

Environmental Protection Agency

Pt. 98, Subpt. I, Table I-3

conditions of process characterization, etch conditions or actual film deposition including but not limited to actual conditions.

[75 FR 74818, Dec. 1, 2010, as amended at 77 FR 10381, Feb. 22, 2012]

TABLE I-1 TO SUBPART I OF PART 98—DEFAULT EMISSION FACTORS FOR THRESHOLD APPLICABILITY DETERMINATION

Product type	Emission factors EF _i					
	CF ₄	C ₂ F ₆	CHF ₃	C ₃ F ₈	NF ₃	SF ₆
Semiconductors (kg/m ²)	0.90	1.00	0.04	0.05	0.04	0.20
LCD (g/m ²)	0.50	NA	NA	NA	0.90	4.00
MEMS (kg/m ²)	NA	NA	NA	NA	NA	1.02

Notes: NA denotes not applicable based on currently available information.

TABLE I-2 TO SUBPART I OF PART 98—EXAMPLES OF FLUORINATED GHGS AND FLUORINATED HEAT TRANSFER FLUIDS USED BY THE ELECTRONICS INDUSTRY

Product type	Fluorinated GHGs and fluorinated heat transfer fluids used during manufacture
Electronics	CF ₄ , C ₂ F ₆ , C ₃ F ₈ , c-C ₄ F ₈ , c-C ₄ F ₈ O, C ₄ F ₆ , C ₅ F ₈ , CHF ₃ , CH ₂ F ₂ , NF ₃ , SF ₆ , and fluorinated HTFs (CF ₃ -(O-CF(CF ₃)-CF ₂) _n -(O-CF ₂) _m -O-CF ₃ , C _n F _{2n+2} , C _n F _{2n+1} (O)C _m F _{2m+1} , C _n F _{2n} O, (C _n F _{2n+1}) ₃ N).

[77 FR 10381, Feb. 22, 2012]

TABLE I-3 TO SUBPART I OF PART 98—DEFAULT EMISSION FACTORS (1-U_{ij}) FOR GAS UTILIZATION RATES (U_{ij}) AND BY-PRODUCT FORMATION RATES (B_{ijk}) FOR SEMICONDUCTOR MANUFACTURING FOR 150MM AND 200 MM WAFER SIZES

Process type/Sub-type	Process gas i										
	CF ₄	C ₂ F ₆	CHF ₃	CH ₂ F ₂	C ₃ F ₈	c-C ₄ F ₈	NF ₃	SF ₆	C ₄ F ₆	C ₅ F ₈	C ₄ F ₈ O
Plasma Etching											
1-U _i	0.69	0.56	0.38	0.093	NA	0.25	0.038	0.20	0.14	NA	NA
BCF ₄	NA	0.23	0.026	0.021	NA	0.19	0.0040	NA	0.13	NA	NA
BC ₂ F ₆	NA	NA	NA	NA	NA	0.084	NA	NA	0.12	NA	NA
BC ₃ F ₈	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chamber Cleaning											
In situ plasma cleaning:											
1-U _i	0.92	0.55	NA	NA	0.40	0.10	0.18	NA	NA	NA	0.14
BCF ₄	NA	0.19	NA	NA	0.20	0.11	0.011	NA	NA	NA	0.13
BC ₂ F ₆	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.030
BC ₃ F ₈	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Remote plasma cleaning:											
1-U _i	NA	NA	NA	NA	NA	NA	0.018	NA	NA	NA	NA
BCF ₄	NA	NA	NA	NA	NA	NA	0.0047	NA	NA	NA	NA
BC ₂ F ₆	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BC ₃ F ₈	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
In situ thermal cleaning:											
1-U _i	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BCF ₄	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BC ₂ F ₆	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BC ₃ F ₈	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wafer Cleaning											
1-U _i	0.77	NA	NA	0.24	NA	NA	0.23	0.20	NA	NA	NA
BCF ₄	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BC ₂ F ₆	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BC ₃ F ₈	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes: NA denotes not applicable based on currently available information.