State of Ohio Environmental Protection Agency

**RE: FINAL PERMIT TO INSTALL MODIFICATION** **CERTIFIED MAIL**
**WARREN COUNTY**

Street Address:
122 S. Front Street

Lazarus Gov. Center **TELE:** (614) 644-3020 **FAX:** (614) 644-2329

Mailing Address:
Lazarus Gov. Center
P.O. Box 1049

**Application No: 14-05619**
**Fac ID:** 1483080196
**DATE: 8/30/2005**

SUMCO USA
William Romaine
537 Grandin Road
Maineville, OH 45039-0000

Enclosed Please find a modification to the Ohio EPA Permit To Install referenced above which will modify the terms and conditions.

You are hereby notified that this action by the Director is final and may be appealed to the Ohio Environmental Review Appeals Commission pursuant to Chapter 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. It must be filed within thirty (30) days after the notice of the Directors action. A copy of the appeal must be served on the Director of the Ohio Environmental Protection Agency within three (3) days of filing with the Commission. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, Ohio 43215

Sincerely,

Michael W. Ahern

Michael W. Ahern, Manager
Permit Issuance and Data Management Section
Division of Air Pollution Control

**CC: USEPA** **HCDES**

OhioEPA

STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY

**Permit To Install** **Issue Date: 8/30/2005**
**Terms and Conditions** **Effective Date: 8/30/2005**

**FINAL ADMINISTRATIVE MODIFICATION OF PERMIT TO INSTALL 14-05619**

| | |
|---|---|
| Application Number: | 14-05619 |
| Facility ID: | 1483080196 |
| Permit Fee: | **$400** |
| Name of Facility: | SUMCO USA |
| Person to Contact: | William Romaine |
| Address: | 537 Grandin Road<br>Maineville, OH 45039-0000 |

Location of proposed air contaminant source(s) [emissions unit(s)]:
**537 Grandin Road**
**Maineville**, **Ohio**

Description of proposed emissions unit(s):
**Administrative Modification to PTI 14-05619 to update Monitoring, Recordkeeping and Testing Requirements and to correct the scrubber liquor pH range.**

The above named entity is hereby granted a modification to the permit to install described above pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this modification does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described source(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans included in the application, the above described source(s) of pollutants will be granted the necessary operating permits.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Joseph P. Koncelik

Director

## Part I - GENERAL TERMS AND CONDITIONS

### A. Permit to Install General Terms and Conditions

#### 1. Compliance Requirements

The emissions unit(s) identified in this Permit to Install shall remain in full compliance with all applicable State laws and regulations and the terms and conditions of this permit.

#### 2. Reporting Requirements

The permittee shall submit required reports in the following manner:

a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.

b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

#### 3. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.

#### 4. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon

the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

**5. Scheduled Maintenance/Malfunction Reporting**

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions units or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emissions unit(s) that is (are) served by such control system(s).

**6. Permit Transfers**

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

**7. Air Pollution Nuisance**

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

**8. Termination of Permit to Install**

This Permit to Install shall terminate within eighteen months of the effective date of the Permit to Install if the owner or operator has not undertaken a continuing program of installation or modification or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation or modification. This deadline may be extended by up to 12 months if application is made to the Director within a reasonable time before the termination date and the party shows good cause for any such extension.

**9. Construction of New Sources(s)**

The proposed emissions unit(s) shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources cannot meet the requirements of this permit or cannot meet applicable standards.

If the construction of the proposed emissions unit(s) has already begun or has been completed prior to the date the Director of the Environmental Protection Agency approves the permit application and plans, the approval does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the approved plans. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of the Permit to Install does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Approval of the plans in any case is not to be construed as an approval of the facility as constructed and/or completed. Moreover, issuance of the Permit to Install is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities cannot meet the requirements of this permit or cannot meet applicable standards.

## 10. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

## 11. Applicability

This Permit To Install is applicable only to the emissions unit(s) identified in the Permit To Install. Separate Permit To Install for the installation or modification of any other emissions unit(s) are required for any emissions unit for which a Permit To Install is required.

### 12. Best Available Technology

As specified in OAC Rule 3745-31-05, all new sources must employ Best Available Technology (BAT). Compliance with the terms and conditions of this permit will fulfill this requirement.

### 13. Source Operation and Operating Permit Requirements After Completion of Construction

This facility is permitted to operate each source described by this Permit to Install for a period of up to one year from the date the source commenced operation. This permission to operate is granted only if the facility complies with all requirements contained in this permit and all applicable air pollution laws, regulations, and policies. Pursuant to OAC Chapter 3745-35, the permittee shall submit a complete operating permit application within ninety (90) days after commencing operation of the emissions unit(s) covered by this permit.

### 14. Construction Compliance Certification

The applicant shall provide Ohio EPA with a written certification (see enclosed form) that the facility has been constructed in accordance with the Permit to Install application and the terms and conditions of the Permit to Install. The certification shall be provided to Ohio EPA upon completion of construction but prior to startup of the source.

### 15. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable Permit to Install fees within 30 days after the issuance of this Permit to Install.

## B. Permit to Install Summary of Allowable Emissions

The following information summarizes the total allowable emissions, by pollutant, based on the individual allowable emissions of each air contaminant source identified in this permit.

SUMMARY (for informational purposes only)
TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS

| Pollutant | Tons Per Year |
|---|---|
| acid mists | 0.36 |
| OC | 4.67 |
| NOx | 9.46 |
| HCl | 0.18 |
| ammonia | 0.35 |

**SUMCO USA** **Facility ID: 148308019**
**PTI Application: 14-05619**
**Modification Issued: 8/30/2005**

Emissions Unit ID: **P075**

## PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

### A. Applicable Emissions Limitations and/or Control Requirements

**1.** The specific operations(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 specified in narrative form following the table.

| Operations, Property, and/or Equipment | Applicable Rules/Requirements | permitting requirements) |
|---|---|---|
| | | OAC rule 3745-17-07(A)(1) |
| P075 - Exhaust Line Etch (Etch-07), Bell Jar Etch (Etch-08), Small Quartz Etch (Etch-09) with Fume Scrubber S-01 - Modification | OAC rule 3745-31-05(A)(3) | |
| | | OAC rule 3745-17-11(B) |
| | OAC rule 3745-31-05(C) (to avoid being subject to OAC rule 3745-31-28 and Title V | |

| Applicable Emissions Limitations/Control Measures | |
|---|---|
| The acid mist emissions shall not exceed 0.028 pound per hour. | specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| The acid mist emissions shall not exceed 0.12 TPY. | |
| The organic compounds (OC) emissions from the parts drying process shall not exceed 2.0 pounds per hour. | |
| The OC from the parts drying process emissions shall not exceed 0.4 TPY<br><br>See T&C B.1. | |
| The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(C) and OAC rule 3745-17-07(A)(1).<br><br>See T&C A.2.a. | |
| Visible particulate emissions from any stack associated with emissions unit P075 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule. | |
| The emission limitation | |

## 2. Additional Terms and Conditions

**2.a** The actual emissions of Hazardous Air Pollutants (HAPs), as identified in Section 112(b) of Title III of the Clean Air Act from emissions units P001 (Silicon Wafer Manufacturing), P004 (Epitaxial Silicon Wafer Mfg.), P005 (Silicon Wafer Wax mount-removal), P006 (Poly clean Etch Line), P007 Mini-Preclean Line), P008 (Silicon Crystal Formation Process), P009 (Silicone Crystal), P010 (Lapping Process), P012 (Silicone Wafer), P013 (Reactors Process), P014 (Polishing Process), P015 (Final Clean), P016 (Materials Characterization), P017 (Epitaxial Reactor), P020 (Silicon Wafer Mfg.), P021 (ASM Single Wafer Epitaxial Reactor #63), P022 (ASM Single Wafer Epitaxial Reactor #64), P023 (ASM Single Wafer Epitaxial Reactor #65), P024 (E01 - EpiPro Pancake Reactor), P025 (E02 - EpiPro Pancake Reactor), P026 (E03 - EpiPro Pancake Reactor), P027 (E04 - EpiPro Pancake Reactor), P028 (E05 - EpiPro Pancake Reactor), P029 (E06 - EpiPro Pancake Reactor), P030 (E07 - EpiPro Pancake Reactor), P031 (E08 - EpiPro Pancake Reactor), P032 (G01 - Gemini III Pancake Reactor), P033 (G02 - Gemini III Pancake Reactor), P034 (G03 - Gemini III Pancake Reactor), P035 (G04 - Gemini III Pancake Reactor), P036 (A01 - ASM Single Wafer Reactor), P037 (A02 - ASM Single Wafer Reactor), P038 (A03 - ASM Single Wafer Reactor), P039 (A04 - ASM Single Wafer Reactor), P040 (A05 - ASM Single Wafer Reactor), P041 (A06 - ASM Single Wafer Reactor), P042 (A07 - ASM Single Wafer Reactor), P043 (A08 - ASM Single Wafer Reactor), P044 (A09 - ASM Single Wafer Reactor), P045 (A10 - ASM Single Wafer Reactor), P046 (A11 - ASM Single Wafer Reactor), P047 (A12 - ASM Single Wafer Reactor), P048 (A13 - ASM Single Wafer Reactor), P049 (A14 - ASM Single Wafer Reactor), P050 (A15 - ASM Single Wafer Reactor), P051 (B05 - AMT Barrel Reactor), P052 (B06 - AMT Barrel Reactor), P053 (AMT Barrel Reactor), P054 (B08 - AMT Barrel Reactor), P055 (B09 - AMT Barrel Reactor), P056 (B10 - AMT Barrel Reactor), P057 (B11 - AMT Barrel Reactor), P058 (B12 - AMT Barrel Reactor), P059 (B13 - AMT Barrel Reactor), P060 (B14 - AMT Barrel Reactor), P061 (B15 - AMT Barrel Reactor), P062 (B16 - AMT Barrel Reactor), P063 (B17 - AMT Barrel Reactor), P064 (B18 - AMT Barrel Reactor), P065 (B19 - AMT Barrel Reactor), P066 (B20 - AMT Barrel Reactor), P067 (B21 - AMT Barrel Reactor), P068 (B22 - AMT Barrel Reactor), P069 (B23 - AMT Barrel Reactor), P070 (B24 - AMT Barrel Reactor), P071 (B25 - AMT Barrel Reactor), P072 (B26 - AMT Barrel Reactor), P073 (B27 - AMT Barrel Reactor), P074 (B28 - AMT Barrel Reactor), P075 (Exhaust Line Etch-07, Bell Jar Etch-08, Small Quartz Etch-09), P076 (Acid Etch-10), P077 (Acid Etch-11), P078 (Mounter/Polisher Line 1), and P079 (Acid Etch-11, Side B) shall not exceed 9.9 TPY for any single HAP and 24.9 TPY for any combination of

HAPs, including HAP acid mists. Compliance with the above limitations shall be based on rolling, 12-month summations. The permittee has existing records to demonstrate compliance with these limits upon issuance of this permit.

**2.b** The hourly emissions limitations outlined in term A.1. are based upon the emissions unit's potential to emit. Therefore, no hourly records are required to demonstrate compliance with these limits.

**2.c** Compliance with OAC rule 3745-31-05(A)(3) shall be demonstrated by the use of a wet scrubber, compliance with the operational restrictions, compliance with the emissions limitations, and compliance with the rolling, 12-month HAPs emissions limitations.

## B. Operational Restrictions

1. For purposes of avoiding state new source review modeling, the maximum annual material usage in the parts drying process for this emissions unit shall not exceed 800 pounds per year.

2. The S-01 scrubber water re-circulation flow rate shall be continuously maintained at a value of not less than 125 gallons per minute at all times while the emissions unit is in operation.

3. The pH of the S-01 scrubber liquor shall be maintained within the range of 8-13 at all times while the emissions unit is in operation.

## C. Monitoring and/or Recordkeeping Requirements

1. The permittee shall maintain monthly records of the material usage in the parts drying process, in pounds in this emissions unit.

2. The permittee shall properly install, operate and maintain equipment to continuously monitor the scrubber water recirculation flow rate into the scrubber and the pH of the scrubber liquor while the emissions unit is in operation. The monitoring devices and any recorders shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

   The permittee shall collect and record the following information each day:

   a. the scrubber water recirculation flow rate, in gallons per minute, on a once per

day basis;

b. the pH of the scrubber liquor, on a once per day basis; and

c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

3. The permittee shall collect and record the following information each month for all the emissions units listed in term A.2.a:

a. the name and identification number of each HAP-containing material employed;

b. the individual HAP content for each HAP-containing material employed, in pounds of individual HAP per material employed;

c. the amount of each individual HAP-containing material employed in the manufacturing processes in the units consistent with those in the facility-wide usage tracking tables submitted as part of PTI Application 14-05619, April 4, 2005 in tons per month and tons per 12-month rolling period;

d. the total combined HAP content for each HAP-containing material employed, in pounds of combined HAP per material employed (sum of all individual OC-HAP contents; sum of all individual hydrochloric acid-HAP contents + the sum of all individual hydrogen fluoride-HAP contents from term b above);

e. for the entire facility, the total individual HAP emissions from all materials employed, in tons per month (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

f. for the entire facility, the total combined HAPs emissions from all materials employed, in tons per month (the sum of all HAPs as calculated, (the sum of all HAP, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid -HAP contents from term d times term c times the emission factor, in the appropriate units (if

necessary) times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

g. for the entire facility, the updated rolling, 12-month summation of each individual HAP emissions, in tons (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP contents from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months; and

h. for the entire facility, the updated rolling, 12-month summation of total combined HAPs emissions, in tons (the sum of all HAPs, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months.

* A listing of the HAPs can be found in Section 112(b) of the Clean Air Act or can be obtained by contacting your Hamilton County Department of Environmental Services contact. This information does not have to be kept on a individual emissions unit basis.

## D. Reporting Requirements

1. The permittee shall submit quarterly deviation (excursion) reports to the Hamilton County Department of Environmental Services that identify all periods of time during which the following scrubber parameters were not maintained within the requirements of the Operational Restrictions:

a. the scrubber water recirculation flow rate; and

b. the scrubber solution pH.

If no exceedances occurred, the permittee shall state so in the report. These reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

2. The permittee shall notify the Hamilton County Department of Environmental Services of any exceedance of the HAP emissions limitations outlined in T&C A.2.a. If no exceedances occurred, the permittee shall state so in the report. The reports shall be submitted by January 31, April 30, July 31 and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

3. The permittee shall submit annual deviation (excursion) reports to the Hamilton County Department of Environmental Services that identify any exceedance of the Operational Restriction for the maximum annual material usage in the parts drying process. If no exceedances occurred during the reporting period then a report is required stating so. These reports shall be submitted by January 31 of each year and shall cover the previous calendar year.

## E. Testing Requirements

1. Emissions Limitations:

The acid mist emissions shall not exceed 0.028 pound per hour.
The acid mist emissions shall not exceed 0.12 TPY.

Applicable Compliance Methods:

a. if required, compliance with the hourly acid mist emissions limitation shall be demonstrated by inputting actual stack emissions data into the following equation:

[(ppm)(MW)(dscfm)(60) / (24.45)(453590)(35.3147)] = lbs acid mist emissions/hr

where:

ppm = the acid mist measured in the exhaust air from the most recent

compliance stack test or facility measurement, parts per million
MW = molecular weight of the compound
dscfm = exhaust air flow measured during the most recent compliance stack test or facility measurement, dry standard cubic feet per minute; and

b. if required, compliance with the annual acid mist emissions limitation shall be demonstrated by multiplying the hourly acid mist emissions, as determined in a. by the actual operating hours per year, and divided by 2000 such that the total equals TPY acid mist emissions.

2. Emissions Limitations:

The organic compounds (OC) emissions from the parts drying process shall not exceed 2.0 pounds per hour.
The OC emissions from the parts drying process shall not exceed 0.4 TPY.

Applicable Compliance Methods:

a. if required, compliance with the hourly OC emissions limitation shall be demonstrated by multiplying the actual OC material application rate in the parts drying section (gal material/hr) by the actual OC content of the material (lbs OC/gallon material) = lbs OC/hr; and

b. if required, compliance with the annual OC emissions limitation shall be demonstrated by multiplying the actual annual cleanup material usage rate (pounds cleanup material/yr) by the cleanup material OC content (pound OC/pound cleanup material) and by 1 Ton/2000 lbs = TPY OC.

3. Emissions Limitation

Visible particulate emissions from any stack associated with emissions unit P075 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule

Applicable Compliance Method

If required, compliance shall be determined in accordance with Test Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources"), as such Appendix existed on July 1, 1996.

4. Compliance with the HAP emissions limit in term A.2.a shall be demonstrated by the

record keeping in term C.3.

5. Compliance with term B.1 shall be demonstrated by the record keeping in term C.1.

## F. Miscellaneous Requirements

1. Modeling to demonstrate compliance with the Ohio EPA's "Air Toxic Policy" was not necessary because the emissions unit's maximum annual emissions for each toxic compound will be less than 1.0 ton. OAC Chapter 3745-31 requires permittees to apply for and obtain a new or modified permit to install prior to making a "modification" as defined by OAC rule 3745-31-01. The permittee is hereby advised that changes in the composition of the materials, or use of new materials, that would cause the emissions of any pollutant that has a listed TLV to increase to above 1.0 ton per year may require the permittee to apply for and obtain a new permit to install.

2. The terms and conditions in this permit to install shall supercede the terms and conditions in permit to install 14-05619 issued on December 16, 2004.

## PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

### A. Applicable Emissions Limitations and/or Control Requirements

**1.** The specific operations(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 specified in narrative form following the table.

| Operations, Property, and/or Equipment | Applicable Rules/Requirements | rules 3745-31-28 and Title V permitting requirements) |
|---|---|---|
| P076 - Acid Etch (Etch-10) with NOx scrubber - Modification. | OAC rule 3745-31-05(A)(3) | OAC rule 3745-17-07(A)(1) |
| | | OAC rule 3745-17-11(B) |
| | | OAC rule 3745-23-06(B) |
| | OAC rule 3745-31-05(C) (to avoid being subject to OAC | |

| Applicable Emissions Limitations/Control Measures | |
|---|---|
| The acid mist emissions shall not exceed 0.038 pound per hour. | See T&C A.2.a. |
| The acid mist emissions shall not exceed 0.17 TPY. | Visible particulate emissions from any stack associated with emissions unit P076 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule. |
| The nitrogen oxides (NOx) emissions shall not exceed 1.50 pounds per hour. | The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| The NOx emissions shall not exceed 6.57 TPY | See T&C A.2.d. |
| See T&C B.1. - B.4. | |
| The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(C), OAC rule 3745-23-06(B), and OAC rule 3745-17-07(A)(1). | |

Emissions Unit ID: **P076**

## 2. Additional Terms and Conditions

**2.a** The actual emissions of Hazardous Air Pollutants (HAPs), as identified in Section 112(b) of Title III of the Clean Air Act from emissions units P001 (Silicon Wafer Manufacturing), P004 (Epitaxial Silicon Wafer Mfg.), P005 (Silicon Wafer Wax mount-removal), P006 (Poly clean Etch Line), P007 Mini-Preclean Line), P008 (Silicon Crystal Formation Process), P009 (Silicone Crystal), P010 (Lapping Process), P012 (Silicone Wafer), P013 (Reactors Process), P014 (Polishing Process), P015 (Final Clean), P016 (Materials Characterization), P017 (Epitaxial Reactor), P020 (Silicon Wafer Mfg.), P021 (ASM Single Wafer Epitaxial Reactor #63), P022 (ASM Single Wafer Epitaxial Reactor #64), P023 (ASM Single Wafer Epitaxial Reactor #65), P024 (E01 - EpiPro Pancake Reactor), P025 (E02 - EpiPro Pancake Reactor), P026 (E03 - EpiPro Pancake Reactor), P027 (E04 - EpiPro Pancake Reactor), P028 (E05 - EpiPro Pancake Reactor), P029 (E06 - EpiPro Pancake Reactor), P030 (E07 - EpiPro Pancake Reactor), P031 (E08 - EpiPro Pancake Reactor), P032 (G01 - Gemini III Pancake Reactor), P033 (G02 - Gemini III Pancake Reactor), P034 (G03 - Gemini III Pancake Reactor), P035 (G04 - Gemini III Pancake Reactor), P036 (A01 - ASM Single Wafer Reactor), P037 (A02 - ASM Single Wafer Reactor), P038 (A03 - ASM Single Wafer Reactor), P039 (A04 - ASM Single Wafer Reactor), P040 (A05 - ASM Single Wafer Reactor), P041 (A06 - ASM Single Wafer Reactor), P042 (A07 - ASM Single Wafer Reactor), P043 (A08 - ASM Single Wafer Reactor), P044 (A09 - ASM Single Wafer Reactor), P045 (A10 - ASM Single Wafer Reactor), P046 (A11 - ASM Single Wafer Reactor), P047 (A12 - ASM Single Wafer Reactor), P048 (A13 - ASM Single Wafer Reactor), P049 (A14 - ASM Single Wafer Reactor), P050 (A15 - ASM Single Wafer Reactor), P051 (B05 - AMT Barrel Reactor), P052 (B06 - AMT Barrel Reactor), P053 (AMT Barrel Reactor), P054 (B08 - AMT Barrel Reactor), P055 (B09 - AMT Barrel Reactor), P056 (B10 - AMT Barrel Reactor), P057 (B11 - AMT Barrel Reactor), P058 (B12 - AMT Barrel Reactor), P059 (B13 - AMT Barrel Reactor), P060 (B14 - AMT Barrel Reactor), P061 (B15 - AMT Barrel Reactor), P062 (B16 - AMT Barrel Reactor), P063 (B17 - AMT Barrel Reactor), P064 (B18 - AMT Barrel Reactor), P065 (B19 - AMT Barrel Reactor), P066 (B20 - AMT Barrel Reactor), P067 (B21 - AMT Barrel Reactor), P068 (B22 - AMT Barrel Reactor), P069 (B23 - AMT Barrel Reactor), P070 (B24 - AMT Barrel Reactor), P071 (B25 - AMT Barrel Reactor), P072 (B26 - AMT Barrel Reactor), P073 (B27 - AMT Barrel Reactor), P074 (B28 - AMT Barrel Reactor), P075 (Exhaust Line Etch-07, Bell Jar Etch-08, Small Quartz Etch-09), P076 (Acid Etch-10), P077 (Acid Etch-11), P078 (Mounter/Polisher Line 1), and P079 (Acid Etch-11, Side B) shall not exceed 9.9 TPY for any single HAP and 24.9 TPY for any combination of HAPs, including HAP acid mists. Compliance with the above limitations shall be

based on rolling, 12-month summations. The permittee has existing records to demonstrate compliance with these limits upon issuance of this permit.

**2.b** The hourly emissions limitations outlined in term A.1. are based upon the emissions unit's potential to emit. Therefore, no hourly records are required to demonstrate compliance with these limits.

**2.c** Compliance with OAC rule 3745-31-05(A)(3) shall be demonstrated by the use of a wet scrubber, compliance with the operational restrictions, compliance with the emissions limitations, and compliance with the rolling, 12-month HAPs emissions limitations.

**2.d** The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

## B. Operational Restrictions

1. The NOx-1 scrubber 1st stage water recirculation flow rate shall be continuously maintained at a value of not less than 85 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber. The NOx-1 scrubber 2nd stage water recirculation flow rate shall be continuously maintained at a value of not less than 120 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber.

2. The NOx-2 scrubber 1st/2nd stage water recirculation flow rate shall be continuously maintained at a value of not less than 300 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber. The NOx-2 scrubber 3rd stage water recirculation flow rate shall be continuously maintained at a value of not less than 200 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber.

3. The pH of the scrubbing liquor in the NOx-1 scrubber shall be maintained within the range of 7.5-13.5 at all times when emissions from the emissions unit are being vented to the scrubber.

4. The pH of the scrubbing liquor in the NOx-2 scrubber shall be maintained within the range of 7-13 at all times when emissions from the emissions unit are being vented to the scrubber.

## C. Monitoring and/or Recordkeeping Requirements

1. The permittee shall properly install, operate and maintain equipment to continuously monitor the scrubber water recirculation flow rate into the NOx-1 and NOx-2 scrubbers and the pH of the scrubber liquor of each scrubber while the emissions unit is in operation. The monitoring devices and any recorders shall be installed, calibrated, operated 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 the NOx-1 and NOx-2 scrubbers:

   a. the scrubber water recirculation flow rate of each stage, in gallons per minute, on a once per day basis;

   b. the pH of the scrubber liquor, on a once per day basis; and

   c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

2. The permittee shall collect and record the following information each month for all the emissions units listed in term A.2.a:

   a. the name and identification number of each HAP-containing material employed;

   b. the individual HAP content for each HAP-containing material employed, in pounds of individual HAP per material employed;

   c. the amount of each individual HAP-containing material employed in the manufacturing processes in the units consistent with those in the facility-wide usage tracking tables submitted as part of PTI Application 14-05619, April 4, 2005 in tons per month and tons per 12-month rolling period;

   d. the total combined HAP content for each HAP-containing material employed, in pounds of combined HAP per material employed (sum of all individual OC-HAP contents; sum of all individual hydrochloric acid-HAP contents + the sum of all individual hydrogen fluoride-HAP contents from term b above);

   e. for the entire facility, the total individual HAP emissions from all materials employed, in tons per month (the sum of each HAP, as calculated, by

summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

f. for the entire facility, the total combined HAPs emissions from all materials employed, in tons per month (the sum of all HAPs as calculated, (the sum of all HAP, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid -HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

g. for the entire facility, the updated rolling, 12-month summation of each individual HAP emissions, in tons (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP contents from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months; and

h. for the entire facility, the updated rolling, 12-month summation of total combined HAPs emissions, in tons (the sum of all HAPs, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid-HAP contents from term d times term c times the emission factor, in the appropriate units (if

necessary) times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months.

* A listing of the HAPs can be found in Section 112(b) of the Clean Air Act or can be obtained by contacting your Hamilton County Department of Environmental Services contact. This information does not have to be kept on a individual emissions unit basis.

## D. Reporting Requirements

1. The permittee shall submit quarterly deviation (excursion) reports to the Hamilton County Department of Environmental Services that identify all periods of time during which the following scrubber parameters were not maintained within the requirements of the Operational Restrictions for the NOx-1 and NOx-2 scrubbers:

   a. the scrubber water recirculation flow rate; and

   b. the scrubber solution pH.

   If no exceedances occurred, the permittee shall state so in the report. These reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

2. The permittee shall notify the Hamilton County Department of Environmental Services of any exceedance of the HAP emissions limitations outlined in T&C A.2.a. If no exceedances occurred, the permittee shall state so in the report. The reports shall be submitted by January 31, April 30, July 31 and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

## E. Testing Requirements

1. Emissions Limitations

   The acid mist emissions shall not exceed 0.038 pound per hour
   The acid mist emissions shall not exceed 0.17 TPY

   Applicable Compliance Methods

   a. if required, compliance with the hourly acid mist emissions limitation shall be demonstrated by inputting actual stack emissions data into the following equation:

      [(ppm)(MW)(dscfm)(60) / (24.45)(453590)(35.3147)] = lbs acid mist

emissions/hr

where:

ppm = the acid mist measured in the exhaust air from the most recent compliance stack test or facility measurement, parts per million
MW = molecular weight of the compound
dscfm = exhaust air flow measured during the most recent compliance stack test or facility measurement, dry standard cubic feet per minute; and

b. if required, compliance with the annual acid mist emissions limitation shall be demonstrated by multiplying the hourly acid mist emissions, as determined in a. by the actual operating hours per year, and divided by 2000 such that the total equals TPY acid mist emissions.

2. Emissions Limitations

The nitrogen oxides (NOx) emissions shall not exceed 1.50 pounds per hour. The NOx emissions shall not exceed 6.57 TPY.

Applicable Compliance Methods

a. if required, compliance with the hourly NOx emissions limitation shall be demonstrated by the NOx emissions information included as part of PTI application 14-05619; and

b. if required, compliance with the annual NOx emissions limitation shall be demonstrated by multiplying the actual hourly NOx emissions rate (lbs NOx/hr) by the actual number of operating hours per year (operating hrs/yr) and by 1 Ton/2000 lbs = TPY NOx.

3. Emissions Limitation

Visible particulate emissions from any stack associated with emissions unit P076 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule

Applicable Compliance Method

If required, compliance shall be determined in accordance with Test Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources"), as such Appendix existed on July 1, 1996.

4. Compliance with the HAP emissions limit in term A.2.a shall be demonstrated by the record keeping in term C.2.

## F. Miscellaneous Requirements

1. Modeling to demonstrate compliance with the Ohio EPA's "Air Toxic Policy" was not necessary because the emissions unit's maximum annual emissions for each toxic compound will be less than 1.0 ton. OAC Chapter 3745-31 requires permittees to apply for and obtain a new or modified permit to install prior to making a "modification" as defined by OAC rule 3745-31-01. The permittee is hereby advised that changes in the composition of the materials, or use of new materials, that would cause the emissions of any pollutant that has a listed TLV to increase to above 1.0 ton per year may require the permittee to apply for and obtain a new permit to install.

2. The terms and conditions in this permit to install shall supercede the terms and conditions in permit to install 14-05619 issued on December 16, 2004.

## PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)

### A. Applicable Emissions Limitations and/or Control Requirements

**1.** The specific operations(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 specified in narrative form following the table.

| Operations, Property, and/or Equipment | Applicable Rules/Requirements | |
|---|---|---|
| P077 - Acid Etch (Etch-11) with NOx scrubber - Modification | OAC rule 3745-31-05(A)(3) | OAC rule 3745-17-07(A)(1) |
| | | OAC rule 3745-17-11(B) |
| | | OAC rule 3745-23-06(B) |
| | OAC rule 3745-31-05(C) (to avoid being subject to OAC rules 3745-31-28 and Title V permitting requirements) | |

| Applicable Emissions Limitations/Control Measures | |
|---|---|
| The acid mist emissions shall not exceed 0.016 pound per hour. | Visible particulate emissions from any stack associated with emissions unit P077 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule. |
| The acid mist emissions shall not exceed 0.070 TPY. | The emission limitation specified by this rule is less stringent than the emission limitation established pursuant to OAC rule 3745-31-05(A)(3). |
| The nitrogen oxides (NOx) emissions shall not exceed 0.66 pound per hour. | See T&C A.2.d |
| The NOx emissions shall not exceed 2.89 TPY | |
| See T&C B.1. - B.4. | |
| The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(C), OAC rule 3745-23-06(B), and OAC rule 3745-17-07(A)(1). | |
| See T&C A.2.a. | |

Emissions Unit ID: **P077**

## 2. Additional Terms and Conditions

**2.a** The actual emissions of Hazardous Air Pollutants (HAPs), as identified in Section 112(b) of Title III of the Clean Air Act from emissions units P001 (Silicon Wafer Manufacturing), P004 (Epitaxial Silicon Wafer Mfg.), P005 (Silicon Wafer Wax mount-removal), P006 (Poly clean Etch Line), P007 Mini-Preclean Line), P008 (Silicon Crystal Formation Process), P009 (Silicone Crystal), P010 (Lapping Process), P012 (Silicone Wafer), P013 (Reactors Process), P014 (Polishing Process), P015 (Final Clean), P016 (Materials Characterization), P017 (Epitaxial Reactor), P020 (Silicon Wafer Mfg.), P021 (ASM Single Wafer Epitaxial Reactor #63), P022 (ASM Single Wafer Epitaxial Reactor #64), P023 (ASM Single Wafer Epitaxial Reactor #65), P024 (E01 - EpiPro Pancake Reactor), P025 (E02 - EpiPro Pancake Reactor), P026 (E03 - EpiPro Pancake Reactor), P027 (E04 - EpiPro Pancake Reactor), P028 (E05 - EpiPro Pancake Reactor), P029 (E06 - EpiPro Pancake Reactor), P030 (E07 - EpiPro Pancake Reactor), P031 (E08 - EpiPro Pancake Reactor), P032 (G01 - Gemini III Pancake Reactor), P033 (G02 - Gemini III Pancake Reactor), P034 (G03 - Gemini III Pancake Reactor), P035 (G04 - Gemini III Pancake Reactor), P036 (A01 - ASM Single Wafer Reactor), P037 (A02 - ASM Single Wafer Reactor), P038 (A03 - ASM Single Wafer Reactor), P039 (A04 - ASM Single Wafer Reactor), P040 (A05 - ASM Single Wafer Reactor), P041 (A06 - ASM Single Wafer Reactor), P042 (A07 - ASM Single Wafer Reactor), P043 (A08 - ASM Single Wafer Reactor), P044 (A09 - ASM Single Wafer Reactor), P045 (A10 - ASM Single Wafer Reactor), P046 (A11 - ASM Single Wafer Reactor), P047 (A12 - ASM Single Wafer Reactor), P048 (A13 - ASM Single Wafer Reactor), P049 (A14 - ASM Single Wafer Reactor), P050 (A15 - ASM Single Wafer Reactor), P051 (B05 - AMT Barrel Reactor), P052 (B06 - AMT Barrel Reactor), P053 (AMT Barrel Reactor), P054 (B08 - AMT Barrel Reactor), P055 (B09 - AMT Barrel Reactor), P056 (B10 - AMT Barrel Reactor), P057 (B11 - AMT Barrel Reactor), P058 (B12 - AMT Barrel Reactor), P059 (B13 - AMT Barrel Reactor), P060 (B14 - AMT Barrel Reactor), P061 (B15 - AMT Barrel Reactor), P062 (B16 - AMT Barrel Reactor), P063 (B17 - AMT Barrel Reactor), P064 (B18 - AMT Barrel Reactor), P065 (B19 - AMT Barrel Reactor), P066 (B20 - AMT Barrel Reactor), P067 (B21 - AMT Barrel Reactor), P068 (B22 - AMT Barrel Reactor), P069 (B23 - AMT Barrel Reactor), P070 (B24 - AMT Barrel Reactor), P071 (B25 - AMT Barrel Reactor), P072 (B26 - AMT Barrel Reactor), P073 (B27 - AMT Barrel Reactor), P074 (B28 - AMT Barrel Reactor), P075 (Exhaust Line

Etch-07, Bell Jar Etch-08, Small Quartz Etch-09), P076 (Acid Etch-10), P077 (Acid Etch-11), P078 (Mounter/Polisher Line 1), and P079 (Acid Etch-11, Side B) shall not exceed 9.9 TPY for any single HAP and 24.9 TPY for any combination of HAPs, including HAP acid mists. Compliance with the above limitations shall be based on rolling, 12-month summations. The permittee has existing records to demonstrate compliance with these limits upon issuance of this permit.

**2.b** The hourly emission limitations outlined in term A.1. are based upon the emissions unit's potential to emit. Therefore, no hourly records are required to demonstrate compliance with these limits.

**2.c** Compliance with OAC rule 3745-31-05(A)(3) shall be demonstrated by the use of a wet scrubber, compliance with the operational restrictions, compliance with the emissions limitations, and compliance with the rolling, 12-month HAPs emissions limitations.

**2.d** The permittee has satisfied the "latest available control techniques and operating practices" required pursuant to OAC rule 3745-23-06(B) by committing to comply with the best available technology requirements established pursuant to OAC rule 3745-31-05(A)(3) in this Permit to Install.

## B. Operational Restrictions

1. The NOx-1 scrubber 1st stage water recirculation flow rate shall be continuously maintained at a value of not less than 85 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber. The NOx-1 scrubber 2nd stage water recirculation flow rate shall be continuously maintained at a value of not less than 120 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber.

2. The NOx-2 scrubber 1st/2nd stage water recirculation flow rate shall be continuously maintained at a value of not less than 300 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber. The NOx-2 scrubber 3rd stage water recirculation flow rate shall be continuously maintained at a value of not less than 200 gallons per minute at all times when emissions from the emissions unit are being vented to the scrubber.

3. The pH of the scrubbing liquor in the NOx-1 scrubber shall be maintained within

the range of 7.5-13.5 at all times when emissions from the emissions unit are being vented to the scrubber.

4. The pH of the scrubbing liquor in the NOx-2 scrubber shall be maintained within the range of 7-13 at all times when emissions from the emissions unit are being vented to the scrubber.

**C. Monitoring and/or Recordkeeping Requirements**

1. The permittee shall properly install, operate and maintain equipment to continuously monitor the scrubber water recirculation flow rate into the NOx-1 and NOx-2 scrubbers and the pH of the scrubber liquor of each scrubber while the emissions unit is in operation. The monitoring devices and any recorders shall be installed, calibrated, operated 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 the NOx-1 and NOx-2 scrubbers:

   a. the scrubber water recirculation flow rate of each stage, in gallons per minute, on a once per day basis;

   b. the pH of the scrubber liquor, on a once per day basis; and

   c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

2. The permittee shall collect and record the following information each month for all the emissions units listed in term A.2.a:

   a. the name and identification number of each HAP-containing material employed;

   b. the individual HAP content for each HAP-containing material employed, *in pounds of individual HAP per material employed;*

   c. the amount of each individual HAP-containing material employed in the manufacturing processes in the units consistent with those in the facility-wide usage tracking tables submitted as part of PTI Application 14-05619, April 4, 2005 in tons per month and tons per 12-month rolling period;

   d. the total combined HAP content for each HAP-containing material employed, in pounds of combined HAP per material employed (sum of all individual OC-HAP contents; sum of all individual hydrochloric acid-HAP contents + the sum of all individual hydrogen fluoride-HAP contents from term b above);

   e. for the entire facility, the total individual HAP emissions from all materials

employed, in tons per month (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

f. for the entire facility, the total combined HAPs emissions from all materials employed, in tons per month (the sum of all HAPs as calculated, (the sum of all HAP, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid -HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary)times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

g. for the entire facility, the updated rolling, 12-month summation of each individual HAP emissions, in tons (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP contents from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months; and

h. for the entire facility, the updated rolling, 12-month summation of total combined HAPs emissions, in tons (the sum of all HAPs, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid-HAP contents from term

d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months.

* A listing of the HAPs can be found in Section 112(b) of the Clean Air Act or can be obtained by contacting your Hamilton County Department of Environmental Services contact. This information does not have to be kept on a individual emissions unit basis.

## D. Reporting Requirements

1. The permittee shall submit quarterly deviation (excursion) reports to the Hamilton County Department of Environmental Services that identify all periods of time during which the following scrubber parameters were not maintained within the requirements of the Operational Restrictions for the NOx-1 and NOx-2 scrubbers:

   a. the scrubber water recirculation flow rate; and

   b. the scrubber solution pH.

   If no exceedances occurred, the permittee shall state so in the report. These reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

2. The permittee shall notify the Hamilton County Department of Environmental Services of any exceedance of the HAP emissions limitations outlined in T&C A.2.a. If no exceedances occurred, the permittee shall state so in the report. The reports shall be submitted by January 31, April 30, July 31 and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

## E. Testing Requirements

1. Emissions Limitations

The acid mist emissions shall not exceed 0.016 pounds per hour.
The acid mist emissions shall not exceed 0.070 TPY.

Applicable Compliance Methods

a. if required, compliance with the hourly acid mist emissions limitation shall be demonstrated by inputting actual stack emissions data into the following equation:

[(ppm)(MW)(dscfm)(60) / (24.45)(453590)(35.3147)] = lbs acid mist emissions/hr

where:

ppm = the acid mist measured in the exhaust air from the most recent compliance stack test or facility measurement, parts per million
MW = molecular weight of the compound
dscfm = exhaust air flow measured during the most recent compliance stack test or facility measurement, dry standard cubic feet per minute; and

b. if required, compliance with the annual acid mist emissions limitation shall be demonstrated by multiplying the hourly acid mist emissions, as determined in a. by the actual operating hours per year, and divided by 2000 such that the total equals TPY acid mist emissions.

Emissions Unit ID: **P077**

2. Emissions Limitations

The nitrogen oxides (NOx) emissions shall not exceed 0.66 pound per hour. The NOx emissions shall not exceed 2.89 TPY.

Applicable Compliance Methods

a. if required, compliance with the hourly NOx emissions limitation shall be demonstrated by the NOx emissions information included as part of PTI application 14-05619; and

b. if required, compliance with the annual NOx emissions limitation shall be demonstrated by multiplying the actual hourly NOx emissions rate (lbs NOx/hr) by the actual number of operating hours per year (operating hrs/yr) and by 1 Ton/2000 lbs = TPY NOx.

3. Emissions Limitation

Visible particulate emissions from any stack associated with emissions unit P077 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule.

Applicable Compliance Method

If required, compliance shall be determined in accordance with Test Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources"), as such Appendix existed on July 1, 1996.

4. Compliance with the HAP emissions limit in term A.2.a shall be demonstrated by the record keeping in term C.2.

**F. Miscellaneous Requirements**

1. Modeling to demonstrate compliance with the Ohio EPA's "Air Toxic Policy" was not necessary because the emissions unit's maximum annual emissions for each toxic compound will be less than 1.0 ton. OAC Chapter 3745-31 requires permittees to apply for and obtain a new or modified permit to install prior to making a "modification" as defined by OAC rule 3745-31-01. The permittee is hereby advised that changes in the composition of the materials, or use of new materials, that would cause the emissions of any pollutant that has a listed TLV

to increase to above 1.0 ton per year may require the permittee to apply for and obtain a new permit to install.

2. The terms and conditions in this permit to install shall supercede the terms and conditions in permit to install 14-05619 issued on December 16, 2004.

**PART II - SPECIAL TERMS AND CONDITIONS FOR SPECIFIC EMISSIONS UNIT(S)**

**A. Applicable Emissions Limitations and/or Control Requirements**

**1.** The specific operations(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 specified in narrative form following the table.

| Operations, Property, and/or Equipment | Applicable Rules/Requirements | rules 3745-31-28 and Title V permitting requirements) |
|---|---|---|
| P078 - Mounter/Polisher Line 1 (MP1) with Fume Scrubbers S-01 and S-06 - Modification. | OAC rule 3745-31-05(A)(3) | |
| | OAC rule 3745-31-05(C) (to avoid being subject to OAC | |

| Applicable Emissions Limitations/Control Measures |
|---|
| The ammonia emissions shall not exceed 0.08 pound per hour. |
| The ammonia emissions shall not exceed 0.35 TPY. |
| The organic compounds (OC) emissions shall not exceed 0.975 pound per hour. |
| The OC emissions shall not exceed 4.27 TPY. |
| The requirements of this rule also include compliance with the requirements of OAC rule 3745-31-05(C) and OAC rule 3745-17-07(A)(1). |
| See T&C A.2.a. |

Emissions Unit ID: **P078**

## 2. Additional Terms and Conditions

**2.a** The actual emissions of Hazardous Air Pollutants (HAPs), as identified in Section 112(b) of Title III of the Clean Air Act from emissions units P001 (Silicon Wafer Manufacturing), P004 (Epitaxial Silicon Wafer Mfg.), P005 (Silicon Wafer Wax mount-removal), P006 (Poly clean Etch Line), P007 Mini-Preclean Line), P008 (Silicon Crystal Formation Process), P009 (Silicone Crystal), P010 (Lapping Process), P012 (Silicone Wafer), P013 (Reactors Process), P014 (Polishing Process), P015 (Final Clean), P016 (Materials Characterization), P017 (Epitaxial Reactor), P020 (Silicon Wafer Mfg.), P021 (ASM Single Wafer Epitaxial Reactor #63), P022 (ASM Single Wafer Epitaxial Reactor #64), P023 (ASM Single Wafer Epitaxial Reactor #65), P024 (E01 - EpiPro Pancake Reactor), P025 (E02 - EpiPro Pancake Reactor), P026 (E03 - EpiPro Pancake Reactor), P027 (E04 - EpiPro Pancake Reactor), P028 (E05 - EpiPro Pancake Reactor), P029 (E06 - EpiPro Pancake Reactor), P030 (E07 - EpiPro Pancake Reactor), P031 (E08 - EpiPro Pancake Reactor), P032 (G01 - Gemini III Pancake Reactor), P033 (G02 - Gemini III Pancake Reactor), P034 (G03 - Gemini III Pancake Reactor), P035 (G04 - Gemini III Pancake Reactor), P036 (A01 - ASM Single Wafer Reactor), P037 (A02 - ASM Single Wafer Reactor), P038 (A03 - ASM Single Wafer Reactor), P039 (A04 - ASM Single Wafer Reactor), P040 (A05 - ASM Single Wafer Reactor), P041 (A06 - ASM Single Wafer Reactor), P042 (A07 - ASM Single Wafer Reactor), P043 (A08 - ASM Single Wafer Reactor), P044 (A09 - ASM Single Wafer Reactor), P045 (A10 - ASM Single Wafer Reactor), P046 (A11 - ASM Single Wafer Reactor), P047 (A12 - ASM Single Wafer Reactor), P048 (A13 - ASM Single Wafer Reactor), P049 (A14 - ASM Single Wafer Reactor), P050 (A15 - ASM Single Wafer Reactor), P051 (B05 - AMT Barrel Reactor), P052 (B06 - AMT Barrel Reactor), P053 (AMT Barrel Reactor), P054 (B08 - AMT Barrel Reactor), P055 (B09 - AMT Barrel Reactor), P056 (B10 - AMT Barrel Reactor), P057 (B11 - AMT Barrel Reactor), P058 (B12 - AMT Barrel Reactor), P059 (B13 - AMT Barrel Reactor), P060 (B14 - AMT Barrel Reactor), P061 (B15 - AMT Barrel Reactor), P062 (B16 - AMT Barrel Reactor), P063 (B17 - AMT Barrel Reactor), P064 (B18 - AMT Barrel Reactor), P065 (B19 - AMT Barrel Reactor), P066 (B20 - AMT Barrel Reactor), P067 (B21 - AMT Barrel Reactor), P068 (B22 - AMT Barrel Reactor), P069 (B23 - AMT Barrel Reactor), P070 (B24 - AMT Barrel Reactor), P071 (B25 - AMT Barrel Reactor), P072 (B26 - AMT Barrel Reactor), P073 (B27 - AMT Barrel Reactor), P074 (B28 - AMT Barrel Reactor), P075 (Exhaust Line

Etch-07, Bell Jar Etch-08, Small Quartz Etch-09), P076 (Acid Etch-10), P077 (Acid Etch-11), P078 (Mounter/Polisher Line 1), and P079 (Acid Etch-11, Side B) shall not exceed 9.9 TPY for any single HAP and 24.9 TPY for any combination of HAPs, including HAP acid mists. Compliance with the above limitations shall be based on rolling, 12-month summations. The permittee has existing records to demonstrate compliance with these limits upon issuance of this permit.

**2.b** The hourly emission limitations outlined in term A.1. are based upon the emissions unit's potential to emit. Therefore, no hourly records are required to demonstrate compliance with these limits.

**2.c** Compliance with OAC rule 3745-31-05(A)(3) shall be demonstrated by the use of a wet scrubber, compliance with the operational restrictions, compliance with the emissions limitations, and compliance with the rolling, 12-month HAPs emissions limitations.

## B. Operational Restrictions

1. The S-01 scrubber water recirculation flow rate shall be continuously maintained at a value of not less than 125 gallons per minute at all times while the emissions unit is in operation.

2. The pH of the S-01 scrubber liquor shall be maintained within the range of 8-13 at all times while the emissions unit is in operation.

3. The S-06 scrubber water recirculation flow rate shall be continuously maintained at a value of not less than 60 gallons per minute at all times while the emissions unit is in operation.

4. The pH of the S-06 scrubber liquor shall be maintained within the range of 2-6 at all times while the emissions unit is in operation.

## C. Monitoring and/or Recordkeeping Requirements

1. The permittee shall properly install, operate and maintain equipment to continuously monitor the scrubber water recirculation flow rate into the scrubbers and the pH of the scrubber liquors while the emissions unit is in operation. The monitoring devices and any recorders shall be installed, calibrated, operated and maintained in accordance with the manufacturer's recommendations, instructions and operating manuals.

2. The permittee shall collect and record the following information each day for scrubbers S-01 and S-06:

   a. the scrubber water recirculation flow rate, in gallons per minute, on a once per day basis;

   b. the pH of the scrubber liquor, on a once per day basis; and

   c. the operating times for the capture (collection) system, control device, monitoring equipment, and the associated emissions unit.

3. The permittee shall collect and record the following information each month for all the emissions units listed in term A.2.a:

   a. the name and identification number of each HAP-containing material employed;

   b. the individual HAP content for each HAP-containing material employed, in pounds of individual HAP per material employed;

   c. the amount of each individual HAP-containing material employed in the manufacturing processes in the units consistent with those in the facility-wide usage tracking tables submitted as part of PTI Application 14-05619, April 4, 2005 in tons per month and tons per 12-month rolling period;

   d. the total combined HAP content for each HAP-containing material employed, in pounds of combined HAP per material employed (sum of all individual OC-HAP contents; sum of all individual hydrochloric acid-HAP contents + the sum of all individual hydrogen fluoride-HAP contents from term b above);

   e. for the entire facility, the total individual HAP emissions from all materials employed, in tons per month (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

f. for the entire facility, the total combined HAPs emissions from all materials employed, in tons per month (the sum of all HAPs as calculated, (the sum of all HAP, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid -HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary)times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed.);

g. for the entire facility, the updated rolling, 12-month summation of each individual HAP emissions, in tons (the sum of each HAP, as calculated, by summing the following: each individual OC-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) + each individual hydrochloric acid-HAP content from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + each individual hydrogen fluoride-HAP contents from term b times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months; and

h. for the entire facility, the updated rolling, 12-month summation of total combined HAPs emissions, in tons (the sum of all HAPs, as calculated, by summing the following: all the combined OC-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) + all the combined hydrochloric acid-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed + all the combined hydrogen fluoride-HAP contents from term d times term c times the emission factor, in the appropriate units (if necessary) times 1-control efficiency of the control device employed). This shall include the information for the current month and the preceding eleven calender months.

* A listing of the HAPs can be found in Section 112(b) of the Clean Air Act or can

be obtained by contacting your Hamilton County Department of Environmental Services contact. This information does not have to be kept on a individual emissions unit basis.

4. The permit to install for emissions unit P078 was evaluated based on the actual materials (typically coatings and cleanup materials) and the design parameters of the emissions unit's exhaust system, as specified by the permittee in the permit to install application. The Ohio EPA's "Review of New Sources of Air Toxic Emissions" policy ("Air Toxic Policy") was applied for each 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 Ground-Level Concentration (MAGLC).

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

   Pollutant: MEK

   TLV (ug/m3): 589,770

   Maximum Hourly Emission Rate (lbs/hr): 0.48

   Predicted 1-Hour Maximum Ground-Level Concentration (ug/m3): 30

   MAGLC (ug/m3): 14,042

   Physical changes to or in the method of operation of the emissions unit after it's 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 Toxic Policy" will still be satisfied. If, upon evaluation, the permittee determines that the "Air Toxic Policy" will not be satisfied, the permittee will not make the change. Changes that can affect the parameters used in the "Air Toxic Policy" include the following:

   a. changes in the composition of the materials used (typically for coatings or cleanup materials), 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 Toxic Policy" will be satisfied for the above changes, the Ohio EPA will not consider the change(s) to be a "modification" under OAC rule 3745-31-01 solely due to the emissions of any type of toxic air contaminant not previously emitted, and a modification of the existing permit to install will not be required, even if the toxic air contaminant emissions are greater than the de minimis level in OAC rule 3745-15-05. If the change(s) is (are) defined as a modification under other provisions of the modification definition, 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 Toxic Policy:"

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

b. documentation of it's evaluation and determination that the changed emissions unit still satisfies the "Air Toxic Policy"; and

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

## D. Reporting Requirements

1. The permittee shall submit quarterly deviation (excursion) reports to the Hamilton County Department of Environmental Services that identify all periods of time during which the following scrubber parameters were not maintained within the requirements of the Operational Restrictions for scrubbers S-01 and S-06:

   a. the scrubber water recirculation flow rate; and

b. the scrubber solution pH.

If no exceedances occurred, the permittee shall state so in the report. These reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

2. The permittee shall notify the Hamilton County Department of Environmental Services of any exceedance of the HAP emissions limitations outlined in T&C A.2.a. If no exceedances occurred, the permittee shall state so in the report. The reports shall be submitted by January 31, April 30, July 31 and October 31 of each year and shall cover the previous calendar quarters (October through December, January through March, April through June and July through September, respectively).

## E. Testing Requirements

1. Emissions Limitations

The ammonia emissions shall not exceed 0.08 pound per hour.
The ammonia emissions shall not exceed 0.35 TPY.

Applicable Compliance Methods

a. if required, compliance with the hourly ammonia emissions limitation shall be demonstrated by the ammonia emissions information included as part of PTI application 14-05619; and

b. if required, compliance with the annual ammonia emissions limitation shall be demonstrated by multiplying the actual hourly ammonia emissions rate (lbs ammonia/hr) by the actual number of operating hours per year (operating hrs/yr) and by 1 Ton/2000 lbs = TPY ammonia.

2. Emissions Limitations

The organic compounds (OC) emissions shall not exceed 0.975 pound per hour
The OC emissions shall not exceed 4.27 TPY

Applicable Compliance Methods

a. if required, compliance with the hourly OC emissions limitation shall be

demonstrated by a summation of the following:

i. for emissions from the mounting wax, emissions shall be calculated by multiplying the actual mounting wax application rate (gal wax/hour) x actual mounting wax density (lb wax/gal wax) x OC concentration (lb OC/lb wax) = lbs OC emissions/hr; and

ii. for emissions from the use of stripper in the plate cleaning and supplemental plate sections, emissions shall be calculated by multiplying the actual stripper application rate (lb stripper/hour) x OC concentration (lb OC/lb stripper) = lbs OC emissions/hr

b. if required, compliance with the annual OC emissions limitation shall be demonstrated by a summation of the following:

i. for emissions from the mounting wax, emissions shall be calculated by multiplying the actual mounting wax application rate (gal wax/year) x actual mounting wax density (lb wax/gal wax) x OC concentration (lb OC/lb wax) and by 1 Ton/2000 lbs = TPY OC emissions; and

ii. for emissions from the use of stripper in the plate cleaning and supplemental plate sections, emissions shall be calculated by multiplying the actual stripper application rate (lb stripper/year) x OC concentration (lb OC/lb stripper) and by 1 Ton/2000 lbs = TPY OC *emissions*

3. Emissions Limitation

Visible particulate emissions from any stack associated with emissions unit P078 shall not exceed 20 percent opacity, as a six-minute average, except as specified by rule

Applicable Compliance Method

If required, compliance shall be determined in accordance with Test Method 9 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources"), as such Appendix existed on July 1, 1996.

4. Compliance with the HAP emissions limit in term A.2.a shall be demonstrated by the record keeping in term C.3.

## F. Miscellaneous Requirements

1. The terms and conditions in this permit to install shall supercede the terms and conditions in permit to install 14-05619 issued on December 16, 2004.