

Facility ID: 1483080196 Issuance type: Final State Permit To Operate

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In addition to the terms and conditions, hyperlinks have been inserted into the document so you may more readily access the section of the document you wish to review.

Finally, the term language under "Part II" and before "A. Applicable Emissions Limitations..." has been added to aid in document conversion, and was not part of the original issued permit.

THIS IS NOT AN OFFICIAL VERSION OF THE PERMIT. SEE PAGE 1 FOR ADDITIONAL INFORMATION

Facility ID: 1483080196 Emissions Unit ID: P001 Issuance type: Final State Permit To Operate

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Part II - Special Terms and Conditions

This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

1. For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - (a) None.
2. For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - (a) None.

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
epitaxial wafer manufacturing controlled with a caustic scrubber and packed bed mist eliminator	OAC rule 3745-31-05(A)(3) (PTI 14-04640)	0.72 lb/hour of hydrogen chloride (HCl) emissions 3.15 tons per year (TPY) of HCl emissions 0.03 lb/hour of hydrogen fluoride (HF) emissions 0.13 TPY of HF emissions

See Sections A.2, B.1 and B.2 below.

2. **Additional Terms and Conditions**
 - (a) The hourly HCl and HF emission limitations specified above are based upon the emissions unit's potential to emit. Therefore, no hourly records are required to demonstrate compliance with these limits.

B. Operational Restrictions

1. During periods of operation when the hydrogen recovery system is off-line and caustic scrubber is on-line, on this emissions unit, the pH of the scrubber liquor shall be maintained at, or above, 7.5.
2. During periods of operation when the hydrogen recovery system is off-line and caustic scrubber is on-line, on this emissions unit, the scrubber water flow rate shall be continuously maintained at a value of not less than 60 gallons per minute.

C. Monitoring and/or Record Keeping Requirements

1. The permittee shall properly install, operate and maintain equipment to continuously monitor the pH of the caustic scrubber liquor while this emissions unit is in operation.

The pH monitor shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operation manuals.

The permittee shall collect and record the following information each day for this emissions unit:

 - a. the pH of the scrubber liquor, on a once-per-shift basis; and
 - b. a log or record of operating time for the capture (collection) system, control devices, monitoring equipment and the associated emissions unit.
2. The permittee shall properly install, operate and maintain equipment to continuously monitor the caustic scrubber water flow rate while this emissions unit is in operation. The monitoring device shall be installed, calibrated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

The permittee shall collect and record the following information each day for this emissions unit:

 - a. the scrubber water flow rate, in gallons per minute, on a once-per-shift basis; and
 - b. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.
3. The permit to install for this emissions unit was evaluated based on the actual materials employed and the design

parameters of the emissions unit's exhaust system, as specified by the permittee in the permit to install application. Ohio EPA's "Review of New Sources of Air Toxics Emissions" policy ("Air Toxics Policy") was applied for each toxic pollutant emitted by this emissions unit using data from the permit to install application and the SCREEN 3.0 model (or other Ohio EPA approved model). The predicted 1-hour maximum ground-level concentration from the use of the SCREEN 3.0 model was compared to the Maximum Acceptable Ground-Level Concentration (MAGLC).

The following summarizes the results of the modeling for the "worst case" pollutant:

Pollutant: hydrogen chloride
 TLV (ug/m3): 5,530
 Maximum Hourly Emission Rate (lbs/hr): 0.144
 Predicted 1-Hour Maximum Ground-Level
 Concentration (ug/m3): 49.8
 MAGLC (ug/m3): 132

Physical changes to or in the method of operation of the emissions unit after its installation or modification could affect the parameters used to determine whether or not the "Air Toxics Policy" is satisfied. Consequently, prior to making a change that could impact such parameters, the permittee shall conduct an evaluation to determine that the "Air Toxics Policy" will still be satisfied. If, upon evaluation, the permittee determines that the "Air Toxics Policy" will not be satisfied, the permittee shall not make the change. Changes that can affect the parameters used in the "Air Toxics Policy" include the following:

a. changes in the composition of the materials used, or the use of new materials that would result in the emission of a compound with a lower Threshold Limit Value (TLV), as indicated in the most recent version of the handbook entitled "American Conference of Governmental Industrial Hygienists (ACGIH)," than the lowest TLV value previously modeled;

b. changes in the composition of the materials, or use of new materials, that would result in an increase in emissions of any pollutant with a listed TLV that was proposed in the application and modeled; and

c. physical changes to the emissions unit or its exhaust parameters (e.g., increased/decreased exhaust flow, changes in stack height, changes in stack diameter, etc.).

If the permittee determines that the "Air Toxics Policy" will be satisfied with the above changes, Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01(VV)(1)(a)(ii), and a modification of the existing permit to install will not be required. If the change(s) is (are) defined as a modification under other provisions of the modification definition [other than (VV)(1)(a)(ii)], then the permittee shall obtain a final permit to install prior to the change.

The permittee shall collect, record, and retain the following information when it conducts evaluations to determine that the changed emissions unit will satisfy the "Air Toxics Policy":

a. a description of the parameters changed (composition of materials, new pollutants emitted, change in stack/exhaust parameters, etc.);

b. documentation of its evaluation and determination that the changed emissions unit still satisfies the "Air Toxics Policy"; and

c. when computer modeling is performed, a copy of the resulting computer model runs that show the results of the application of the "Air Toxics Policy" for the change.

D. Reporting Requirements

1. The permittee shall submit quarterly deviation (excursion) reports that identify all periods of time during which the scrubber liquor pH did not comply with the pH requirement specified in Section B.1. If no deviations occurred, then the permittee shall submit a report stating so.
2. The permittee shall submit quarterly deviation (excursion) reports that identify all periods of time during which the the scrubber water flow rate was not maintained at or above the required level specified in Section B.2. If no deviations occurred, then the permittee shall submit a report stating so.

All quarterly deviation reports shall be submitted in accordance with the General Terms and Conditions of this permit.

E. Testing Requirements

1. Compliance with the HCl emission limitation, HF emission limitation, pH restriction and scrubber water flow rate restriction shall be determined by the following methods:

a. HCl Emission Limitations: 0.72 lb/hour of HCl emissions; 3.15 TPY of HCl emissions

Applicable Compliance Method: The hourly HCl emission limitation is based on the emission unit's potential to emit and was established by taking the total number of process emission points (45 epitaxial reactors), multiplying by the uncontrolled HCl emission rate (1.6 lbs of HCl/hour/reactor *), and multiplying by 1 - the fractional control efficiency (0.99) of the control devices. The annual HCl emissions were determined by multiplying the hourly HCl emission rate by the maximum work hours per year (8,760 hours/year) and dividing by 2,000 lbs/ton. Therefore, compliance with the annual HCl emission limitation will be ensured if compliance is maintained with the hourly HCl emission limitation.

If required, the permittee shall demonstrate compliance with the hourly HCl emission limitation through emission tests performed in accordance with 40 CFR, Part 60, Appendix A, Methods 1 through 4 and 26.

*The uncontrolled HCl emission rate of 1.6 lbs of HCl/hour was determined from air emission data (mass balance) obtained from the permittee.

b. HF Emission Limitation: 0.03 lb/hour of HF emissions; 0.13 TPY of HF emissions

Applicable Compliance Method: The hourly HF emission limitation is based on the emission unit's potential to emit and was established by taking the total number of process emission points (two quartz parts cleaning

operations and one post epitaxial deposition cleaning operation), multiplying by the HF emission rates (2 lbs of HF emissions/hour/quartz parts cleaning operation and 1 lb of HF emissions/hour/post epitaxial deposition cleaning operation), and multiplying by 1 - the fractional control efficiency (0.99) of the control devices. The annual HF emission limitation was determined by multiplying the hourly HF emission rate by the maximum work hours per year (8,760 hours/year) and divided by 2,000 lbs/ton. Therefore, compliance with the annual HF emission limitation will be ensured if compliance is maintained with the hourly HF emission limitation.

If required, the permittee shall demonstrate compliance with the hourly HF emission limitation through emission tests performed in accordance with 40 CFR, Part 60, Appendix A, Methods 1 through 4 and 26.

c. pH Restriction: the pH of the scrubber liquor shall be maintained at, or above, 7.5.

Applicable Compliance Method: Compliance with the pH restriction for the scrubber liquor shall be determined by the record keeping requirements specified in Section C.1.

d. Scrubber Water Flow Rate Restriction: The scrubber water flow rate shall not be less than 60 gallons per minute.

Applicable Compliance Method: Compliance with the scrubber water flow rate restriction shall be determined by the record keeping requirements specified in Section C.2.

F. **Miscellaneous Requirements**

1. None