Monitored: OPACITY

Upper Permit Limit: 20 percent

Monitoring Frequency: AS REQUIRED - SEE PERMIT MONITORING DESCRIPTION

Averaging Method: 6-MINUTE AVERAGE (METHOD 9)

Reporting Requirements: ONCE / BATCH OR MONITORING OCCURRENCE



**STATE ONLY ENFORCEABLE CONDITIONS**

**\*\*\*\* Facility Level \*\*\*\***

**NOTIFICATION OF GENERAL PERMITTEE OBLIGATIONS**

**This section contains terms and conditions which are not federally enforceable. Permittees may also have other obligations under regulations of general applicability**

**Item A: Public Access to Recordkeeping for Facilities With State Facility Permits - 6 NYCRR 201-1.10 (a)**

Where emission source owners and/or operators keep records pursuant to compliance with the operational flexibility requirements of 6 NYCRR Subpart 201-5.4(b)(1) , and/or the emission capping requirements of 6 NYCRR Subparts 201-7.2(d), 201-7.3(f), 201-7.3(g), 201-7.3(h)(5), 201-7.3(i) and 201-7.3(j), the Department will make such records available to the public upon request in accordance with 6 NYCRR Part 616 - Public Access to Records. Emission source owners and/or operators must submit the records required to comply with the request within sixty working days of written notification by the Department of receipt of the request.

**Item B: General Provisions for State Enforceable Permit Terms and Condition - 6 NYCRR Part 201-5**

Any person who owns and/or operates stationary sources shall operate and maintain all emission units and any required emission control devices in compliance with all applicable Parts of this Chapter and existing laws, and shall operate the facility in accordance with all criteria, emission limits, terms, conditions, and standards in this permit. Failure of such person to properly operate and maintain the effectiveness of such emission units and emission control devices may be sufficient reason for the Department to revoke or deny a permit.

The owner or operator of the permitted facility must maintain all required records on-site for a period of five years and make them available to representatives of the Department upon request. Department representatives must be granted access to any facility regulated by this Subpart, during normal operating hours, for the purpose of determining compliance with this and any other state and federal air pollution control requirements, regulations or law.

**STATE ONLY APPLICABLE REQUIREMENTS**

**The following conditions are state only enforceable.**



**Condition 7: Contaminant List**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable State Requirement:ECL 19-0301**

**Item 7.1:**

Emissions of the following contaminants are subject to contaminant specific requirements in this permit(emission limits, control requirements or compliance monitoring conditions).

CAS No: 007647-01-0  
Name: HYDROGEN CHLORIDE

CAS No: 007664-39-3  
Name: HYDROGEN FLUORIDE

CAS No: 0NY075-00-0  
Name: PARTICULATES

CAS No: 0NY100-00-0  
Name: HAP

CAS No: 0NY210-00-0  
Name: OXIDES OF NITROGEN

CAS No: 0NY998-00-0  
Name: VOC

**Condition 8: Unavoidable noncompliance and violations**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable State Requirement:6 NYCRR 201-1.4**

**Item 8.1:**

At the discretion of the commissioner a violation of any applicable emission standard for necessary scheduled equipment maintenance, start-up/shutdown conditions and malfunctions or upsets may be excused if such violations are unavoidable. The following actions and recordkeeping and reporting requirements must be adhered to in such circumstances.

- (a) The facility owner and/or operator shall compile and maintain records of all equipment maintenance or start-up/shutdown activities when they can be expected to result in an exceedance of any applicable emission standard, and shall submit a report of such activities to the commissioner's representative when requested to do so in writing or when so required by a condition of a permit issued for the corresponding air contamination source except where conditions elsewhere in this permit which contain more stringent reporting and notification provisions for an applicable requirement, in which case they supercede those stated here. Such reports shall describe why the violation was unavoidable and shall include the time, frequency and duration of the maintenance and/or start-up/shutdown activities and the identification of air contaminants, and the estimated emission rates. If a facility owner and/or operator is subject to continuous stack monitoring and quarterly reporting requirements, he need not submit reports for equipment maintenance or start-up/shutdown for the facility to the commissioner's representative.



(b) In the event that emissions of air contaminants in excess of any emission standard in 6 NYCRR Chapter III Subchapter A occur due to a malfunction, the facility owner and/or operator shall report such malfunction by telephone to the commissioner's representative as soon as possible during normal working hours, but in any event not later than two working days after becoming aware that the malfunction occurred. Within 30 days thereafter, when requested in writing by the commissioner's representative, the facility owner and/or operator shall submit a written report to the commissioner's representative describing the malfunction, the corrective action taken, identification of air contaminants, and an estimate of the emission rates. These reporting requirements are superceded by conditions elsewhere in this permit which contain reporting and notification provisions for applicable requirements more stringent than those above.

(c) The Department may also require the owner and/or operator to include in reports described under (a) and (b) above an estimate of the maximum ground level concentration of each air contaminant emitted and the effect of such emissions depending on the deviation of the malfunction and the air contaminants emitted.

(d) In the event of maintenance, start-up/shutdown or malfunction conditions which result in emissions exceeding any applicable emission standard, the facility owner and/or operator shall take appropriate action to prevent emissions which will result in contravention of any applicable ambient air quality standard. Reasonably available control technology, as determined by the commissioner, shall be applied during any maintenance, start-up/shutdown or malfunction condition subject to this paragraph.

(e) In order to have a violation of a federal regulation (such as a new source performance standard or national emissions standard for hazardous air pollutants) excused, the specific federal regulation must provide for an affirmative defense during start-up, shutdowns, malfunctions or upsets.

**Condition 9: Emission Unit Definition**  
**Effective between the dates of 10/26/2009 and Permit Expiration Date**

**Applicable State Requirement:6 NYCRR Subpart 201-5**

**Item 9.1:**

The facility is authorized to perform regulated processes under this permit for:

Emission Unit: A-00001

Emission Unit Description:

Photovoltaic Production; Two 60 MegaWatt Photovoltaic Device Manufacturing lines with associated processes (Texturization Etch, Spray-On Diffusion, Selective Emitter, Oxide Etch, Silicon Nitride Deposition, Screen Printing & Metalization, De-Bowing (no emissions associated with this process), Laser Edge Isolation, and Equipment & Parts Clean (Exempt in accordance with 6 NYCRR 201-3.2c(40)). There are a total of five emission points [Scrubbed NOx exhaust(00NOX), Scrubbed Acid exhaust (0ACID), Regenerative Thermal Oxidizer (RTOV1) exhaust and two unabated general exhaust systems (0GEN1 and 0GEN2)].

Building(s): 334

**Condition 10: Air pollution prohibited**



Effective between the dates of 10/26/2009 and Permit Expiration Date

Applicable State Requirement:6 NYCRR 211.2

**Item 10.1:**

No person shall cause or allow emissions of air contaminants to the outdoor atmosphere of such quantity, characteristic or duration which are injurious to human, plant or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life or property. Notwithstanding the existence of specific air quality standards or emission limits, this prohibition applies, but is not limited to, any particulate, fume, gas, mist, odor, smoke, vapor, pollen, toxic or deleterious emission, either alone or in combination with others.

\*\*\*\* Emission Unit Level \*\*\*\*

**Condition 11: Emission Point Definition By Emission Unit**  
Effective between the dates of 10/26/2009 and Permit Expiration Date

Applicable State Requirement:6 NYCRR Subpart 201-5

**Item 11.1:**

The following emission points are included in this permit for the cited Emission Unit:

Emission Unit: A-00001

Emission Point: 00NOX

Height (ft.): 80 Diameter (in.): 12  
NYTMN (km.): 4599.27 NYTME (km.): 598.344 Building: 334

Emission Point: 0ACID

Height (ft.): 79 Diameter (in.): 42  
NYTMN (km.): 4599.307 NYTME (km.): 598.323 Building: 334

Emission Point: 0GEN1

Height (ft.): 79 Diameter (in.): 36  
NYTMN (km.): 4599.278 NYTME (km.): 598.338 Building: 334

Emission Point: 0GEN2

Height (ft.): 79 Diameter (in.): 36  
NYTMN (km.): 4599.245 NYTME (km.): 598.362 Building: 334

Emission Point: 0SOLV

Height (ft.): 30 Diameter (in.): 24  
NYTMN (km.): 4599.153 NYTME (km.): 598.39 Building: 334

**Condition 12: Process Definition By Emission Unit**  
Effective between the dates of 10/26/2009 and Permit Expiration Date

Applicable State Requirement:6 NYCRR Subpart 201-5

**Item 12.1:**

This permit authorizes the following regulated processes for the cited Emission Unit:



Emission Unit: A-00001

Process: DBO

Process Description:

The De-Bowing (emission source IDs DEB11 & DEB21) step involves quickly cooling the wafer exiting the metalization furnace to prevent it from bowing. This process may be cryogenic involving liquid nitrogen. There are no anticipated emissions of any regulated air pollutants.

Emission Source/Control: DEB11 - Process

Emission Source/Control: DEB21 - Process

**Item 12.2:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: EQP

Process Description:

The equipment and parts clean hood (emission source ID IPA01) uses a small amount of Isopropanol (IPA) to wipe down parts and equipment. The IPA emissions are negligible and are routed to the general exhaust system.

Emission Source/Control: IPA01 - Process

**Item 12.3:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: LAS

Process Description:

The Laser Edge Isolation (emission source IDs LEI11, LEI12, LEI21 & LEI22) process involves an integrated laser system that utilizes a laser to isolate the junctions on the back surface of the wafer. There is a small amount of particulate matter emitted during the laser scribe phase which passes through a HEPA filter (99.97% filtration efficiency) prior to being exhausted through the general exhaust system

Emission Source/Control: HEPA1 - Control

Control Type: HIGH EFFICIENCY PARTICULATE AIR FILTER

Emission Source/Control: HEPA2 - Control

Control Type: HIGH EFFICIENCY PARTICULATE AIR FILTER

Emission Source/Control: HEPA3 - Control

Control Type: HIGH EFFICIENCY PARTICULATE AIR FILTER

Emission Source/Control: HEPA4 - Control



Control Type: HIGH EFFICIENCY PARTICULATE AIR FILTER

Emission Source/Control: LEI11 - Process

Emission Source/Control: LEI12 - Process

Emission Source/Control: LEI21 - Process

Emission Source/Control: LEI22 - Process

**Item 12.4:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: OET

Process Description:

The Oxide Etch tools (OXY11 & OXY21) are wet bench processes that remove the glass layer that forms during the diffusion step. The chemicals used during this process are DIW, HF, H2O2, and PV160. Chemical emissions from the Oxide Etch tools are routed to the abated acid system.

Emission Source/Control: 0ACID - Control

Control Type: PACKED GAS ABSORPTION SYSTEM, GAS SCRUBBER (GENERAL, NOT CLASSIFIED)

Emission Source/Control: OXY11 - Process

Emission Source/Control: OXY21 - Process

**Item 12.5:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: SDI

Process Description:

In the Diffusion process (emission source IDs DOP11, DOP12, DOP21, DOP22), phosphorus is injected into the wafer as a dopant. The diffusion mechanism will be a spray-on diffusion using a mixture of 2% Phosphoric Acid in Ethanol. Emissions from the spray-on diffusion step will be controlled by the VOC Abatement System. If any Phosphoric Acid is exhausted to the VOC system, it will be emitted as Phosphorous Pentoxide.

Emission Source/Control: RTOV1 - Control

Control Type: THERMAL OXIDATION

Emission Source/Control: DOP11 - Process

Emission Source/Control: DOP12 - Process



Emission Source/Control: DOP21 - Process

Emission Source/Control: DOP22 - Process

**Item 12.6:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: SEM

Process Description:

The Selective Emitter tools (emission source IDs SEL11 & SEL21) are a laser scribe process used to etch the glass layer formed in the diffusion step to improve cell efficiency. There is a small amount of particulate matter exhausted during the laser scribe phase which passes through a HEPA filter (99.97% filtration efficiency) prior to being emitted through the general exhaust system.

Emission Source/Control: HEPA5 - Control

Control Type: HIGH EFFICIENCY PARTICULATE AIR FILTER

Emission Source/Control: HEPA6 - Control

Control Type: HIGH EFFICIENCY PARTICULATE AIR FILTER

Emission Source/Control: SEL11 - Process

Emission Source/Control: SEL21 - Process

**Item 12.7:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: SND

Process Description:

The Silicon Nitride tools (emission source IDs SIN11 & SIN21) deposit an Antireflective Coating (ARC) onto the front surface of the wafer. This is accomplished using a thin-film deposition process within an automated cell. The cell is arranged in a serial or in-line layout. Anhydrous Ammonia and Silane are used in the process and any unreacted Ammonia and Silane are routed to point of use scrubbers (emission source IDs POU11 & POU21). These point of use scrubbers are peripherals of SIN11 and SIN21 and are directly attached to SIN11 and SIN21. The point of use scrubbers are installed specifically to prevent damage to and/or fouling of the facility ductwork and/or abated acid exhaust system. The emissions from the point of use scrubbers are then routed to the abated acid system. The point of use scrubbers are DAS Escape units manufactured by DAS Environmental Expert GmbH. The unused Silane and Ammonia from the process tools is fed into the center of a burner, and thermal decomposition of the waste gases occurs in the flame. In a subsequent scrubbing



process, the gaseous and solid compounds generated in the burner are removed with water.

Emission Source/Control: 0ACID - Control  
Control Type: PACKED GAS ABSORPTION SYSTEM, GAS  
SCRUBBER (GENERAL, NOT CLASSIFIED)

Emission Source/Control: POU11 - Control  
Control Type: WET SCRUBBER

Emission Source/Control: POU21 - Control  
Control Type: WET SCRUBBER

Emission Source/Control: SIN11 - Process

Emission Source/Control: SIN21 - Process

**Item 12.8:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: SPM

Process Description:

Screen Printing & Metalization (emission source IDs SPF11, SPF12, SPF21, & SPF22) is a three-step, in-line process that patterns the front side of the wafers with channels, the back side of the wafers with connection pads, and applies a uniform layer of aluminum and silver paste. The pastes contain organic solvents, e.g. Diethylene Glycol Monobutyl Ether, Terpeneol, Trimethylpentanediol Monoisobutyrate, and alpha-Terpeneol. After each screen printing process the wafers are sent to dryers. The Metalization or Firing process utilizes an in-line furnace that heats the wafer. Emissions from the screen printing process and from the dryers are routed to the VOC Abatement System.

Emission Source/Control: RTOV1 - Control  
Control Type: THERMAL OXIDATION

Emission Source/Control: SPF11 - Process

Emission Source/Control: SPF12 - Process

Emission Source/Control: SPF21 - Process

Emission Source/Control: SPF22 - Process

**Item 12.9:**

This permit authorizes the following regulated processes for the cited Emission Unit:

Emission Unit: A-00001

Process: TEX



Process Description:

Texturization Etch tools (emission source IDs TEX11 & TEX21) are a wet bench process designed to selectively etch the wafer's surface, maximizing light entrapment, and improving overall cell efficiency. The process utilizes Deionized Water (DIW), Hydrofluoric Acid (HF), Nitric Acid (HNO<sub>3</sub>), Hydrochloric Acid (HCl), Hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>), Potassium Hydroxide (KOH) and PV160 (alkyl ammonium hydroxide). The primary emissions from the Texturization Etch process are Oxides of Nitrogen, HF and HCl, which are exhausted to the NO<sub>x</sub> scrubber and to a lesser extent the abated acid system.

Emission Source/Control: 00NOX - Control

Control Type: 3R NOX REDUCTION TECHNOLOGY

Emission Source/Control: 0ACID - Control

Control Type: PACKED GAS ABSORPTION SYSTEM, GAS SCRUBBER (GENERAL, NOT CLASSIFIED)

Emission Source/Control: TEX11 - Process

Emission Source/Control: TEX21 - Process

New York State Department of Environmental Conservation

Permit ID: 3-1328-00422/00001

Facility DEC ID: 3132800422

