

AIR EMISSION PERMIT NO. 08500032- 001

IS ISSUED TO

Hutchinson Technology Inc.

Hutchinson Technology Inc. - Hutchinson
40 West Highland Park
Hutchinson, McLeod County, MN 55350-9784

The emission units, control equipment and emission stacks at the stationary source authorized in this permit are as described in the following permit application(s):

Permit Type	Application Date
Total Facility Operating Permit	Received May 15, 1995, July 25, 1996, November 10, 1997, and February 9, 1998

This permit authorizes the Permittee to modify, construct, and operate the stationary source at the address listed above unless otherwise noted in Table A. The Permittee must comply with all the conditions of the permit. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit are as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

Permit Type: Federal; Limits to Avoid NSR and Part 63

Issue Date: March 4, 2002

Expiration: March 4, 2007
All Title I Conditions do not expire.

Ann M. Foss
Major Facilities Section Manager
Major and Remediation Division

for Karen A. Studders
Commissioner
Minnesota Pollution Control Agency

TRW:kmt

TABLE OF CONTENTS

Notice to the Permittee

Permit Shield

Facility Description

Table A: Limits and Other Requirements

Table B: Submittals

Appendix: Emission Calculation Primer

NOTICE TO THE PERMITTEE:

Your stationary source may be subject to the requirements of the Minnesota Pollution Control Agency's (MPCA) solid waste, hazardous waste, and water quality programs. If you wish to obtain information on these programs, including information on obtaining any required permits, please contact the MPCA general information number at:

Metro Area	(651) 296-6300
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Outside Metro Area	1-800-657-3864
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TTY	(651) 282-5332
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The rules governing these programs are contained in Minn. R. chs. 7000-7105. Written questions may be sent to: Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

Questions about this air emission permit or about air quality requirements can also be directed to the telephone numbers and address listed above.

PERMIT SHIELD:

Subject to the limitations in Minn. R. 7007.1800, compliance with the conditions of this permit shall be deemed compliance with the specific provision of the applicable requirement identified in the permit as the basis of each condition. Subject to the limitations of Minn. R. 7007.1800 and 7017.0100, subp. 2, notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements.

FACILITY DESCRIPTION:

Hutchinson Technology, Inc. (HTI) is a manufacturer of suspension assemblies for all sizes of computer disk drives. The suspension assembly holds the read/write head at extremely small distances above the spinning disks. HTI currently holds about 50 percent of the world market, with its only competitors being in Asia. Two types of suspension assemblies are made, conventional and TSA (suspensions incorporating integrated electrical leads). The TSA product will eventually become the core product manufactured by the company.

The high tech market HTI is in can prove to be very volatile. Sales of all types of suspension assemblies from HTI have increased at rates greater than 25 percent per year over the last five years. Most products in this industry usually only have lifetimes of about three years. Because of this volatility, HTI needs to have a permit that is as flexible as possible so that it can respond quickly to changing market demands.

The significant emission sources at the facility are all evaporative and include: the photoetching solutions, and the many different cleaning solvents used throughout all areas of the plant. About 75 percent of the volatile organic compound emissions at the facility are emitted during the application of the photoresist solution by either the two roller coaters or the two dip coaters. The roller coaters are vented through a hood to a thermal oxidizer while the dip coaters are vented to a process boiler.

Other emission units at the facility are controlled as well. The air from the plasma etching solutions is vented to a scrubber to remove HF. Other evaporative sources such as the cleanlines and strippers have spray nozzles in the exhaust vents that spray water countercurrent to the exhaust gas flow. Testing has not been done to determine the control efficiencies of the spray nozzles, so the control efficiency is not claimed by the facility. The HF scrubber, the thermal oxidizer and boiler control efficiency have all been tested and their control efficiencies have been claimed in the permit.

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Table A contains limits and other requirements with which your facility must comply. The limits are located in the first column of the table (What To do). The limits can be emission limits or operational limits. This column also contains the actions that you must take and the records you must keep to show that you are complying with the limits. The second column of Table A (Why to do it) lists the regulatory basis for these limits. Appendices included as conditions of your permit are listed in Table A under total facility requirements.

Subject Item:**Total Facility**

What to do	Why to do it
GENERAL REQUIREMENTS	hdr
Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. Include in the plan a list of corrective actions that will be taken if any of the pollution control equipment monitored parameters are out of their proper operating ranges.	Minn. R. 7007.0800, subp. 14 and Minn. R. 7007.0800, subp. 16(J)
Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.	Minn. R. ch. 7017
Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as specified by Minn. R. 7017.2025 following formal review of a subsequent performance test on the same unit.	Minn. R. 7017.2025
Monitoring Equipment: Install or make needed repairs to monitoring equipment within 60 days of issuance of the permit if monitoring equipment is not installed and operational on the date the permit is issued.	Minn. R. 7007.0800, subp. 4(D)
Monitoring Equipment Calibration: Annually calibrate all required monitoring equipment (any requirements applying to continuous emission monitors are listed separately in this permit).	Minn. R. 7007.0800, subp. 4(D)
Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system.	Minn. R. 7007.0800, subp. 4(D)
Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted.	Minn. R. 7011.0020
Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 3. At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over.	Minn. R. 7019.1000, subp. 3
Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over.	Minn. R. 7019.1000, subp. 2
Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.	Minn. R. 7019.1000, subp. 1

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.	Minn. R. 7019.1000, subp. 1
Operation Changes: In any shutdown, breakdown, or deviation the Permittee shall immediately take all practical steps to modify operations to reduce the emissions of any regulated air pollutant. The Commissioner may require feasible and practical modifications in the operation to reduce emissions of air pollutants. No emission units that have an unreasonable shutdown or breakdown frequency of process or control equipment shall be permitted to operate.	Minn. R. 7019.1000, subp. 4
Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated, unless otherwise noted in Table A.	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)
Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150.	Minn. R. 7011.0150
Application for Permit Amendment: If a permit amendment is needed, submit an application in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500. Submittal dates vary, depending on the type of amendment needed.	Minn. R. 7007.1150 through Minn. R. 7007.1500
Extension Requests: The Permittee may apply for an Administrative Amendment to extend a deadline in a permit by no more than 120 days, provided the proposed deadline extension meets the requirements of Minn. R. 7007.1400, subp. 1(H).	Minn. R. 7007.1400, subp. 1(H)
Record keeping: Retain all records at the stationary source for a period of five (5) years from the date of monitoring, sample, measurement, or report. Records which must be retained at this location include all calibration and maintenance records, all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A).	Minn. R. 7007.0800, subp. 5(C)
Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not federally enforceable.	Minn. R. 7030.0010 - 7030.0080
The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
Inspections: Upon presentation of credentials and other documents as may be required by law, allow the Agency, or its representative, to enter the Permittee's premises to have access to and copy any records required by this permit, to inspect at reasonable times (which include any time the source is operating) any facilities, equipment, practices or operations, and to sample or monitor any substances or parameters at any location.	Minn. R. 7007.0800, subp. 9(A)
Emission Fees: due 60 days after receipt of an MPCA bill.	Minn. R. 7002.0005 through Minn. R. 7002.0095
FACILITY SPECIFIC REQUIREMENTS	hdr
This permit establishes limits on the facility to keep it a non-major source under New Source Review. The Permittee shall not make any changes at the source that would make the source a major source under New Source Review until a major permit amendment has been issued. This includes changes that might otherwise qualify as insignificant modifications and minor or moderate amendments.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21; Minn. R. 7007.0800, subp. 2
Environmental Review: the Permittee shall not begin construction of any single project or projects that are connected or phased, which will cause a total increase in actual emissions of greater than 99 tons per year for any criteria pollutant, without first getting a permit amendment to authorize the project. Connected and phased have meanings as defined in Minn. R. 4410.0200 subps. 9b and 60. The Permittee shall not begin construction of any project which is listed in Minn. R. 4410.4300 or Minn. R. 4410.4400 without first obtaining a permit amendment to authorize the project. Such project(s) may require the completion of an Environmental Assessment Worksheet or an Environmental Impact Statement prior to issuance of the amendment.	Minn. R. 4410.4300 and Minn. R. 4410.4400
Labeling Requirements: the Permittee shall label all emission units at the stationary source that are in groups (GP) 001-007 with their respective EU and GP numbers within 60 days after permit issuance. The EU and GP number labels on each emission unit shall be permanent and readily visible from a distance. The letters shall be at least 3 inches in height.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Equipment Inventory List: the Permittee shall maintain a written list that identifies all emission units at the facility and the group (i.e. GP 001-007 or insignificant) that the emission unit belongs. The list shall include the EU and GP numbers, the emission unit name, the type of equipment, and the date(s) of installation and modification/reconstruction.	Minn. R. 7007.0800, subp. 5
Submit: due 91 days after end of each calendar year following Permit Issuance (April 1) the Equipment Inventory List.	Minn. R. 7007.0800, subp. 6
Updating the Equipment Inventory List: the list shall be updated to include any new, modified, or changed equipment before installing any new equipment, or making a change or modification (as defined at Minn. R. 7007.0100, subp. 14) to existing equipment. A dated, written record of the following four (4) determinations shall be made before each modification or change: 1) Determine Pollution Prevention measures applicable to the proposed modification or change; 2) Determine if any other applicable requirements would be triggered, other than those included in this permit; 3) Examine the MSDS for all new materials used on site for VOC and/or HAP content, and determine whether all emissions from the new material can be tracked by any of the methods specified in the Groups in this permit. 4) Determine whether all applicable total facility 12-month rolling sum limits for VOC, HAP, PM, PM10, NOx, CO, SO2, single HAP, and total HAP will be met.	Minn. R. 7007.0800, subp. 5
(continued) If the answer is "yes" to item number two, or "no" to either items number three or four, then you must obtain the appropriate amendment to this permit (as described at Minn. R. 7007.1150 through 1500) before you commence construction on the modification or change. If the change involves a change that qualifies as an insignificant modification (Minn. R. 7007.1250), only the first two (2) determinations above must be made and recorded.	Minn. R. 7007.0800, subp. 5
Addition/Modification of Emission Units: The Permittee may add emission units to the stationary source that are either: 1) described in GP 001 through GP 007, or 2) qualify as an insignificant modification (as described in Minn. R. 7007.1250). When adding new emission units to GP 001 through GP 007 the emissions from these emission units must be able to be calculated according to the procedure for the appropriate Group (as described in this permit and its appendices). The addition of new emission units which do not fit into an existing Group, and are not insignificant modifications, must follow the permit amendment procedures at Minn. R. 7007.1150 through 1500. The specific emission units at this stationary source may be modified, but the changed stationary source must meet all conditions in this permit at all times.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Insignificant Modifications Recordkeeping: The potential emissions of all criteria pollutants emitted from emission units which are added and qualify as insignificant modifications (Minn. R. 7007.1250) must be recorded and kept on file at the facility. A list of insignificant emission units must be included as a part of the equipment inventory list. The cumulative total of potential criteria emissions from all insignificant modifications must be determined each time a subsequent insignificant modification is made. If the addition of new emission units cause the cumulative total of emissions from all insignificant modifications, for ANY criteria pollutant to be greater than: 1) four times the amount listed in Minn. R. 7007.1250, subp. 1(B)(2), on annual basis, or 2) 15 tons per year for Total Particulate Matter, the Permittee shall apply for a major amendment to this permit to adjust the allocation of emissions for ALL criteria pollutants under their respective Total Facility Caps.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
(continued) After the adjustment is made, and the amendment is issued, the cumulative totals for potential emissions from insignificant activities for ALL criteria pollutants will be reset to zero and will begin accumulating again with the next insignificant modification. An emission unit that emits HAP can NOT be added as an insignificant activity, but may be able to be added under an existing permit group.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
Emissions Monitoring and Recordkeeping: by the 15th day of each month calculate and record: 1) emissions of each pollutant from each Group for the previous month, using the methods described in this permit and Appendix A of this permit; 2) total facility monthly emissions of each pollutant by summing the monthly emissions of each pollutant from each Group (calculated above in item 1); 3) 12-month rolling sum emissions for each pollutant by summing the total facility monthly emissions of each pollutant (calculated above in item 2) and add it to the total from the previous 11 months. To calculate a 12-month rolling sum during the first eleven months after permit issuance, use historical operating records to determine monthly emissions of each pollutant for each month in the 12-month rolling sum period prior to permit issuance.	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subps. 4 and 5
Total Particulate Matter: less than or equal to 249 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 234 tons per year for GP 001-007 and 15 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 52.21

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Particulate Matter < 10 micron: less than or equal to 249 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 234 tons per year for GP 001-007 and 15 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 52.21
Nitrogen Oxides: less than or equal to 249 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 209 tons per year for GP 001-007 and 40 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 52.21
Sulfur Dioxide: less than or equal to 249 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 209 tons per year for GP 001-007 and 40 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 52.21
Carbon Monoxide: less than or equal to 249 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 149 tons per year for GP 001-007 and 100 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 52.21
Volatile Organic Compounds: less than or equal to 225 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 185 tons per year for GP 001-007 and 40 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 52.21
HAP-Single: less than or equal to 4.9 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 4.9 tons per year for GP 001-007 and 0 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 63.2
HAPs - Total: less than or equal to 19.9 tons/year using 12-month Rolling Sum for the total facility. This total shall be allocated as such: 19.9 tons per year for GP 001-007 and 0 tons per year for Insignificant Modifications.	Title I Condition: limit taken to avoid classification as a major source under 40 CFR Section 63.2
Recordkeeping: maintain a record of the material safety data sheets (MSDS) for each VOC- or HAP- containing material currently used at the facility. Maintain a record of the material safety data sheets (MSDS) for each VOC- or HAP- containing material previously used at the facility for a period of 5 years from the date the material was last used.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: GP 001 Photoresist Coaters**Associated Items:** EU 001 Dipper 1

EU 002 Dipper 2

EU 003 Roller Coater 1

EU 088 Roller Coater 2

What to do	Why to do it
GP 001 emission units are limited to coaters that use materials containing VOC and HAP (e.g. photoresist).	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Daily Recordkeeping: Record separately for each dip coater and each roller coater, the volume of each VOC- and HAP-containing material added to the coater, when the material is taken from the central storage area. On any day that coater waste is shipped off-site, record the volume of the shipment. By the 15th day of the month calculate and record the mass of VOC and each HAP in the coater waste shipments for the previous month. Note: In order to calculate the mass of VOC and HAP in coater waste shipped off-site, the VOC and HAP content of the coater waste material must be equivalent to the VOC and HAP content in the virgin material (wastes with different VOC and HAP content can not be mixed together).	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
(continued) If different wastes were mixed, the Permittee must sample from each drum and analyze the waste to determine VOC and HAP content (according to EPA or ASTM methods), in order to receive credit for the mass of VOC and HAP in recycled/recovered waste; or, the Permittee must use the lowest MSDS values of VOC and HAP of the materials that comprise mixed wastes.	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
Monthly Recordkeeping: by the 15th day of each month calculate and record the following data separately for the roller coaters and for the dip coaters: 1) the total quantity of each type of VOC- and HAP-containing material used during the previous month; 2) the uncontrolled emissions during the previous month of VOC, Toluene, and Xylene (and any other HAP listed on the MSDS), based on the quantity of each type of VOC- and HAP-containing material used during the previous month, and the maximum percentage of each VOC and HAP component (stated on the relevant MSDS); 3) the mass of VOC and each HAP in coater waste shipped during the previous month; In addition, by the 15th day of each month calculate and record:	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
(continued) 4) GP 001 VOC and individual HAP emissions during the previous month based on: the uncontrolled emissions (determined in item two), minus waste shipped (determined in item three) 5) apply 84% VOC control efficiency to the emissions from the roller coaters 6) apply 42% VOC control efficiency to the emissions from the dip coaters For items 5) and 6) use the control efficiency values stated, or the values from the most recent performance test. See Appendix A for additional information on these emission calculations. During any bypass of control equipment, record the material usage during the bypass and then do not apply the control efficiency for this amount of material usage when doing the emission calculations.	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: GP 002 Conventional Strippers

Associated Items: EU 016 Blueline Stripper

EU 018 Vertical Stripper 2

EU 019 Vertical Stripper 3

EU 080 Vertical Stripper 4

EU 081 Vertical Stripper 6

EU 084 Vertical Stripper 9

What to do	Why to do it
GP 002 emission units are limited to units that utilize materials containing VOC and HAP.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
The glycol ether emission factor is 0.0023 lb/operating-hr. The MEA emission factor is 0.24 lb/operating-hr for EU016. The MEA emission factor is 0.13 lb/operating-hr for the remaining emission units in GP 002. These emission factors apply unless otherwise recalculated per procedure below.	Minn. R. 7007.0800, subp. 2
Glycol Ethers: less than or equal to 0.006 mole fraction in bath solution. MEA: less than or equal to 0.0049 mole fraction in bath solution. These concentrations apply unless otherwise changed per procedure below.	Title I Condition: limit to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 2
Temperature: less than or equal to 125 degrees F using Other ; as a 5-day rolling average of readings taken once each operating day, for each of the non-HCl stripper sumps.	Title I Condition: limit to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Recordkeeping: once each day, record the hours each emission unit was operated during the previous day. By the 15th day of each month, calculate and record: 1) GP 002 operating hours for the previous month; 2) GP 002 VOC and individual HAP emissions using monthly operating hours calculated in item one, and emission factors specified in GP 002.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
Any of the following events requires the Permittee to recalculate the GP 002 emissions factors: 1) the temperature any of the non-HCl stripper sumps exceeding the permitted limit for GP 002; 2) any change (i.e. to the ductwork or fan) that increases airflow above the bath; 3) the mole fraction concentration of the VOC/HAP component in the bath solution exceeding the permitted concentration for GP 002. The emission factor shall be recalculated on the date the event occurs.	Title I Condition: to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Emission Factor Recalculation: When necessary the Permittee shall recalculate GP 002 emission factor as follows: 1) determine the vapor pressure of the pure VOC/HAP component at the sump temperature using data from the MSDS and/or standard chemical engineering reference texts 2) use Raoult's Law to determine the partial pressure of the VOC/HAP component at the concentration used in the sumps 3) calculate the mole fraction of the VOC/HAP component in the overlying air 4) calculate the new emission factor by using the design airflow and the molar volume of an ideal gas at the sump temperature 5) maintain records of these calculations on site.	Title I Condition: to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 5
Corrective Action: if any 5-day rolling average sump temperature exceeds the maximum permitted value, take corrective action according to the O&M Plan, to reduce the temperature to at least the permitted maximum value. Record all corrective actions taken when completed.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subps. 5 and 14
Monitoring and Recordkeeping: when each sump solution is made, calculate and record the glycol ether, MEA, and HCl concentration in units of mole fraction for glycol ether and MEA, and percent by weight for HCl.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4; Minn. R. 7007.0800, subp. 5
Monitoring: the Permittee shall install the necessary monitoring equipment for measuring and recording the temperature as required by this permit, if not already present. The monitoring equipment must be installed, in use, and properly maintained when the cleanlines are in operation.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Monitoring: once each day, observe and record the temperature in the sump, during operation of GP 002 emission unit(s), and calculate and record the 5-day rolling average temperature, as described in Appendix A of this permit.	Title I Condition: monitoring to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4
Recordkeeping: the Permittee shall maintain a hard copy on site of the daily and 5-day rolling average temperatures.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
Emission Factor Engineering Test: conduct this test according to the "Stripper Air Emissions Work Plan" attached to the Technical Support Document, and submit the test report to the MPCA within 180 days after permit issuance. Should the results of the Test show that the approach used to calculate air emissions from these emission units is not conservative, the Permittee shall submit a major amendment to change the emission calculation approach for GP002, GP003 and any unit considered an insignificant activity where a similar calculation approach was taken. This amendment shall be submitted within 60 days of the date the test report was submitted to the MPCA.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: GP 003 TSA (Trace) Strippers**Associated Items:** EU 082 Vertical Stripper 7

EU 083 Vertical Stripper 8

EU 119 Vertical Stripper 5

What to do	Why to do it
GP 003 emission units are limited to units that utilize materials containing VOC and HAP.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
The MEA emission factor is 1.1 lb/operating-hr.	Minn. R. 7007.0800, subp. 2
MEA: less than or equal to 1.6 mole/L in bath solution.	Title I Condition: limit to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 2
Temperature: less than or equal to 140 degrees F using Other ; as a 5-day rolling average of readings taken once each operating day, for each of the non-HCl stripper sumps.	Title I Condition: limit to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Recordkeeping: once each day, record the hours each emission unit was operated during the previous day. By the 15th day of each month, calculate and record: 1) GP 003 operating hours for the previous month; 2) GP 003 VOC and individual HAP emissions using monthly operating hours calculated in item one, and emission factors specified in GP 003.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
Any of the following events requires the Permittee to recalculate the GP 003 emissions factors: 1) the temperature of any of the non-HCl stripper sumps exceeding the permitted limit for GP 003; 2) any change (i.e. to the ductwork or fan) that increases airflow above the bath; 3) a mole fraction concentration of the VOC/HAP component in the bath solution exceeding the permitted concentration for GP 003. The emission factor shall be recalculated on the date the event occurs.	Title I Condition: to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Emission Factor Recalculation: When necessary the Permittee shall recalculate GP 003 emission factor as follows: 1) determine the vapor pressure of the pure VOC/HAP component at the sump temperature using data from the MSDS and/or standard chemical engineering reference texts 2) use Raoult's Law to determine the partial pressure of the VOC/HAP component at the concentration used in the sumps 3) calculate the mole fraction of the VOC/HAP component in the overlying air 4) calculate the new emission factor by using the design airflow and the molar volume of an ideal gas at the sump temperature 5) maintain records of these calculations on site.	Title I Condition: to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 5
Corrective Action: if the 5-day rolling average sump temperature exceeds the maximum permitted value, take corrective action according to the O&M Plan, to reduce the temperature to at least the permitted maximum value. Record all corrective actions taken when completed.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subps. 5 and 14
Monitoring and Recordkeeping: when each sump solution is made, calculate and record the MEA and HCl concentration in units of mole fraction and percent by weight, respectively.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4; Minn. R. 7007.0800, subp. 5
Monitoring: the Permittee shall install the necessary monitoring equipment for measuring and recording the temperature as required by this permit, if not already present. The monitoring equipment must be installed, in use, and properly maintained when the cleanlines are in operation.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4
Monitoring: once each day, observe and record the temperature in the sump, during operation of GP 003 emission unit(s), and calculate and record the 5-day rolling average temperature, as described in Appendix A of this permit.	Title I Condition: monitoring to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4
Recordkeeping: the Permittee shall maintain a hard copy on site of the daily and 5-day rolling average temperatures.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: GP 005 Combustion Equipment

Associated Items:

- EU 029 O.B. Gas Heater (10 B.)
- EU 030 O.B. Gas Heater (20 B.)
- EU 031 Shipping Receiving Heater
- EU 032 O.B. Hot Water Boiler
- EU 033 4-Bay Warehouse Heater
- EU 034 4-Bay Hot Water Boiler
- EU 035 4-Bay Steam Boiler
- EU 036 4-Bay HVAC-3
- EU 037 4-Bay HVAC-8
- EU 038 Equipcenter Gas Generator
- EU 039 Equipcenter Water Boiler
- EU 040 Equipcenter Water Heater
- EU 041 Equipcenter Shipping, Rec. Heaters
- EU 042 Cooling Tower Heater (Changed to electric 7-95.)
- EU 043 Baby Rupp (MA-11)(Vented inside building)
- EU 044 Sludge Drier
- EU 045 MA-6
- EU 046 MA-9
- EU 047 HVAC-1
- EU 048 MA-3 (Vented inside building)
- EU 049 HVAC-7
- EU 050 HVAC-4
- EU 051 HVAC-5
- EU 052 HVAC-6
- EU 053 MA-10 (Vented inside building)
- EU 054 MA-12
- EU 055 Back-up Generator
- EU 056 Penthouse (MA-4)(Vented inside building)
- EU 057 Penthouse Steam Boiler #3
- EU 058 Penthouse Steam Boiler #4
- EU 059 Shredder Room Heater
- EU 060 Shipping, Receiving Heaters
- EU 061 Water Boiler WB-01
- EU 062 Water Boiler (L48)
- EU 063 Water Boiler (Aldrich)
- EU 064 Mezzanine Steam Boiler (SB-01)
- EU 065 Mezzanine Water Boiler
- EU 066 Mezzanine Water Heater
- EU 067 '93 Shipping, Rec. Heaters
- EU 068 '93 Cart Hotel Heater
- EU 069 '93 Water Boiler (HWB-1)
- EU 070 '93 Water Boiler (HWB-2)
- EU 071 '93 Steam Boiler (SB-1)
- EU 072 '93 Water Heater (WH-1)
- EU 141 Hot Water Boiler (B-1)

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Associated Items: EU 142 Hot Water Boiler (B-2)
 EU 143 Steam Boiler (B-3)
 EU 144 Steam Boiler (B-4)
 EU 145 Natural Gas Generator

What to do	Why to do it
GP 005 emission units are limited to combustion units. Fuel usage is limited to distillate fuel oil, natural gas, LPG, and gasoline.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21; Minn. R. 7007.0800, subp. 2
Indirect Heating Equipment Rated Heat Input: the rated heat input of all indirect heating equipment at the facility in total shall be less than 250 million Btu/hr.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21; Minn. R. 7007.0800, subp. 2Minn. R. 7007.0800, subp. 2
Recordkeeping: the Permittee shall monitor and record the amount of each type of fuel used at the facility by maintaining monthly fuel usage records on site. By the 15th day of each month, calculate and record: 1) GP 005 usage of each fuel type during the previous month; 2) GP 005 emissions of SO ₂ , NO _x , and CO as specified in Appendix A of this permit.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21; Minn. R. 7007.0800, subp. 5
Recordkeeping: the Permittee shall include a calculation of the rated heat input of all indirect heating equipment at the facility with the annual submittal of the Equipment Inventory List.	Minn. R. 7007.0800, subp. 5
EXISTING INDIRECT HEATING EQUIPMENT "existing indirect heating equipment" means indirect heating equipment on which construction, modification, or reconstruction did not commence after January 31, 1977.	hdr
Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input	Minn. R. 7011.0510, subp. 1
Opacity: less than or equal to 20 percent opacity , except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0510, subp. 2
NEW INDIRECT HEATING EQUIPMENT "new indirect heating equipment" means indirect heating equipment on which construction, modification, or reconstruction commenced after January 31, 1977.	hdr
Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input	Minn. R. 7011.0515, subp. 1
Opacity: less than or equal to 20 percent opacity , except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0515, subp. 2
STANDARDS OF PERFORMANCE FOR FOSSIL-FUEL-BURNING DIRECT HEATING EQUIPMENT.	hdr
Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot unless required to further reduce emissions to meet the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0610, subp. 1(A)(1)
Opacity: less than or equal to 20 percent opacity , except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0610, subp. 1(A)(2)
STANDARDS OF PERFORMANCE FOR STATIONARY INTERNAL COMBUSTION ENGINES	hdr
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: GP 006 Plasma Etchers

Associated Items: EU 089 Plasma Etcher 1
 EU 090 Plasma Etcher 2
 EU 100 Plasma Etcher 12
 EU 101 Plasma Etcher 13
 EU 102 Plasma Etcher 14
 EU 103 Plasma Etcher 15
 EU 104 Plasma Etcher 16
 EU 105 Plasma Etcher 17
 EU 106 Plasma Etcher 18
 EU 107 Plasma Etcher 19
 EU 108 Plasma Etcher 20
 EU 109 Plasma Etcher 21
 EU 110 Plasma Etcher 22
 EU 111 Plasma Etcher 23
 EU 112 Plasma Etcher 24
 EU 113 Plasma Etcher 25
 EU 114 Plasma Etcher 26
 EU 115 Plasma Etcher 27
 EU 130 Plasma Etcher 28
 EU 131 Plasma Etcher 29
 EU 132 Plasma Etcher 30
 EU 133 Plasma Etcher 31
 EU 134 Plasma Etcher 32
 EU 135 Plasma Etcher 33
 EU 136 Plasma Etcher 34 - clean
 EU 137 Plasma Etcher 35
 EU 138 Plasma Etcher 36 - clean
 EU 139 Plasma Etcher 37 - clean
 EU 140 R&D Plasma Etcher
 EU 153 Plasma Etcher 38
 EU 154 Plasma Etcher 39
 EU 155 Plasma Etcher 40
 EU 156 Plasma Etcher 41
 EU 157 Plasma Etcher 42
 EU 158 Plasma Etcher 43
 EU 159 Plasma Etcher 44
 EU 160 Plasma Etcher 45
 EU 161 Plasma Etcher 46

What to do	Why to do it
GP 006 emission units are limited to plasma etchers that emit HF, NOx, and CO.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Recordkeeping: once each day, record the hours each plasma etcher was operated during the previous day. By the 15th day of each month calculate and record: 1) GP 006 operating hours for the previous month; 2) GP 006 HF, NOx, and CO emissions for the previous month using operating hours calculated in item one, and GP 006 emission factors.	Title I Condition: recordkeeping to avoid classification as a major source under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
The NOx emission factor for the plasma etchers is 0.18 lb/plasma etcher-hr. The CO emission factor for the plasma etchers is 0.32 lb/plasma etcher-hr. The HF emission factor for the plasma etchers is 1.46 lb/plasma etcher-hr.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: GP 007 Miscellaneous Equipment**Associated Items:** EU 027 Flammable Solvent Precision Parts Cleaner

What to do	Why to do it
GP 007 emission units are emission units not included in Groups 001-006 and use VOC- and/or HAP-containing materials.	Title I Condition: emission unit restriction to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Daily Recordkeeping: Record separately for each emission unit in GP 007, the volume of each VOC- and HAP-containing material when the material is taken from the inventory on hand stock. On the day of waste shipment, record the volume of the shipment. By the 15th day of the month calculate and record the mass of VOC and each HAP in the waste shipments for the previous month. Note: In order to calculate the mass of VOC and HAP in waste shipped off-site, the VOC and HAP content of the waste material must be equivalent to the VOC and HAP content in the virgin material (wastes with different VOC and HAP content can not be mixed together).	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
(continued) If different wastes were mixed, the Permittee must sample each drum and analyze the waste to determine VOC and HAP content (according to EPA or ASTM methods), in order to receive credit for the mass of VOC and HAP in recycled/recovered waste, or, the Permittee must use the lowest MSDS values of VOC and HAP of the materials that comprise mixed wastes.	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5
Monthly Recordkeeping: by the 15th day of each month calculate and record the following data for GP 007: 1) the total quantity of each type of VOC- and HAP-containing material used during the previous month; 2) the emissions during the previous month of VOC and HAP listed on the MSDS, based on the quantity of each type of VOC- and HAP-containing material used during the previous month, and the maximum percentage of each VOC and HAP component (stated on the relevant MSDS); 3) the mass of VOC and each HAP in waste shipped during the previous month; 4) GP 007 VOC and individual HAP emissions during the previous month based on the emissions (determined in item two), minus waste shipped (determined in item three).	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: CE 001 Direct Flame Afterburner w/Heat Exchanger**Associated Items:** EU 003 Roller Coater 1

EU 088 Roller Coater 2

What to do	Why to do it
OPERATIONAL REQUIREMENTS	hdr
Control Efficiency: For emission calculations the Permittee can use the following values, or the values from the most recent performance test: 84% for the boiler based on a capture efficiency of 89% and a destruction efficiency of 95% for VOC.	Title I Condition: control efficiency requirement to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Operational Requirement: Route all captured emissions from the roller coaters to the thermal oxidizer at all times except for breakdowns or malfunction or when the roller coaters are being cleaned. Time periods when emissions are not routed to the thermal oxidizer shall be treated as uncontrolled in the emission calculations for the facility.	Title I Condition: operating requirement to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Recordkeeping - Control Equipment Bypasses: Record the date and start and stop times of each thermal oxidizer bypass period. Record the volume of coating material used during the bypass period. Report all bypasses in the facility's semiannual deviation report, and as required by Minn. R. 7019.1000. Apply a capture efficiency of 0% during a bypass period when conducting monthly emissions calculations.	Title I Condition: recordkeeping to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5; Minn. R. 7007.0800, subp. 6
Temperature: greater than or equal to 1300 degrees F using 3-hour Rolling Average while the roller coaters are operated. This minimum temperature may change if a new minimum is set pursuant to Minn. R. 7017.2025, subp. 3, based on the average temperature recorded during the most recent performance test where compliance for VOC emissions was demonstrated.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 14
Corrective Action: if the 3-hour rolling average temperature falls below the required minimum value, take corrective action according to the O&M Plan, to restore the temperature to at least the required minimum value as soon as possible. Record all corrective actions taken when completed. If the temperature falls below the required minimum value, all emissions during this time shall be considered uncontrolled and a control efficiency of 0% shall be used in the monthly emissions calculations.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subps. 5 and 14
TESTING	hdr
Initial Performance Test: due 365 days after Permit Issuance to determine the VOC capture and destruction efficiencies of the thermal oxidizer control system for use in calculating emissions as described above. Subsequent tests shall be before the end of each 24 months after the Initial Performance Test.	Title I Condition: testing to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7017.2020, subp. 1
Performance Test: due 90 days before Startup of material used in the roller coaters that contains any HAP for which a destruction efficiency test hasn't been conducted under Minn. R. 7017.2020-7017.2060. Until a performance test is conducted, a control efficiency can not be used for the new HAP when calculating monthly emissions.	Title I Condition: testing to avoid major source status under 40 CFR Section 63.2; Minn. R. 7017.2020, subp. 1
Performance Test Pre-test Meeting: due 7 days before Performance Test and all tests required to establish a HAP destruction efficiency.	Minn. R. 7017.2030, subp.4
TEMPERATURE MONITORING	hdr
Monitoring: the Permittee shall install the necessary monitoring equipment for measuring and recording the temperature at the combustion chamber outlet. The monitoring equipment must be installed, operated, and properly maintained when the roller coaters are in operation. The temperature monitoring device must be accurate to within +/- 10 degrees Fahrenheit, and the recordkeeping system must be capable of tracking and recording a 3-hour rolling average or a raw temperature in a retrievable and readable manner for a period of 5 years.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4
Recordkeeping: the Permittee shall maintain either a continuous hard copy readout of the inlet temperature, electronic copy, or maintain a hard copy of manual readings taken at least once every 15 minutes. The Permittee shall also calculate and record 3-hour rolling averages of these readings, as described in Appendix A of this permit.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 5

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: CE 002 Packed-Gas Adsorption Column

Associated Items: EU 089 Plasma Etcher 1
EU 090 Plasma Etcher 2
EU 100 Plasma Etcher 12
EU 101 Plasma Etcher 13
EU 102 Plasma Etcher 14
EU 103 Plasma Etcher 15
EU 104 Plasma Etcher 16
EU 105 Plasma Etcher 17
EU 106 Plasma Etcher 18
EU 107 Plasma Etcher 19
EU 108 Plasma Etcher 20
EU 109 Plasma Etcher 21
EU 110 Plasma Etcher 22
EU 111 Plasma Etcher 23
EU 112 Plasma Etcher 24
EU 113 Plasma Etcher 25
EU 114 Plasma Etcher 26
EU 115 Plasma Etcher 27
EU 130 Plasma Etcher 28
EU 131 Plasma Etcher 29
EU 132 Plasma Etcher 30
EU 133 Plasma Etcher 31
EU 134 Plasma Etcher 32
EU 135 Plasma Etcher 33
EU 136 Plasma Etcher 34 - clean
EU 137 Plasma Etcher 35
EU 138 Plasma Etcher 36 - clean
EU 139 Plasma Etcher 37 - clean
EU 153 Plasma Etcher 38
EU 154 Plasma Etcher 39
EU 155 Plasma Etcher 40
EU 156 Plasma Etcher 41
EU 157 Plasma Etcher 42
EU 158 Plasma Etcher 43
EU 159 Plasma Etcher 44
EU 160 Plasma Etcher 45
EU 161 Plasma Etcher 46

What to do	Why to do it
OPERATIONAL REQUIREMENTS	hdr
Control Efficiency: For emission calculations the Permittee can use a control efficiency of 99% for HF, or the value from the most recent performance test.	Title I Condition: control efficiency requirement to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Operational Requirement: Route all emissions from the plasma etchers to the scrubber at all times except for breakdowns or malfunctions.	Title I Condition: control equipment requirement to avoid major source status under 40 CFR Section 63.2

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Recordkeeping - Control Equipment Bypasses: Record the date and start and stop time of each scrubber bypass period. Report all scrubber bypasses in the facility's semiannual deviation report, and as required by Minn. R. 7019.1000. Apply a control efficiency of 0% during a bypass period when conducting monthly emissions calculations.	Minn. R. 7007.0800, subp. 5; Minn. R. 7007.0800, subp. 6
Scrubbing Liquid pH: greater than or equal to 9 pH units after treatment by the caustic portion of the scrubbing system.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4
Recirculated Liquid Flow Rate: greater than or equal to 4 gallons/minute	Title I Condition: monitoring to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4
Upstream Water Spray Valves: inspect these valves once per calendar quarter to ensure they are in the open position. Make a record of each inspection.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4
Monitoring and Recordkeeping: the Permittee shall obtain and record the liquid flow rate and scrubbing liquid pH once each day during operation.	Title I Condition: monitoring and recordkeeping to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4; Minn. R. 7007.0800, subp. 5
Corrective Action: if any of the parameters monitored on the scrubber falls outside the range, take the appropriate corrective action as stated in the O&M Plan. Record all corrective actions taken when completed. If any of the scrubber parameters fall outside their required ranges, all emissions during this time shall be considered uncontrolled and a control efficiency of 0% shall be used in the monthly emissions calculations.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subps. 5 and 14
TESTING	hdr
Performance Test: due before end of each 48 months following Permit Issuance to determine the HF emission factor, per plasma etcher, after control, for use in calculating emissions as described above.	Title I Condition: testing to avoid major source status under 40 CFR Section 63.2; Minn. R. 7017.2020, subp. 1
Performance Test Pre-test Meeting: due 7 days before Performance Test	Minn. R. 7017.2030, subp.4
MONITORING	hdr
Monitoring: the Permittee shall install the necessary monitoring equipment for measuring the pressure drop across the scrubber and the liquid flow rate. The monitoring equipment must be installed, operated, and properly maintained when the plasma etchers are in operation. Records must be kept for a period of 5 years.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4
The monitoring equipment must be installed, in use, and properly maintained when the plasma etchers are in operation. Calibrate the monitoring equipment annually.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

Subject Item: CE 003 Direct Flame Afterburner w/Heat Exchanger**Associated Items:** EU 001 Dipper 1

EU 002 Dipper 2

What to do	Why to do it
OPERATIONAL REQUIREMENTS	hdr
Control Efficiency: For emission calculations the Permittee can use the following value, or the values from the most recent performance test: 42% for VOC.	Title I Condition: control efficiency requirement to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Recordkeeping - Control Equipment Bypasses: Record the date and start and stop times of any period where the entire boiler control system was bypassed (e.g. through the normally locked out bypass stack, not through the normally used bypass stack whereby part of the gas flow not demanded by the boiler is routed to the atmosphere). Record the volume of coating material used during the bypass period. Report all bypasses in the facility's semiannual deviation report, and as required by Minn. R. 7019.1000. Apply a capture efficiency of 0% during a bypass period when conducting monthly emissions calculations.	Title I Condition: control efficiency requirement to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 2
Boiler Firing Rate: greater than or equal to low fire while the dip coaters are being vented to the boiler.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 14
Corrective Action: if the boiler firing rate setting falls below the required minimum value, take corrective action according to the O&M Plan as soon as possible, to restore the boiler firing rate to at least the required minimum value. Record all corrective actions taken when completed. If the boiler firing rate falls below the required minimum value all emissions during this time shall be considered uncontrolled and a control efficiency of 0% shall be used in the monthly emissions calculations.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subps. 5 and 14
TESTING	hdr
Performance Test: due before end of each 24 months following Permit Issuance to determine the VOC control (i.e. capture and destruction) efficiencies of the boiler system for use in calculating emissions as described above. All tests shall be done under low boiler load conditions.	Title I Condition: testing to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7017.2020, subp. 1
Performance Test: due 90 days before Startup of material used in the roller coaters that contains any HAP for which a destruction efficiency test hasn't been conducted under Minn. R. 7017.2020-7017.2060. Until a performance test is conducted, a control efficiency can not be used for the new HAP when calculating monthly emissions.	Title I Condition: testing to avoid major source status under 40 CFR Section 63.2; Minn. R. 7017.2020, subp. 1
Performance Test Pre-test Meeting: due 7 days before Performance Test and all tests required to establish a HAP destruction efficiency.	Minn. R. 7017.2030, subp.4
TEMPERATURE MONITORING	hdr
Monitoring: the Permittee shall install the necessary monitoring equipment for measuring and recording the firing rate of the boiler. The monitoring equipment must be installed, operated, and properly maintained when the dip coaters are vented to the boiler. The recordkeeping system must be capable of tracking and recording a continuous reading of the boiler firing rate in a retrievable and readable manner for a period of 5 years.	Title I Condition: monitoring to avoid major source status under 40 CFR Section 52.21 and 63.2; Minn. R. 7007.0800, subp. 4
Performance Test: due 90 days before Startup of material used in the roller coaters that contains any HAP for which a destruction efficiency test hasn't been conducted under Minn. R. 7017.2020-7017.2060. Until a performance test is conducted, a control efficiency can not be used for the new HAP when calculating monthly emissions.	Title I Condition: testing to avoid major source status under 40 CFR Section 63.2; Minn. R. 7017.2020, subp. 1

TABLE B: SUBMITTALS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson
Permit Number: 08500032 - 001

Table B lists most of the submittals required by this permit. Please note that some submittal requirements may appear in Table A or, if applicable, within a compliance schedule located in Table C. Table B is divided into two sections in order to separately list one-time only and recurrent submittal requirements.

Each submittal must be postmarked or received by the date specified in the applicable Table. Those submittals required by parts 7007.0100 to 7007.1850 must be certified by a responsible official, defined in Minn. R. 7007.0100, subp. 21. Other submittals shall be certified as appropriate if certification is required by an applicable rule or permit condition.

Send any application for a permit or permit amendment to:

Permit Technical Advisor
Permit Section
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Also, where required by an applicable rule or permit condition, send to the Permit Technical Advisor notices of:

- accumulated insignificant activities,
- installation of control equipment,
- replacement of an emissions unit, and
- changes that contravene a permit term.

Unless another person is identified in the applicable Table, send all other submittals to:

Supervisor
Compliance Determination Unit
Air Quality Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Send submittals that are required to be submitted to the U.S. EPA regional office to:

Mr. George Czerniak
Air and Radiation Branch
EPA Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Send submittals that are required by the Acid Rain Program to:

U.S. Environmental Protection Agency
Clean Air Markets Division
1200 Pennsylvania Avenue NW (6204N)
Washington, D.C. 20460

TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility
Performance Test Notification (written)	due 30 days before Performance Test	CE002
Performance Test Notification (written)	due 30 days before Performance Test and all tests required to establish a HAP destruction efficiency.	CE001, CE003
Performance Test Plan	due 30 days before Performance Test	CE002
Performance Test Plan	due 30 days before Performance Test and all tests required to establish a HAP destruction efficiency.	CE001, CE003
Performance Test Report - Microfiche Copy	due 105 days after Performance Test	CE002
Performance Test Report - Microfiche Copy	due 105 days after Performance Test and all tests required to establish a HAP destruction efficiency.	CE001, CE003
Performance Test Report	due 45 days after Performance Test	CE002
Performance Test Report	due 45 days after Performance Test and all tests required to establish a HAP destruction efficiency.	CE001
Performance Test Report	due 45 days after Performance Test and all tests required to establish a HAP destruction efficiency.	CE003

TABLE B: RECURRENT SUBMITTALS

03/04/02

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032 - 001

What to send	When to send	Portion of Facility Affected
Semiannual Deviations Report	due 30 days after end of each calendar half-year following Permit Issuance . The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31.	Total Facility
Compliance Certification	due 30 days after end of each calendar year following Permit Issuance (for the previous calendar year). To be submitted on a form approved by the Commissioner. The report covers all deviations experienced during the calendar year.	Total Facility
Emissions Inventory Report	due 91 days after end of each calendar year following Permit Issuance (April 1). To be submitted on a form approved by the Commissioner.	Total Facility

APPENDIX MATERIAL

Facility Name: Hutchinson Technology Inc - Hutchinson

Permit Number: 08500032-001

Appendix A - Methodology For Calculating Emissions

A. Calculating emissions on a 12-month Rolling Sum basis:

To calculate the emissions for Groups 001 and 007 on a **12-month** Rolling Sum basis, each month the Permittee shall sum the monthly emissions from the previous 12-month period. For the first 11 months of operation, monthly emission data for the months prior to permit issuance shall be determined using the Permittee's actual operating history.

Monthly emissions are calculated as specified in the equations below.

To assist in the calculation of the 12-month rolling sums, the following clarifications are added below. The Permittee shall review any new material used on site for new HAP and/or VOC.

The following pollutants emitted from the facility are classified as both HAP and VOC: glycol ethers, toluene, xylene, and cresol.

The following pollutants emitted from the facility are only classified as VOC: monoethanolamine (MEA), isopropyl alcohol (IPA), cyclohexane, propylene glycol monomethyl ether acetate (PGMEA), naphtha, and ethanol.

The following pollutants emitted from the facility are only classified as HAP: HCl, HF, CN, Pb, and chlorine (gas).

NOTE: to make these determinations for new materials consult 40 CFR Section 51.100(s) and Section 112(b) of the Clean Air Act

A.1. Methodology For Calculating Monthly VOC and HAP Emissions Based On Emission Factors - Groups 002-003, and 006

Groups that have emission factors contained in the permit shall calculate emissions based on multiplying the emission factor by the cumulative hours the specific type of emission units were operated for the month. Specifically,

Equation 1:

$$\text{VOC/HAP} = \text{EF}_i \times h_i$$

where:

VOC/HAP = emissions, lb/mo

EF_i = the emission unit specific emission factor for one compound i, lb/emission unit-hr

h_i = the total number of hours the specific type of emission unit was operated for the month

A.2. Methodology For Calculating Monthly VOC and HAP Emissions Based On Material Usage - Groups 001 and 007

Equation 2.a. for emission units qualifying for 100 % capture efficiency:

$$\text{VOC/HAP} = (\sum A_i V_i) \times (1 - \text{control eff}) \times 0.0005$$

Equation 2.b. for emission units qualifying for less than 100 % capture efficiency:

$$\text{VOC/HAP} = [(\sum A_i V_i) \times \text{capture eff} \times (1 - \text{control eff}) \times 0.0005] + [(\sum A_i V_i) \times (1 - \text{capture eff}) \times 0.0005]$$

where:

i = denotes each separate VOC/HAP containing material used

A_i = amount of VOC/HAP containing material used, lb/month

V_i = fraction of VOC/HAP in A_i as applied, by weight

capture eff = capture efficiency of the VOC/HAP control equipment

control eff = control efficiency of the VOC/HAP control equipment

0.0005 = conversion factor, pounds to tons

Determination of the Use of VOC containing material (A_i)

A_i may be determined by either:

1) direct measurement

2) mass balance calculation*

*The mass balance calculation can account for recovered/recycled VOC containing material as long as records are kept of the weights of the recovered material on a monthly basis.

A.3. Methodology For Calculating Monthly Combustion Source Emissions (Indirect heating sources and Internal Combustion Engines) based on emission factors - Group 005

SO₂, NO_x, and CO are calculated using Equation 3:

Equation 3:

$$\begin{aligned} \text{Pollutant} = & 0.0005 \times [(EF \times Q)_{ng} + (EF \times Q)_{lpgb} + (EF \times Q)_{lpgp} + (EF \times Q)_{do}]_{ihs} \\ & + 0.0005 \times [(EF \times Q)_{ng} + (EF \times Q)_{lpgb} + (EF \times Q)_{lpgp} + (EF \times Q)_{do}]_{dhs} \\ & + 0.0005 \times [(EF \times Q)_{ng} + (EF \times Q)_{do} + (EF \times Q)_g]_{rice} = \text{tons/month} \end{aligned}$$

where:

EF = emission factor (see Table 1 and 2)

Q = actual quantity of fuel burned per month (group the units that are appropriate to the emission factor for each fuel type.)

ng = natural gas

lpgb = liquefied petroleum gas (butane)

lpgp = liquefied petroleum gas (propane)

do = distillate oil

g = gasoline

ihs = indirect heating source

dhs = direct heating emission source

rice = reciprocating internal combustion engines

0.0005 = conversion factor, pounds to tons

Table 1

Industrial Indirect and Direct Heating Sources				
Emission Factors				
Pollutant	Natural Gas lb/million ft³	LPG - Butane lb/1000 gal	LPG - Propane lb/1000 gal	Distillate Oil lb/1000 gal
SO _x	0.6	0.09S	0.10S	144S
NO _x	100	21	19	25
CO	84	3.6	3.2	5

Table 2

Industrial Reciprocating Internal Combustion Engines			
Emission Factors			
Pollutant	Natural Gas lb/million ft³	Distillate Oil (Diesel) lb/1000 gallons	Gasoline lb/1000 gallons
SO _x	0.6	31.2	5.31
NO _x	3400.0	469.0	102.0
CO	430.0	102.0	3940.0

Where:

SO₂ = Sulfur Dioxide
NO_x = Oxides of Nitrogen
CO = Carbon Monoxide
MM = Million
Btu = British thermal unit
lbs = pounds
ft³ = cubic feet
gal = gallons
S = % sulfur in the fuel

Note: any subsequent revisions of the emission factors in sections 1.3, 1.4, 3.3, 3.4 of AP-42 supercede the numbers in Tables 1 and 2.

B. Calculating GP 001 temperature on a 3-hour Rolling Average basis:

To calculate temperature on a **3-hour** Rolling Average basis, once each hour the Permittee shall sum and average all temperature data points for the previous operating hour, and then sum and average the hourly temperature values from the previous 3 operating hours.

C. Calculating GP 002, GP 003, and GP 004 temperature on a 5-day Rolling Average basis:

To calculate temperature on a **5-day** Rolling Average basis, once each day the Permittee shall sum and average the daily temperature values from the previous 5 operating days.

TECHNICAL SUPPORT DOCUMENT
For
AIR EMISSION PERMIT NO. 08500032-002

This technical support document is for all the interested parties of the permit. The purpose of this document is to set forth the legal and factual basis for the permit conditions, including references to the applicable statutory or regulatory provisions. One comment letter was received during the public notice period (See Attachment 10). No comments were received from EPA during their 45-day review period.

1. General Information

1.1. Applicant and Stationary Source Location:

Facility Contact and Phone Number	Facility Address (SIC Code: 3577)
Hutchinson Technology, Inc. - Hutchinson Mr. Eric Yost Environmental Engineer (320) 587-1541	Hutchinson Technology, Inc. - Hutchinson 40 West Highland Park Hutchinson, Minnesota 55350 McLeod County

1.2. Description of the facility

Hutchinson Technology, Inc. (HTI) is a manufacturer of suspension assemblies for all sizes of computer disk drives. The suspension assembly holds the read/write head at extremely small distances above the spinning disks. HTI currently holds about 50% of the world market, with its only competitors being in Asia. Two types of suspension assemblies are made, conventional and TSA (suspensions incorporating integrated electrical leads). The TSA product will eventually become the core product manufactured by the company.

The high tech market HTI is in can prove to be very volatile. Sales of all types of suspension assemblies from HTI have increased at rates greater than 25% per year over the last five years. Most products in this industry usually only have lifetimes of about 3 years. Because of this volatility, HTI needs to have a permit that is as flexible as possible so that it can respond quickly to changing market demands.

The facility operates two 12-hour shifts for approximately 362 days per year. The Hutchinson facility has been in operation since 1972 and has about 1800 employees.

The following operations generate air emissions at this facility:

- Components (Etching)
- Plating
- Tool Room
- Facilities

Permit Number: 08500032-001

Date: 3/04/02

Attachment 1 shows the general process flows and air emissions from the facility.

The components operation takes raw stainless steel or stainless/copper clad material and through a photoetching process produces individual parts. The stainless steel used at the facility arrives on rolls. The material is sheared into workable pieces and then cleaned and dried. The next step is the photoetching process. This process uses light sensitive coatings that are applied to the steel parts via solutions and then subjected to ultraviolet (UV) light to impart a pattern onto the parts. The pattern is later permanently set in the part with an etching solution. Remaining photoetching solution (photoresist) is removed during the stripping step. Many different solutions are used during the numerous steps involved in the production and cleaning of the parts. Some of the solutions used are acidic or alkaline, while other solutions contain volatile organic compounds (VOC) and hazardous air pollutants (HAP).

Parts that will become TSA (termed Trace) assemblies have two unique steps, plasma etching and gold plating (see page 2 of Attachment 1). The plasma etching process generates the following regulated pollutants: hydrogen fluoride (HF), carbon monoxide (CO), nitrogen oxides (NO_x), and very small amounts of lead emissions as by-products of the process. The plating process generates cyanide (CN) and lead (Pb) emissions.

The final operation in the overall manufacturing of the parts is assembly. Individual processes within this operation include forming, welding, cleaning/heat treat, and packaging. The assembly operations do not occur at the Hutchinson facility.

Two support areas at the facility are the tool room and support facilities. The tool room fabricates tools and dies for use in production and uses different metal cleaning systems. The facilities support area includes wastewater pre-treatment, process water treatment, and combustion equipment used for heat, steam, and hot water generation.

The significant emission sources at the facility are all evaporative and include: the photoetching solutions, and the many different cleaning solvents used throughout all areas of the plant. About 75% of the actual VOC emissions at the facility are emitted during the application of the photoresist solution by either the two roller coaters or the two dip coaters. The roller coaters are vented through a hood to a thermal oxidizer while the dip coaters are vented to a process boiler.

Other emission units at the facility are controlled as well. The air from the plasma etching solutions is vented to a scrubber to remove HF. Other evaporative sources such as the cleanlines and strippers have spray nozzles in the exhaust vents that spray water countercurrent to the exhaust gas flow. Testing has not been done to determine the control efficiencies of the spray nozzles, so the control efficiency is not claimed by the facility. The HF scrubber, the thermal oxidizer and boiler control efficiency have all been tested and their control efficiencies have been claimed in the permit.

There are other small sources of air emissions at the facility which include chemicals used in waste/process water treatment and 45 pieces of small combustion equipment (each unit is less than 10 MMBtu/hr rated heat input). The combustion units include: generators, forced air heaters, hot water heaters, dryers, and boilers. The total rated heat input for all the units at the facility is 57 MMBtu/hr. All units except for one generator are natural gas fired.

1.3 Description of any changes allowed with this permit issuance

The Permittee has submitted two amendment applications (see section 1.4). These amendments will be included in this permit action.

1.4 Description of all permit applications which are to be included in the Part 70 Permit.

The facility currently does not have an air permit. It applied for one in 1987, but was told by the MPCA in 1988 that one was not required. In 1993 the MPCA determined that a permit was required, and an application was filed by HTI on March 31, 1993.

Permit Application Date	Description
Received May 15, 1995	Total facility permit application
Received July 25, 1996	Revised total facility permit application
Received November 10, 1997	Permit amendment application for the addition of: 1) a second roller coater and a thermal oxidizer to control VOC from both roller coaters, 2) 27 plasma etchers and a scrubber to control HF emissions from them.
Received February 9, 1998	Permit amendment application for the addition of boilers and an emergency generator to a new R & D building.

1.5. Facility Emissions:

Table 1. Total Facility Uncontrolled Potential to Emit Summary:

EU #	GP#	Emission Unit Description	PM tpy	PM ₁₀ Tpy	SO ₂ tpy	NO _x tpy	CO tpy	VOC tpy	Pb Tpy	Single HAP tpy	All HAP tpy
	001	Photoresist Coaters						105		6.5	14.3
	002	Conventional						16.9*		0.09	0.09
	003	Trace Strippers						*		0	0
	005	Combustion Equip.	4.0	4.0	2.2	37.4	7.9	1.5	0	<1.5	<1.5
	006	Plasma Etchers				15.6	52.0			5.6	5.6
	007	Misc. Equip.						4.4			
	**	Current Insig. Activs.						24.8		3.9	3.9
	**	Future Insig.		15	40	40	100	40	0	0	0

* total VOC for GP002 and 003

**Current Insignificant Activities are emission units existing at the facility at the time of permit issuance. Their PTE was accounted for in the calculation of the flexcaps for the facility. Future Insignificant Activities allow for the addition of emission units after permit issuance that qualify as insignificant activities.

	PM tpy	PM ₁₀ tpy	SO ₂ tpy	NO _x tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAP tpy
Total Facility Potential Emissions*	249*	249*	249*	249*	249*	249*		9*	24*

* Total Facility Emissions are limited by the flexcaps on total facility

Table 2. Total Facility Controlled Actual Emission Summary (1999):

EU #	GP#	Emission Unit Description	PM tpy	PM ₁₀ tpy	SO ₂ tpy	NO _x tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAP tpy
	001	Photoresist Coaters						16		1.1	2.6
	002	Conventional						1.3		0.02	0.02
	003	Trace Strippers						6.5		0	0
	005	Combustion Equip.	0.6	0.6	0.3	5.4	1.1	0.2	0	<1.5	<1.5
	006	Plasma Etchers				1.4	2.0			0.02	0.02
	007	Misc. Equip.						3.1			
		Current Insig. Activs.*						24.4		2.8	2.8
		Future Insig.		TBD	TBD	TBD	TBD	TBD	0	0	0

* Actual emissions of insignificant activities do not need to be tracked, so potential emissions are included here

Permit Number: 08500032-001

Date: 3/04/02

	PM tpy	PM ₁₀ tpy	SO ₂ tpy	NO _x tpy	CO tpy	VOC tpy	Pb tpy	Single HAP tpy	All HAP tpy
Total Facility Actual Emissions	0.6	0.6	0.3	6.8	3.1	51.5	0	5.4	6.9

Table 2. Facility and Permit Classification

Classification	*Major Source	*Synthetic Minor	*Minor
PSD			X
NAAR (not applicable)			
Part 70 Permit Program	X		

* Refers to potential emissions that are less than those specified as major by 40 CFR 52.21, 40 CFR pt. 51 Appendix S, and 40 CFR pt. 70. The facility is a natural minor source for PSD at this time.

2. Regulatory and/or Statutory Basis

this section not utilized

3. Technical Information

The Permittee is an excellent candidate for a flexible permit due to the characteristics of the market it competes in (as outlined in part 1.2 of this document). Flexible permits, or a FlexCaps, are an advantage for both the Permittee and the agency because specific types of changes are pre-authorized which eliminates the need to prepare and process permit amendments that would otherwise be required.

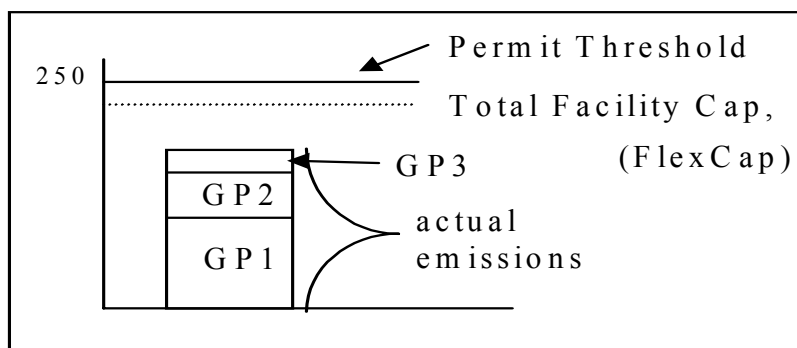
General Approach

FlexCaps are considered when a facility modifies its production lines frequently. MPCA FlexCap guidance and existing flexible permits (manufacturing general permit, 3M Maplewood) were reviewed while drafting this permit. The FlexCap approach should produce a stand-alone permit. FlexCaps can be set for a portion of, or all the pollutants at a facility. FlexCaps can also be configured to include a number of Groups of common emission units at a facility, or the entire source. When caps for individual pollutants are set up for a number of Groups, the total actual emissions of all the Groups, for each pollutant, must be less than the respective applicable Total Facility Cap. The Total Facility Cap can be either the applicable total facility permit threshold or a number that is somewhat below this figure (see Figure 1). Traditional permitting applies to units not included in a Group. At HTI, Groups were set up on the basis of the emission unit's similar function in the process and/or the pollutants emitted and how they are calculated. In this way the emission tracking and compliance demonstration methods within the Groups are similar.

Some emission units at the facility were not included in the Groups. The emission units not included in a Group were generally very small emission sources. The PTE for pollutants from these emission units were subtracted from the corresponding pollutant thresholds to produce slightly lower Total Facility Caps. An advantage of this approach is that the actual emissions do not need to be tracked for these numerous small sources.

Permit Number: 08500032-001

Date: 3/04/02



Example Situation for Criteria Pollutant X

At the time of this permit, the uncontrolled PTE of this facility is below Prevention of Significant Deterioration (PSD) major source thresholds (250 tons per year) for all pollutants. To maintain maximum flexibility, the Permittee has chosen as its limit the PSD major source thresholds, even though it could likely meet Part 70 thresholds (100 tons per year for criteria pollutants). In spite of this large cushion, the Permittee has still gone ahead and installed a number of different pieces of pollution control equipment at the facility. The facility is also a natural minor source for HAP. In all likelihood HTI will be limited in the future by the major source thresholds for HAP, which are 10 tons per year for any single HAP, or 25 tons per year for any combination of HAP before coming close to a criteria pollutant threshold.

Emission Estimation Methods and Compliance Demonstration

Total Facility

The general organization of the requirements in this part of the permit was borrowed from the manufacturing general permit. The overriding requirement is for the Permittee to add the actual emissions, calculated for each Group, together once each month to arrive at the total facility 12-month rolling sum for each pollutant emitted from the facility. In addition the Permittee must maintain an Equipment Inventory List which will be updated as emission units are added to the facility or deleted. The List must be submitted to the agency annually. Only emission units that fit into one of the existing Groups in the permit (based on common emissions and compliance demonstration) can be added to the facility without a review of the traditional permitting requirements (unless they qualify as Insignificant Modifications).

Insignificant Modifications may also be made to the source. The potential emissions from Insignificant Modifications are recorded and tracked by the facility. The cumulative total potential emissions for all Insignificant Modifications are calculated each time that a new Insignificant Modification is made. When the cumulative total for any pollutant is greater than four times the threshold at Minn. R. 7007.1250, subp. 1(B)(2), the facility must apply for a major amendment to adjust the allocation of emissions for all pollutants under their respective Total Facility Caps. After this action the cumulative totals for all pollutants tracked as Insignificant Modifications will be reset to zero. There are no Insignificant Modifications with respect to

HAP. A new emission unit that emits HAP must fit into an existing Group otherwise traditional permitting will apply.

Another requirement is emission unit labeling to aid future inspections.

Group 001 - Photoresist Coaters

The large majority of the VOC emissions at this facility are emitted from this Group. There are two types of coaters in this Group; roller coaters (2) and dip coaters (2). Emissions from the roller coaters are collected through a hood and vented to a thermal oxidizer. The results of emissions testing that was conducted in February, 2000 to determine the collection and overall control efficiency for this system can be found as Attachment 4. The results show the collection efficiency to be 89 percent and the destruction efficiency of the oxidizer to be 95 percent, resulting in an overall control efficiency for this system of 84 percent. The facility is not required to control cleaning emissions during the time the roller coaters are shut down and cleaned. This is about 3 hours per week, or 1.8% of total operating time.

Emissions from the dip coaters are controlled by being vented to a boiler that is used to heat water for processes at the facility. The VOC-laden-air is collected from the dip coaters through what is essentially a total enclosure. Parts are loaded through doors that close and isolate the room. The entire room is under negative pressure and the doors are only open about 30 seconds in a half hour cycle. The boiler uses the VOC-laden air as combustion air. A drawing of the control system can be found as Attachment 5. The quantity of combustion air demanded by the boiler depends on the boiler firing rate, which is dictated by the processes' heating needs. VOC-laden combustion air that is not needed by the boiler is bypassed to the atmosphere. Testing was conducted at three different firing rates (low, medium, high) to determine how the boiler performed across the normal range of firing rates the boiler sees during the year. The results (included in Attachment 4) show the overall control efficiency of the boiler system to be 42 percent, 58 percent, and 87 percent for the low, medium, and high firing rates respectively. While the boiler destruction efficiency was essentially unchanged across three tests at a minimum of 99 percent, the combustion air demanded increased as the firing rate increased thereby increasing the overall destruction efficiency. HTI proposes to use the worst case destruction efficiency of 42 percent in its compliance calculations. To use the higher values would require additional compliance demonstration related to the firing rate of the boiler. HTI has decided not to undertake this approach.

Actual emissions from these emission units are calculated using a mass balance approach, assuming that any photoresist which is not recycled is emitted to the control equipment through its respective collection system. The control efficiency of the control equipment is then considered. A requirement is included in the permit to retest the control equipment to determine its control efficiency based on MPCA policy. Monitoring, recordkeeping and reporting associated with the materials use tracking and control equipment are also included.

Group 002 – Conventional Strippers

There are currently six strippers that are used to make conventional suspension assemblies at the facility: EU016 – Vertical (BlueLine) Stripper #1, EU018 - Vertical Stripper #2, EU019 - Vertical

Permit Number: 08500032-001

Date: 3/04/02

Stripper #3, EU080 - Vertical Stripper #4, EU081 - Vertical Stripper #6, EU084 - Vertical Stripper #9. Two drawings of a typical stripper are included as Attachment 6. Currently only two of the strippers (#1 and #6) use a VOC-based stripping solution which contains MEA (monoethanolamine CAS # 141-43-5 which is classified as a VOC) and Butyl Carbitol (CAS 112-34-5 which is classified as both a VOC and a HAP, since it is also classified as a glycol ether). All strippers use a dilute HCl solution. HTI has been working toward only having one stripper utilizing the VOC-based stripping solution but has run into some operational problems recently.

Glycol ethers and MEA have low vapor pressures so assuming that the amount used is equivalent to the amount emitted to the atmosphere, as was done in Group 001, would be a gross overestimate. As an alternative, emission factors were developed for this glycol ether based on the application of physical chemistry. Starting with a known liquid mole fraction and vapor pressure (determined from standard chemical engineering texts and adjusted to the proper temperature by using one of a number of empirical correlations) the partial pressure was calculated by application of Raoult's Law. The mass flow rate was then determined by multiplication of the vapor pressure and the airflow rate (using the Ideal Gas Law). Multiplication of the emission factor by the total hours the cleanlines operated produces an estimate of actual emissions. Specific changes at the facility could be made which would make the emission factors invalid. These changes are defined in the permit and provisions are set out for the recalculation of the emission factor should any of these changes be made. The monitoring and recordkeeping that supports compliance demonstration for these units are recording the hours the units operated and monitoring the temperature of the liquid in the sump. The liquid is pulled from the sump and sprayed on the parts. The temperature in the sump is higher than the temperature in the application area and exhaust stream so this is a conservative location to monitor the temperature of the system. The sump temperature was also the temperature used in the emission calculations.

Much discussion has taken place regarding the applicability of Raoult's Law to this system to derive emission factors. USEPA suggested that Henry's Law may be more appropriate. At worst the difference in approaches could make an estimated factor of 3.4 increase in VOC emissions and a three order of magnitude difference in glycol ether emissions. The potential VOC increase would still leave room under the VOC flexcap for the facility. The potential glycol ether increase would make the source major for HAP.

HTI believes it has taken the proper approach to conservatively estimate emissions from these sources. In an attempt to support this position, HTI developed a test plan to conduct emissions testing entitled "Stripper Air Emissions Work Plan" (Attachment 7). This document was mailed to USEPA on March 24, 2000 for comment. None was received. This testing described in this document was incorporated into this permit and will be conducted within 180 days after permit issuance. Should the testing show that the emissions factors in the permit (derived from Raoult's Law) are not conservative, a major amendment will be necessary to change the emission factors in the permit within 60 days of the date the test report was submitted to the MPCA.

Group 003 – TSA (trace) Strippers

There are currently three strippers that are used to make trace suspension assemblies at the facility: EU082 – Vertical Stripper #7, EU083 - Vertical Stripper #8, EU119 - Vertical Stripper #5. The emission units in this Group use solutions containing MEA and HCl. The overall approach used is virtually identical to GP 002.

Group 004 - Reserved

Group 005 - Combustion Equipment

As stated in Part 1.2 of this document, there are about 45 pieces of small combustion equipment (each unit is less than 10 MMBtu/hr rated heat input). The units include: generators, forced air heaters, hot water heaters, dryers, and boilers. Most would be considered insignificant activities. The total rated heat input for all the units at the facility is 57 MMBtu/hr. The fuels used in these units are natural gas (and diesel fuel for the diesel emergency generator). Actual emissions from all of these units will be tracked through the use of emission factors and tracking of total facility fuel usage. Due to the limit of 249 tons/year for NO_x and CO, the HAP emitted from fuel combustion is inherently limited to at most 1.5 tons per year for all HAP combined and the VOC emitted from fuel combustion is inherently limited to at most 20 tons per year. Therefore, HAP or VOC actual emissions from fuel combustion units are not tracked for compliance demonstration purposes. The way these pollutants are accounted for is that the HAP and VOC PTE from these units is subtracted from the HAP and VOC Total Facility Permit Thresholds to produce lower HAP Total Facility Caps for those pollutants (see below).

Group 006 - Plasma Etchers

HF emissions from the plasma etchers are a by-product from the chemical reaction of the fluorine atom in the plasma with hydrogen atoms from organic compounds. Organic compounds involved in TSA component parts production are found in the polyimide and photoresist layers of the parts. Other regulated pollutants produced through the process are CO and NO_x. The key parameters that affect the HF emission rate are: 1) amount of available dissociated fluorine atoms, 2) etch selectivity (preferential etching of polyimide vs photoresist), and 3) number of panels (containing TSA parts) in each etcher chamber. Etch selectivity includes a large list of process conditions including such parameters as etching gas amount, etching time, and electrical conditions.

Etching selectivity can affect the amount of photoresist that is etched and thus affect the amount of HF emitted. Since photoresist covers the panels of TSA parts to protect parts from unwanted etching, it is not desirable to etch away any more photoresist than is necessary to complete the etching of the polyimide layer. Typical etching is about 25% of the photoresist layer although some products may end up having more etched due to conditions imposed to produce TSA parts within specifications. For potential to emit estimation purposes, HTI assumes that the worst case scenario for the amount of photoresist etched is 75%. Any more etching of the photoresist layer would produce a product that would not sell and would constitute a complete waste of adding the photoresist layer in the first place.

As far as the number of panels per cycle, all of the etchers can handle 12 or 36 panels per cycle.

Permit Number: 08500032-001

Date: 3/04/02

A drawing of the plasma etcher control system can be found as Attachment 8. Banks of individual plasma etchers are exhausted together to a common header which contain multiple water sprays. The exhaust gas is then vented to packed bed scrubber. The control efficiency of this system was tested in February, 2000. The control efficiency of the scrubber without considering the affect of the upstream water sprays was 94% for HF. The control efficiency of the entire system considering both the scrubber and the upstream water sprays was 99.9%.

Actual emissions from this Group are calculated based on emission factors developed from engineering tests conducted by the Permittee. A requirement is included in the permit to retest the scrubber to determine the controlled HF emission factor per etcher. The control efficiency of the system is not expected to change since HF is highly soluble in water. Monitoring, recordkeeping and reporting associated with the control equipment are also included. HTI will claim the control efficiency of the water sprays that are upstream of the scrubber because it chose to undertake monitoring activities to assure that the sprays are operational. The monitoring involves quarterly inspection and recordkeeping of the valves controlling these sprays. These valves are locked out, so a quarterly inspection requirement was deemed sufficient.

Group 007 - Miscellaneous Equipment

Emission units that are not included in any of the other Groups can be included in this Group provided that they emit only chemicals whose emissions can be tracked based on a mass balance approach. There are allowances in the emission calculation method for recycled materials. The overall approach used is virtually identical to GP 001 except that there is no control equipment to consider.

Units not included in a Group

Emission units that are not included in any of the above Groups are listed below. Their maximum potential emissions are also listed. These emissions are subtracted from their respective pollutant-specific threshold to produce the flexcap for each pollutant at this facility. Since the emissions from these units were calculated using a maximum potential approach, no specific compliance demonstration requirements are included in the permit for them other than the general requirements (i.e. inclusion on the Equipment Inventory List and emissions unit number labeling requirement). Some of these emission units have control equipment associated with them yet the affect of this control equipment is ignored so that the emission estimates produced are the maximum potential.

Summary of Units Not Included in a Group

<i>EU #</i>	<i>Name</i>	<i>Pollutant</i>	<i>PTE (tpy)</i>
005, 006, 079, 085	Cleanlines 6, 4, 5, 3	HCl	<0.01
007-009 011-015 075-078	Etchers (including pre-etch)	HCl Cl ₂	0.67 0.39
GP002 & GP003	Conventional and Trace Strippers	HCl	<0.001
074	2 HCl storage tanks	HCl	0.136
073, 127 128, 129	Gold Plating	CN Pb	<0.001 <0.001
lead plating line ceased operation in 1998, emissions left in permit calculations to allow for restart of line in future if necessary			
149	Reflow Ovens	Pb	<0.001
152	Dry Film Resist	VOC	0.011
151	Coverlay (Wet and Dry Film)	VOC Total HAP	3.19 1.221
023, 025 147, 148	Drum Parts Cleaners	VOC	0.26
150 & 118	B-1 (conventional) and B-8 (trace) Wastewater Systems	Glycol ethers VOC	0.12 1.33
074 TK001, 003	HCl tanks for Water Treatment	HCl	0.08
GP005	Combustion HAP	Total	1.5*
GP005	Combustion VOC	VOC	16.3*

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<i>Total of emission units above</i>	<i>HAP</i>	<i>4.1</i>
	<i>VOC</i>	24.8

Permit Number: 08500032-001

Date: 3/04/02

<i>Allowance for Future Insignificant Activities</i> <i>4 X the threshold at M.R. 7007.1250, subp. 1(B)(2)</i>	<i>PM</i>	<i>15</i>
	<i>PM₁₀</i>	<i>15</i>
	<i>NO_x</i>	<i>40</i>
	<i>SO₂</i>	<i>40</i>
	<i>CO</i>	<i>100</i>
	<i>VOC</i>	<i>40</i>
<i>Total Facility Permit Threshold</i>	<i>Single HAP</i>	<i>10</i>
	<i>Total HAP</i>	<i>25</i>
	<i>Criteria Pollutants</i>	<i>250</i>
<i>Total Facility Cap</i> **	<i>Single HAP</i>	<i>4.9</i>
	<i>Total HAP</i>	<i>19.9</i>
	<i>PM</i>	<i>234</i>
	<i>PM₁₀</i>	<i>234</i>
	<i>NO_x</i>	<i>209</i>
	<i>SO₂</i>	<i>209</i>
	<i>CO</i>	<i>149</i>
	<i>VOC</i>	<i>185</i>

* See discussion in GP 005 of part 3 Specific Emission Estimation and Compliance Demonstration (above)

** All pollutant limits have an additional 1 ton/yr cushion to account for any unforeseen uncertainties in the emission estimation methods.

Summary

A large majority of the emission units whose emissions are being tracked at this facility would normally qualify as insignificant activities under Minn. R. 7007.1300. If the existing insignificant emission units at the facility are not included in a Group their PTE has been subtracted from the Total Facility Permit Thresholds to produce lower Total Facility Caps. Either way ALL emission units at the facility are accounted for in the permit. In addition, a comprehensive set of periodic monitoring requirements are included (e.g. tracking hours of operation, materials use, fuel use, bath makeup concentrations, temperature monitoring, etc.) that yield data that are representative of the source's compliance with this permit. The large cushion between the actual emissions from this facility and the applicable limits, along with the effort taken in this permit to track all sources of emissions (even very small sources) should make concerned parties confident that this permit will be a very strong tool for the facility to demonstrate compliance with air quality rules and regulations.

4. Conclusion

Based on the information provided by the Hutchinson Technologies, Inc., the MPCA has reasonable assurance that the operation of the emission facility, as described in the Air Emission Permit No. 08500032-002 and this technical support document, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Permit Number: 08500032-001

Date: 3/04/02

Staff Members on Permit Team: Trent Wickman, Marshall Cole, Glenn Giefer, Dave Vaaler,
Steve Sommer, Yolanda Hernandez, Stuart Arkley

Attachment: 1) Process Flow and Air Emission Schematic
2) Air Emission Unit – Cross Reference
3) Air Emissions Inventory
4) Test Results for Coating Systems
5) Dip Coater Control System
6) Stripper Drawings (2)
7) Stripper Air Emissions Work Plan
8) MSDS (public copies)
9) CD-01 printout
10) Comments during Public Notice