

APPENDIX B

2006 SEMICONDUCTOR INDUSTRY SURVEY FORM



California Air Resources Board
SEMICONDUCTOR EMISSIONS SURVEY

Is this page confidential?

Click cell and use drop down menu in blue areas.

Type in response in yellow areas.

Responses will be kept confidential to the extent indicated in the paragraph below.* Results will be made available in aggregate form to protect confidentiality.

1 Company/Organization Name:

2 Contact Person:

3 Title:

4 Phone:

5 E-mail:

6 Standard Industrial Classification (SIC) Code:

7 Total number of California employees :

8 What type of semiconductor facility does your company/organization operate?

Manufacturer

R & D

University

Other (please specify):

9 Is the company/organization a member of any industry association?

Semiconductor Industry Association (SIA) member?

Other Association ?

	(If yes, please specify:)	

10 Does the company currently participate in any voluntary agreement (Memorandum of Understanding) with the U.S. Environmental Protection Agency to reduce fluorinated gas emissions?

**In accordance with title 17, California Code of Regulations (CCR), sections 91000 to 91022, and the California Public Records Act (Government Code section 6250 et seq.), the information that a company provides to the Air Resources Board (ARB) may be released: (1) to the public upon request, except trade secrets which are not emissions data or other information which is exempt from disclosure or the disclosure of which is prohibited by law; (2) to the United States Environmental Protection Agency (U.S. EPA), which protects trade secrets as provided in section 114(c) of the Clean Air Act and amendments thereto (42 USC 7401 et seq.) and in federal regulation; and (3) to other public agencies provided that those agencies preserve the protections afforded information which is identified as a trade secret, or otherwise exempt from disclosure by law (section 39660(e)).*

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11 Which of these fluorinated gases do you use?

Hexafluoroethane (C ₂ F ₆)	
Octofluoropropane (C ₃ F ₈)	
Tetrafluoromethane (CF ₄)	
Trifluoromethane (CHF ₃)	
Octofluorocyclobutane (c-C ₄ F ₈)	
Octafluorotetrahydrofuran(C ₄ F ₈ O)	
Hexafluoro-1,3-butadiene (C ₄ F ₆)	
Nitrogen Trifluoride (NF ₃)	
Sulfur Hexafluoride (SF ₆)	
Other (please specify):	

If you are not using any of the chemicals listed in question 11, please skip to page 5; type in your name and the date; save the file to your computer; and send it by e-mail to dtrench@arb.ca.gov.

12

How many kilograms of these gases did you purchase in calendar year 2006? (Specific process information is important to develop an effective regulation. Please provide your best estimate if process specific information is not readily available.)

Original Chemical	Etching	CVD Chamber Cleans	Other (please specify)

C ₂ F ₆			
C ₃ F ₈			

CF₄
 CHF₃
 c-C₄F₈
 C₄F₈O
 C₄F₆
 NF₃
 SF₆

Other: _____
 (please specify)

13 What size(s) of wafers are you currently producing?

150 mm or less
 200 mm
 300 mm

	(mm)

Prototypes (please specify mm)
 Other (please specify):

14 How many wafers were produced from the facility in calendar year 2006, rounded to the nearest hundred?

150 mm or less
 200 mm
 300 mm

Other: _____
 (please specify)

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Is this page
 confidential?

15 Do you have any plans to relocate your California fab to another state or country or close the facility? (This information is important to assess emissions "leakage" and future emissions trends.)

Relocate?

Close?

If yes,
 please
 indicate
 relocation
 year.

If yes,
 please
 indicate
 closure
 month.

If yes,
 please
 indicate
 closure
 year.

If yes, please indicate relocation month.

New Location (please specify)

16 Do you currently use optimization strategies for the processes below to reduce fluorinated gas emissions?

CVD Chamber Cleans

Etch Cleans

Other Process (please

specify)

If you do not use process optimization, please explain why.

17 Do you currently use remote plasma to reduce fluorinated gas emissions?

18 Do you currently use alternative chemistries to reduce fluorinated gas emissions?

If yes, please indicate the change in chemicals and the process affected.

Original Chemical	Changed to?	Process (etching, CVD clean, both, other?)
C ₂ F ₆		
C ₃ F ₈		
CF ₄		
CHF ₃		
c-C ₄ F ₈		
C ₄ F ₈ O		
C ₄ F ₆		
NF ₃		
SF ₆		
Other: _____ (please specify)		

If you do not use alternative chemistries, please explain why.

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19 Do you currently use capture/recovery systems to reduce fluorinated gas emissions?

If yes —

Is it a small system used for single fluorinated gas high-volume

Is it a centralized building-wide system?

process?

[Redacted]

If you do not use capture/recovery, please explain why.

[Redacted]

20

Which of the following abatement technologies, and for what processes, do you use to reduce fluorinated gas emissions?

Technology

Process

CVD
Chamber
Cleans Etch

Point of Use Fuel Burner — Scrubber

[Redacted]

If yes.....

[Redacted]

Point of Use Catalytic — Scrubber

[Redacted]

If yes.....

[Redacted]

Point of Use Electrically Heated — Scrubber

[Redacted]

If yes.....

[Redacted]

Point of Use Atmospheric Plasma

[Redacted]

If yes.....

[Redacted]

Point of Use Pre-pump Plasma

[Redacted]

If yes.....

[Redacted]

Centralized Atmospheric Plasma

[Redacted]

If yes.....

[Redacted]

End of Pipe Abatement System

[Redacted]

If yes.....

[Redacted]

If you do not use abatement equipment, please explain why.

[Redacted]

21 Are there any other fluorinated gas emission reduction strategies you have implemented?

[Redacted]

If yes, please describe the strategy.

To complete the survey, please type in your name, title, and date below; save the file to your computer; then send it by e-mail to dtensch@arb.ca.gov. Please see the survey instructions tab for information on password protecting your survey responses before sending your survey by e-mail.

RETURN your survey by FRIDAY, February 15, 2008 to:

dtensch@arb.ca.gov

If submitting your survey by hardcopy, please send to:

Air Resources Board
Stationary Source Division
Attn: Dale Tenschel
P.O. Box 2815
Sacramento, CA 95812

Questions? Contact Dale Tenschel at 916-324-0208 or e-mail dtensch@arb.ca.gov.

I certify that the information being provided is true, accurate and complete.

Printed Name

Title

Signature (if submitting by hardcopy)

Date