

PERMIT NO. 3674-015-0150-S-01-0
ISSUANCE DATE:



GEORGIA

DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

Air Quality Permit

In accordance with the provisions of the Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq and the Rules, Chapter 391-3-1, adopted pursuant to and in effect under that Act,

Facility Name: Hanwha Q Cells USA, Inc.
Facility Address: 751 Great Valley Pkwy.
White, Georgia 30184 (Bartow County)
Mailing Address: 751 Great Valley Pkwy.
White, Georgia 30184
Facility AIRS Number: 04-13-015-00150

is issued a Permit for the following:

The construction and operation of a photovoltaic module manufacturing facility.

This Permit is issued for the purpose of establishing practically enforceable emission limitations such that the facility will not be considered a major source with respect to Title V of the Clean Air Act Amendments of 1990.

This Permit is conditioned upon compliance with all provisions of The Georgia Air Quality Act, O.C.G.A. Section 12-9-1, et seq, the Rules, Chapter 391-3-1, adopted and in effect under that Act, or any other condition of this Permit.

This Permit may be subject to revocation, suspension, modification, or amendment by the Director for cause including evidence of noncompliance with any of the above; or for any misrepresentation made in Application No. 28696 dated January 23, 2023; any other applications upon which this Permit is based; supporting data entered therein or attached thereto; or any subsequent submittals or supporting data; or for any alterations affecting the emissions from this source.

This Permit is further subject to and conditioned upon the terms, conditions, limitations, standards, or schedules contained in or specified on the attached **8** pages.



Richard E. Dunn, Director
Environmental Protection Division

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1. General Requirements

- 1.1 At all times, including periods of startup, shutdown, and malfunction, the Permittee shall maintain and operate this source, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Division which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection or surveillance of the source.
- 1.2 The Permittee shall not build, erect, install, or use any article, machine, equipment or process the use of which conceals an emission which would otherwise constitute a violation of an applicable emission standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard that is based on the concentration of a pollutant in the gases discharged into the atmosphere.
- 1.3 The Permittee shall submit a Georgia Air Quality Permit application to the Division prior to the commencement of any modification, as defined in 391-3-1-.01(pp), which may result in air pollution, and which is not exempt under 391-3-1-.03(6). Such application shall be submitted sufficiently in advance of any critical date involved to allow adequate time for review, discussion, or revision of plans, if necessary. The application shall include, but not be limited to, information describing the precise nature of the change, modifications to any emission control system, production capacity and pollutant emission rates of the plant before and after the change, and the anticipated completion date of the change.
- 1.4 Unless otherwise specified, all records required to be maintained by this Permit shall be recorded in a permanent form suitable for inspection and submission to the Division and shall be retained for at least five (5) years following the date of entry.
- 1.5 In cases where conditions of this Permit conflict with each other for any particular source or operation, the most stringent condition shall prevail.

2. Allowable Emissions

- 2.1 The Permittee shall not discharge, or cause the discharge into the atmosphere, from the entire facility, volatile organic compounds (VOC) in an amount equal to or exceeding 100 tons during any twelve consecutive month period.
[Avoidance of 40 CFR Part 70]
- 2.2 The Permittee shall not discharge or cause the discharge into the atmosphere from the entire facility any single hazardous air pollutant (HAP) which is listed in Section 112 of the Clean Air Act, in an amount equal to or exceeding 10 tons during any twelve consecutive months, or any combination of such listed pollutants in amount equal to or exceeding 25 tons during any twelve consecutive months.
[Avoidance of 40 CFR Part 70]

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2.3 The Permittee shall not cause, let, suffer, permit, or allow emissions from any air contaminant source the opacity of which is equal to or greater than forty (40) percent.
[391-3-1-.02(2)(b)]

2.4 The Permittee shall not cause, let, permit, suffer, or allow the rate of emission from any source, particulate matter in total quantities equal to or exceeding the following rates:
[391-3-1-.02(2)(e)]

$E = 4.1 P^{0.67}$; for process input weight rate up to and including 30 tons per hour.

$E = 55P^{0.11} - 40$, for process input weight rate in excess of 30 tons per hour.

Where E = emission rate in pounds per hour, and
 P = process input weight rate in tons per hour.

2.5 The Permittee shall not cause, let, suffer, permit, or allow any emissions from any fuel burning equipment which:

a. For fuel burning equipment less than 10 MMBtu/hr. heat input — contain fly ash and/or other particulate matter in amounts equal to or exceeding 0.5 pounds per million BTU heat input.
[391-3-1-.02(2)(d)2.(i)]

b. For fuel burning equipment greater than or equal to 10 MMBtu/hr. heat input and equal to or less than 250 MMBtu/hr. heat input — contain fly ash and/or other particulate matter in amounts equal to or exceeding the rate derived from the equation noted below:
[391-3-1-.02(2)(d)2.(ii)]

$$P = 0.5(10/R)^{0.5}$$

Where P equals the allowable PM emission rate in pounds per million BTU and R equals the heat input in millions BTU per hour.

c. For all fuel-burning equipment— exhibit visible emissions, the opacity of which is equal to or greater than 20 percent except for one six-minute period per hour of not more than 27 percent opacity.
[391-3-1-.02(2)(d)3.]

2.6 The Permittee shall not burn any fuel other than natural gas in the fuel burning equipment, unless otherwise specified by the Director.
[391-3-1-.03(2)(c) and 391-3-1-.02(2)(g)2.]

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2.7 The Permittee shall take all reasonable precautions to prevent fugitive dust from becoming airborne from any operation, process, handling, and transportation or storage facility. The opacity from any fugitive dust source shall not equal or exceed twenty percent. Reasonable precautions that should be taken to prevent dust from becoming airborne include, but are not limited to, the following:
[391-3-1-.02(2)(n)]

- a. Use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads, or the clearing of land.
- b. Application of asphalt, water, or suitable chemicals on dirt roads, materials, stockpiles, and other surfaces that can give rise to airborne dusts.
- c. Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Adequate containment methods can be employed during sandblasting or other similar operations.
- d. Covering, at all times when in motion, open-bodied trucks, transporting materials likely to give rise to airborne dust; and
- e. The prompt removal of earth or other material from paved streets onto which earth or other material has been deposited.

3. Fugitive Emissions

3.1 The Permittee shall take all reasonable precautions with any operation, process, handling, transportation, or storage facilities to prevent fugitive emissions of air contaminants.

4. Process & Control Equipment

Not applicable.

5. Monitoring

Not applicable.

6. Performance Testing

6.1 The Permittee shall cause to be conducted a performance test at any specified emission point when so directed by the Division. The following provisions shall apply with regard to such tests:

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- a. All tests shall be conducted, and data reduced in accordance with applicable procedures and methods specified in the Division's Procedures for Testing and Monitoring Sources of Air Pollutants.
 - b. All test results shall be submitted to the Division within sixty (60) days of the completion of testing.
 - c. The Permittee shall provide the Division thirty (30) days prior written notice of the date of any performance test(s) to afford the Division the opportunity to witness and/or audit the test and shall provide with the notification a test plan in accordance with Division guidelines.
 - d. All monitoring systems and/or monitoring devices required by the Division shall be installed, calibrated and operational prior to conducting any performance test(s). For any performance test, the Permittee shall, using the monitoring systems and/or monitoring devices, acquire data during each performance test run. All monitoring system and/or monitoring device data acquired during the performance testing shall be submitted with the performance test results.
- 6.2 Within 120 days after achieving the maximum production for the Solar Cell Module Assembly Process (ID No. PR01), the Permittee shall conduct a performance test on PR01's one tabbing and one lamination process to determine each of the formaldehyde and hydrogen fluoride forming rates from each process, in pound pollutant per kW of product. The test shall be conducted at the maximum operating capacities of all the associated emission units and control devices.

7. Notification, Reporting and Record Keeping Requirements

- 7.1 The Permittee shall submit written notification of startup to the Division within 15 days after such date. The notification shall be submitted to:
Mr. Sean Taylor
Stationary Source Compliance Program
4244 International Parkway, Suite 120
Atlanta GA 30354
- 7.2 The Permittee shall maintain monthly usage records of all VOC containing materials used in the entire facility and the total kW of products that went through tabbing and lamination processes of all process lines. These records shall include the total weight of each material used and the VOC content of each material (expressed as a weight percentage). If the Permittee wishes to subtract the volatile content of waste materials from the VOC emissions calculations, the records must also indicate the weight of any containerized material disposed as waste, the VOC content of the containerized waste material, and documentation of the method for determining the VOC content of the waste material.
- [391-3-1-.02(6)(b)1]

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7.3 The Permittee shall use the records required in Conditions 6.2 and 7.2 to calculate combined total monthly VOC emissions from entire facility. All demonstration calculations, including any Division-approved emission factor, control efficiency and/or coating transfer efficiency used in the calculations, shall be kept as part of the records required in Condition 7.2. The Permittee shall notify the Division in writing if the combined total monthly VOC emissions from entire facility exceed 8.33 tons during any calendar month. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to maintain compliance with the emission limit in Condition 2.1.

[391-3-1-.02(6)(b)1]

7.4 The Permittee shall use the monthly VOC emission data required in Condition 7.3 to calculate the combined 12-month rolling total of VOC emissions from entire facility for each calendar month. The Permittee shall notify the Division in writing if the combined 12-month rolling total of VOC emissions from entire facility equals or exceeds 100 tons per year. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to attain compliance with the emission limit in Condition 2.1.

[391-3-1-.02(6)(b)1]

7.5 The Permittee shall use the following equations when calculating the monthly VOC emissions from the entire facility in accordance with Condition 7.2. All calculations should be kept as part of the monthly record. These records shall be kept available for inspection by or submittal to the Division for five years from the date of record.

[391-3-1-.02(6)(b)1]

- a. VOC_i (lbs.) = Material use (lbs.) * (% weight VOC); or
- b. VOC_i (lbs.) = Material used (gallons) * (VOC Content lbs./gallon); or
- c. VOC_w (lbs.) = Waste Material (lbs.) * (% weight VOC); or
- d. VOC_w (lbs.) = Waste Material (gallons) * (VOC Content lbs./gallon)
- e. $Total\ VOC\ (lbs.) = (\sum_{i=1}^n VOC_i - \sum_{i=1}^n VOC_w) + EF_{Tab} * P_{Tab} + EF_{Lam} * P_{Lam}$

Where:

- EF_{Tab} = Tabbing formaldehyde forming rates, determined in accordance with Condition 6.2, in pounds formaldehyde per kW product.
- P_{Tab} = Total monthly amount of tabbed products of all manufacturing lines, determined in accordance with Condition 7.2, in kW product per month.
- EF_{Lam} = Lamination formaldehyde forming rates, determined in accordance with Condition 6.2, in pounds formaldehyde per kW product.
- P_{Lam} = Total monthly amount of laminated products of all manufacturing lines, determined in accordance with Condition 7.2, in kW product per month.

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The Permittee shall calculate formaldehyde emissions from the tabbing and lamination processes by using the following emission factor and the equation provided in this condition prior to the initial performance tests.

Table 7.5: Formaldehyde Emission Factor That Should Be Used Before Any Test Results Are Available

Pollutant	Tabbing Emission Factor (lb./kW)	Lamination Emission Factor (lb./kW)
Formaldehyde	1.67E-04	9.99E-04

- 7.6 The Permittee shall maintain monthly usage records of all HAP containing materials used in the entire facility and the total kW of products that went through tabbing and lamination processes of all process lines. These records shall include the total weight of each material used and the HAP content of each material (expressed as a weight percentage). If the Permittee wishes to subtract the HAP content of waste materials from the HAP emissions calculations, the records must also indicate the weight of any containerized material disposed as waste, the HAP content of the containerized waste material, and documentation of the method for determining the HAP content of the waste material.
[391-3-1-.02(6)(b)1]
- 7.7 The Permittee shall use the records obtained in accordance with Conditions 6.2 and 7.6 to determine the total monthly emissions of combined HAP and the total monthly emissions of each listed HAP from entire facility. All demonstration calculations, including any Division-approved emission factor, control efficiency and/or coating transfer efficiency used in the calculations, shall be kept as part of the records required in Condition 7.6. The Permittee shall notify the Division in writing if emissions of any individual HAP exceeds 0.83 tons from entire facility, or if emissions of all listed HAP combined exceed 2.08 tons from entire facility, during any calendar month. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to maintain compliance with the emission limit in Condition 2.2.
[391-3-1-.02(6)(b)1]
- 7.8 The Permittee shall use the monthly HAP emission data required in Condition 7.7 to determine the twelve-month rolling total emissions of each individual HAP for each month and the twelve-month rolling total combined HAP emissions for each month from entire facility. The Permittee shall notify the Division in writing if the combined HAP emissions from entire facility equal or exceed 25 tons and/or any individual HAP equals or exceeds 10 tons during any consecutive twelve-month period. This notification shall be postmarked by the fifteenth day of the following month and shall include an explanation of how the Permittee intends to attain compliance with the emission limit in Condition 2.2.
[391-3-1-.02(6)(b)1]

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7.9 The Permittee shall use the following equations when calculating the monthly HAP emissions from the entire facility in accordance with Condition 7.6. All calculations should be kept as part of the monthly record.

[391-3-1-.02(6)(b)1]

- a. HAP_i (lbs.) = Material use (lbs.) * (% weight HAP); or
- b. HAP_i (lbs.) = Material used (gallons) * (HAP Content lbs./gallon); or
- c. HAP_w (lbs.) = Waste Material (lbs.) * (% weight HAP); or
- d. HAP_w (lbs.) = Waste Material (gallons) * (HAP Content lbs./gallon)
- e. Total HAP (lbs.) = $(\sum_{i=1}^n HAP_i - \sum_{w=1}^n HAP_w) + \sum(EF_{Tab} * P_{Tab}) + \sum(EF_{Lam} * P_{Lam})$

Where:

- EF_{Tab} = Tabbing formaldehyde and hydrogen fluoride forming rates, determined in accordance with Condition 6.2, in pounds pollutant per kW product.
- P_{Tab} = Total monthly amount of tabbed products of all manufacturing lines, determined in accordance with Condition 7.6, in kW product per month.
- EF_{Lam} = Lamination formaldehyde and hydrogen fluoride forming rates, determined in accordance with Condition 6.2, in pounds formaldehyde per kW product.
- P_{Lam} = Total monthly amount of laminated products of all manufacturing lines, determined in accordance with Condition 7.6, in kW product per month.

The Permittee shall calculate formaldehyde and hydrogen fluoride emissions from the tabbing and lamination process by using the following emission factor and the equation provided in this condition prior to the initial performance tests.

Table 7.9: Formaldehyde and Hydrogen Fluoride Emission Factor That Should Be Used Before Any Test Results Are Available

Pollutant	Tabbing Emission Factor (lb./kW)	Lamination Emission Factor (lb./kW)
Formaldehyde	1.67E-04	9.99E-04
Hydrogen Fluoride	1.68E-04	1.93E-05

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8. Special Conditions

- 8.1 At any time that the Division determines that additional control of emissions from the facility may reasonably be needed to provide for the continued protection of public health, safety and welfare, the Division reserves the right to amend the provisions of this Permit pursuant to the Division's authority as established in the Georgia Air Quality Act and the rules adopted pursuant to that Act.

- 8.2 The Permittee shall calculate and pay an annual Permit fee to the Division. The amount of the fee shall be determined each year in accordance with the "Procedures for Calculating Air Permit Application & Annual Permit Fees."