



CHAPTER 4 PACKAGE MATERIALS

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INTRODUCTION

Because of the growing concern for environmental, health, and safety issues, AMD, using the EIA Material Declaration Guide (February 2000) as a baseline, has analyzed the material content of its packages. The EIA Material Declaration Guide classifies materials into three categories: controlled materials, restricted materials, and materials of interest.

Controlled Materials. EIA defines "controlled materials" as "materials that are subject to either a legal ban or a voluntary industry prohibition" and includes a comprehensive listing of all such materials in Section A of its Material Declaration Guide. AMD's packages contain no material appearing in Section A of this guide (see the table beginning on *page 4-3* for a listing of these materials).

Restricted Materials. EIA defines "restricted materials" as "materials that are prohibited only in certain applications" and includes a comprehensive listing of all such materials in Section B of its Material Declaration Guide. AMD's packages contain no material appearing in Section B of this guide (see the table beginning on *page 4-8* for a listing of these materials).

Materials of Interest. EIA defines "materials of interest" as "materials for which the industry seeks disclosure in order to respond to customer and other inquiries" and includes a comprehensive listing of such materials in Section C of its Material Declaration Guide. A listing of these materials begins on *page 4-10*. AMD has identified which of these materials are found in each of its packages and reports its findings in the Material Declaration Data Sheets.

Material Declaration Data Sheets. Using the EIA Model Material Declaration Data Sheet as a template, AMD has created data sheets for some of its more popular package designs. These data sheets begin on *page 4-17*.

Controlled Materials Not Found in AMD Packages

Material	CAS Number
A1 - Asbestos/Asbestos Materials	
Asbestos and Asbestos Materials	1332-21-4
Actinolite	77536-66-4
Amosite (Grunerite)	12172-73-5
Anthophyllite	77536-67-5
Chrysotile	12001-29-5
Crocidolite	12001-28-4
Tremolite	77536-68-6
A2 - Class I: Ozone Depleting Substances/Isomers	
Trichlorofluoromethane (CFC 11)	75-69-4
Dichlorodifluoromethane (CFC12)	75-71-8
Chlorotrifluoromethane (CFC 13)	75-72-9
Pentachlorofluoroethane (CFC 111)	354-56-3
Tetrachlorodifluoroethane (CFC 112)	76-12-0
Trichlorotrifluoroethane (CFC 113) 1,1,2 Trichlorotrifluoroethane	354-58-5 76-13-1
Dichlorotetrafluoroethane (CFC 114)	76-14-2
Monochloropentafluoroethane (CFC 115)	76-15-3
Heptachlorofluoropropane (CFC 211)	422-78-6 135401-87-5
Hexachlorodifluoropropane (CFC 212)	3182-26-1
Pentachlorotrifluoropropane (CFC 213)	2354-06-5 134237-31-3
Tetrachlorotetrafluoropropane (CFC 214) 1,1,1,3-Tetrachlorotetrafluoropropane	29255-31-0 2268-46-4
Trichloropentafluoropropane (CFC 215) 1,1,1-Trichloropentafluoropropane 1,2,3-Trichloropentafluoropropane	1599-41-3 4259-43-2 76-17-5
Dichlorohexafluoropropane (CFC 216)	661-97-2
Monochloroheptafluoropropane (CFC 217)	422-86-6
Bromochlorodifluoromethane (Halon 1211)	353-59-3

Controlled Materials Not Found in AMD Packages (Continued)

Material	CAS Number
Bromotrifluoromethane (Halon 1301)	75-63-8
Dibromotetrafluoroethane (Halon 2402)	124-73-2
Carbon Tetrachloride (Tetrachloromethane)	56-23-5
1,1,1, - Trichloroethane (methyl chloroform) and its isomers except 1,1,2-trichloroethane	71-55-6
Bromomethane (Methyl Bromide)	74-83-9
Bromodifluoromethane and isomers (HBFC's)	1511-62-2
A3 - Class II: Hydrochlorofluorocarbons/ Isomers*	
Dichlorofluoromethane (HCFC 21)	75-43-4
Chlorodifluoromethane (HCFC 22)	75-45-6
Chlorofluoromethane (HCFC 31)	593-70-4
Tetrachlorofluoroethane (HCFC 121) 1,1,1,2-tetrachloro-2-fluoroethane (HCFC 121a) 1,1,2,2-tetracloro-1-fluoroethane	134237-32-4 354-11-0 354-14-3
Trichlorodifluoroethane (HCFC 122) 1,2,2-trichloro-1,1-difluoroethane	41834-16-6 354-21-2
Dichlorotrifluoroethane(HCFC 123) Dichloro-1,1,2-trifluoroethane 2,2-dichloro-1,1,1-trifluoroethane 1,2-dichloro-1,1,2-trifluoroethane (HCFC-123a) 1,1-dichloro-1,2,2-trifluoroethane (HCFC-123b) 2,2-dichloro-1,1,2-trifluoroethane (HCFC-123b)	34077-87-7 90454-18-5 306-83-2 354-23-4 812-04-4 812-04-4
Chlorotetrafluoroethane (HCFC 124) 2-chloro-1,1,1,2-tetrafluoroethane 1-chloro-1,1,2,2-tetrafluoroethane (HCFC 124a)	63938-10-3 2837-89-0 354-25-6
Trichlorofluoroethane (HCFC 131) 1-Fluoro-1,2,2-trichloroethane 1,1,1-trichloro-2-fluoroethane (HCFC131b)	27154-33-2;(134237-34-6) 359-28-4 811-95-0
Dichlorodifluoroethane (HCFC 132) 1,2-dichloro-1,1-difluoroethane (HCFC 132b) 1,1-dichloro-1,2-difluoroethane (HFCF 132c) 1,1-dichloro-2,2-difluoroethane 1,2-dichloro-1,2-difluoroethane	25915-78-0 1649-08-7 1842-05-3 471-43-2 431-06-1
Chlorotrifluoroethane (HCFC 133) 1-chloro-1,2,2-trifluoroethane 2-chloro-1,1,1-trifluoroethane (HCFC-133a)	1330-45-6 1330-45-6 75-88-7
Dichlorofluoroethane(HCFC 141) 1,1-dichloro-1-fluoroethane (HCFC-141b) 1,2-dichloro-1-fluoroethane	1717-00-6; (25167-88-8) 1717-00-6 430-57-9

Controlled Materials Not Found in AMD Packages (Continued)

Material	CAS Number
Chlorodifluoroethane (HCFC 142) 1-chloro-1,1-difluoroethane (HCFC142b) 1-chloro-1,2-difluoroethane (HCFC142a)	25497-29-4 75-68-3 25497-29-4
Hexachlorofluoropropane (HCFC 221)	134237-35-7
Pentachlorodifluoropropane (HCFC 222)	134237-36-8
Tetrachlorotrifluoropropane (HCFC 223)	134237-37-9
Trichlorotetrafluoropropane (HCFC 224)	134237-38-0
Dichloropentafluoropropane, (Ethyne, fluoro-) (HCFC 225) 2,2-Dichloro-1,1,1,3,3-pentafluoropropane (HCFC 225aa) 2,3-Dichloro-1,1,1,2,3-pentafluoropropane (HCFC 225ba) 1,2-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225bb) 3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC 225ca) 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC 225cb) 1,1-Dichloro-1,2,2,3,3-pentafluoropropane (HCFC 225cc) 1,2-Dichloro-1,1,3,3,3-pentafluoropropane (HCFC 225da) 1,3-Dichloro-1,1,2,3,3-pentafluoropropane (HCFC 225ea) 1,1-Dichloro-1,2,3,3,3-pentafluoropropane (HCFC 225eb)	127564-92-5; (2713-09-9) 128903-21-9 422-48-0 422-44-6 422-56-0 507-55-1 13474-88-9 431-86-7 136013-79-1 111512-56-2
Chlorohexafluoropropane (HCFC 226)	134308-72-8
Pentachlorofluoropropane (HCFC 231)	134190-48-0
Tetrachlorodifluoropropane (HCFC 232)	134237-39-1
Trichlorotrifluoropropane (HCFC 233) 1,1,1-Trichloro-3,3,3-trifluoropropane	134237-40-4 7125-83-9
Dichlorotetrafluoropropane (HCFC 234)	127564-83-4
Chloropentafluoropropane (HCFC 235) 1-Chloro-1,1,3,3,3-pentafluoropropane	134237-41-5 460-92-4
Tetrachlorofluoropropane (HCFC 241)	134190-49-1
Trichlorodifluoropropane (HCFC 242)	134237-42-6
Dichlorotrifluoropropane (HCFC 243) 1,1-dichloro-1,2,2-trifluoropropane 2,3-dichloro-1,1,1-trifluoropropane 3,3-Dichloro-1,1,1-trifluoropropane	134237-43-7 7125-99-7 338-75-0 460-69-5
Chlorotetrafluoropropane (HCFC 244) 3-chloro-1,1,2,2-tetrafluoropropane	134190-50-4 679-85-6
Trichlorofluoropropane (HCFC 251) 1,1,3-trichloro-1-fluoropropane	134190-51-5 818-99-5
Dichlorodifluoropropane (HCFC 252)	134190-52-6
Chlorotrifluoropropane (HCFC 253) 3-chloro-1,1,1-trifluoropropane (HCFC 253fb)	134237-44-8 460-35-5

Controlled Materials Not Found in AMD Packages (Continued)

Material	CAS Number
Dichlorofluoropropane (HCFC 261) 1,1-dichloro-1-fluoropropane	134237-45-9 7799-56-6
Chlorodifluoropropane (HCFC 262) 2-chloro-1,3-difluoropropane	134190-53-7 102738-79-4
Chlorofluoropropane (HCFC 271) 2-chloro-2-fluoropropane	134190-54-8 420-44-0
A4 - Polychlorinated Biphenyls (PCBs) and Terphenyls (PCTs)	
Polychlorinated Biphenyls	1336-36-3
Aroclor	12767-79-2
Chlorodiphenyl (Aroclor 1260)	11096-82-5
Kanechlor 500	27323-18-8
Aroclor 1254	11097-69-1
Terphenyls	26140-60-3
A5 - Polybrominated Biphenyls (PBBs) and their Ethers/Oxides	
Bromobiphenyl and its ethers	2052-07-5 (2-Bromobiphenyl) 2113-57-7 (3-Bromobiphenyl) 92-66-0 (4-Bromobiphenyl) 101-55-3 (ether)
Decabromobiphenyl and its ethers	13654-09-6 1163-19-5 (ether)
Dibromobiphenyl and its ethers	92-86-4 2050-47-7 (ether)
Heptabromobiphenylether	68928-80-3
Hexabromobiphenyl and its ethers	59080-40-9 36355-01-8 (hexabromo-1,1'-biphenyl) 67774-32-7 (Firemaster FF-1) 36483-60-0 (ether)
Nonabromobiphenylether	63936-56-1
Octabromobiphenyl and its ethers	61288-13-9 32536-52-0 (ether)
Pentabromobidphenyl ether (Note: Commercially available PeB-DPO is a complex reaction mixture containing a variety of brominated diphenyloxides.)	32534-81-9 (CAS number used for commercial grades of PeBDPO)
Polybrominated Biphenyls	59536-65-1
Tetrabromobiphenyl and its ethers	40088-45-7 40088-47-9 (ether)

Controlled Materials Not Found in AMD Packages (Continued)

Material	CAS Number
Tribromobiphenyl ether	49690-94-0
A6 – Certain Ethylene Glycol Ethers	
2-Ethoxyethanol	110-80-5
2-Ethoxyethyl acetate	111-15-9
2-Methoxyethanol	109-86-4
2-Methoxyethyl acetate	110-49-6
Diethylene glycol dimethyl ether	111-96-6

Note: Materials may contain isomers that are not listed here. Isomers with CAS numbers have been included when available.

Restricted Materials Not Found in AMD Packages

Material: Banned Uses	CAS Number
B1 - Cadmium and its Compounds: Dyes, Paints, Packaging Inks, Plastic Parts > 25 grams	
Cadmium	7440-43-9
Examples of Common Cadmium Compounds	
Cadmium oxide	1306-19-0
Cadmium sulfide	1306-23-6
B2 - Chromium VI and its Compounds: Packaging/Packaging Inks	
Chromium	7440-47-3
Examples of Common Chromium Compounds	
Barium chromate	10294-40-3
Calcium chromate	13765-19-0
Chromic acetate	1066-30-4
Chromium trioxide	1333-82-0
Lead chromate	7758-97-6
Sodium chromate	7775-11-3
Sodium dichromate	10588-01-9
Strontium chromate	7789-06-2
Zinc chromate	13530-65-9
B 3 - Lead and its Compounds: Paints, Packaging/Packaging Inks	
Lead	7439-92-1
Examples of Common Lead Compounds	
Lead sulfate	7446-14-2
Lead carbonate	598-63-0
Lead hydrocarbonate	1319-46-6
Lead acetate	301-04-2
Lead (II) acetate, trihydrate	6080-56-4
Lead phosphate	7446-27-7
Lead selenide	12069-00-0

Restricted Materials Not Found in AMD Packages (Continued)

Material: Banned Uses	CAS Number
B4 - Mercury and its Compounds: All uses are restricted except lamps.	
Mercury	7439-97-6
Examples of Common Mercury Compounds	
Mercuric chloride	33631-63-9
Mercury bichloride	7487-94-7
Mercuric sulfate	7783-35-9
Mercuric nitrate	10045-94-0
Mercuric oxide	21908-53-2
Mercuric sulfide	1344-48-5

EIA Materials of Interest

Material	CAS Number
C1 - METALS/METAL COMPOUNDS	
C1a - Antimony and its Compounds	
Antimony (metallic)	7440-36-0
Examples of Common Antimony Compounds	
Antimony trioxide	1309-64-4
Antimony pentoxide	1314-60-9
C1b - Arsenic and its Compounds	
Arsenic	7440-38-2
Examples of Common Arsenic Compounds	
Gallium arsenide	1303-00-0
Calcium arsenate	7778-44-1
Calcium arsenite	27152-57-4
Arsenic pentoxide	1303-28-2
Arsenic trioxide	1327-53-3
Potassium arsenite	10124-50-2
Potassium arsenate	7784-41-0
Lead arsenate	3687-31-8
C1c - Beryllium and its Compounds	
Beryllium	7440-41-7
Examples of Common Beryllium Compounds	
Beryllium-aluminum alloy	12770-50-2
Beryllium chloride	7787-47-5
Beryllium fluoride	7787-49-7
Beryllium hydroxide	13327-32-7
Beryllium oxide	1304-56-9
Beryllium phosphate	13598-15-7
Beryllium sulfate	13510-49-1
Beryllium sulfate tetrahydrate	7787-56-6

EIA Materials of Interest (Continued)

Material	CAS Number
Beryl ore	1302-52-9
C1d - Cadmium and its Compounds	
Cadmium	7440-43-9
Examples of Common Cadmium Compounds	
Cadmium carbonate (Carbonic acid)	513-78-0
Cadmium chloride	10108-64-2
Cadmium fluoroborate	14486-19-2
Cadmium nitrate (Cadmium salt)	10325-94-7
Cadmium oxide	1306-19-0
Cadmium sulfate (Sulfuric acid)	10124-36-4
Cadmium sulfide	1306-23-6
C1e - Chromium VI and its Compounds	
Chromium	7440-47-3
Examples of Common Chromium Compounds	
Barium chromate	10294-40-3
Calcium chromate	13765-19-0
Chromic acetate	1066-30-4
Chromium trioxide	1333-82-0
Lead chromate	7758-97-6
Sodium chromate	7775-11-3
Sodium dichromate	10588-01-9
Strontium chromate	7789-06-2
Zinc chromate	13530-65-9
C1 f - Lead and its Compounds	
Lead	7439-92-1
Examples of Common Lead Compounds	
Lead sulfate	7446-14-2
Lead carbonate	598-63-0

EIA Materials of Interest (Continued)

Material	CAS Number
Lead hydrocarbonate	1319-46-6
Lead acetate	301-04-2
Lead (II) acetate, trihydrate	6080-56-4
Lead phosphate	7446-27-7
Lead selenide	12069-00-0
C1g - Mercury and its Compounds	
Mercury	7439-97-6
Examples of Common Mercury Compounds	
Mercuric chloride	33631-63-9
Mercury bichloride	7487-94-7
Mercuric sulfate	7783-35-9
Mercuric nitrate	10045-94-0
Mercuric oxide	21908-53-2
Mercuric sulfide	1344-48-5
C1h - Nickel and its Compounds	
Nickel	7440-02-0
Examples of Common Nickel Compounds	
Nickel acetate	373-02-4
Nickel carbonate	3333-67-3
Nickel carbonyl	13463-39-3
Nickel hydroxide	12054-48-7 or 11113-74-9
Nickelocene	1271-28-9
Nickel oxide	1313-99-1
Nickel subsulfide	12035-72-2
C1i - Magnesium and its Compounds	
Magnesium	7439-95-4
Examples of Common Magnesium Compounds	
Magnesium oxide	1309-48-4

EIA Materials of Interest (Continued)

Material	CAS Number
Magnesium sulfate	7487-88-9
Magnesium (II) nitrate	10377-60-3
Magnesite	13717-00-5
C1j - Selenium and its Compounds	
Selenium and materials	7782-49-2
Examples of Common Selenium Compounds	
Hydrogen selenide	7783-07-5
Sodium selenide	1313-85-5
Selenium dioxide	7446-08-4
Sodium selenate	10112-94-4
Dimethyl selenide	593-79-3
Selenium oxide	12640-89-0
C1k - Copper and its Compounds	
Copper	7440-50-8
Examples of Common Copper Materials	
Copper sulfate	7758-98-7
Cupric carbonate	1184-64-1
Cupric oxide	1317-38-0
Copper sulfide	1317-40-4
C1l - Gold and its Compounds	
Gold	7440-57-5
Examples of Common Gold Materials	
Gold oxide	1303-58-8
Gold cyanide	506-65-0
Gold (III) chloride	13453-07-1
Gold (III) bromide	10294-28-7
C1m - Palladium and its Compounds	
Palladium	7440-05-3

EIA Materials of Interest (Continued)

Material	CAS Number
Examples of Common Palladium Materials	
Palladium (II) chloride	7647-10-1
Palladium (II) bromide	13444-94-5
Palladium (II) iodide	7790-38-7
Palladium (II) oxide	1314-08-5
C1n - Silver and its Compounds	
Silver	7440-22-4
Examples of Common Silver Materials	
Silver (I) fluoride	7775-41-9
Silver (II) fluoride	7783-95-1
Silver (I) chloride	7783-90-6
Silver (I) bromide	7785-23-1
Silver (I) iodide	7783-96-2
Silver (I) oxide	20667-12-3
Silver (I) peroxide	25455-73-6
Silver (II) oxide	1301-96-8
Silver nitrate	7761-88-8
Silver acetate	563-63-3
Silver sulfate	10294-26-5
Silver cyanide	506-64-9
C2 - FLAME RETARDANT MATERIALS	
C2a – Organophosphorous Compounds	
Triaryl Phosphates	Various
Trimethyl Phosphates	512-56-1
Triphenyl Phosphates	115-86-6
Bisphenol A diphenylphosphate	Various
Resorcinol Diphosphate	57583-54-7

EIA Materials of Interest (Continued)

Material	CAS Number
C2b – Tetrabromobisphenol A	
Tetrabromobisphenol A (TBBA)	79-94-7
C2c – All other organic or inorganic substances used as	
Aluminum hydrate	21645-51-2
Zinc Borate	1332-07-6
Melamine	108-78-1
Red Phosphorus	7723-14-0
Talc	14807-96-6
C3 – ORGANIC MATERIALS	
C3a - Chloroparaffins	
Chloroparaffins	8029-39-8
C3b - Phthalates	
Diisononyl Phthalate (DINP)	28553-12-0
Di-sec-octyl phthalate (DEHP)	117-81-7
Dibutyl phthalate (DBP)	84-74-2
Diisodecyl phthalate	26761-40-0
Bis(n-octyl) Phthalate (DNOP)	117-84-0
Butyl benzyl phthalate (BBP)	85-68-7
C3c - Azo-Based Materials	
Benzidene and its salts	92-87-5
4-Aminodiphenyl and its salts	92-67-1
4-Chloro-o-toluidine (4-chloro-2-methylaniline)	95-69-2
2-Naphthylamine	91-59-8
o-Aminoazotoluene	97-56-3
2-Amino-4-nitrotoluene	99-55-8
p-Chloroaniline	106-47-8
2,4-Diaminoanisole	615-05-4
4,4'-Diaminodiphenylmethane	101-77-9

EIA Materials of Interest (Continued)

Material	CAS Number
3,3'-Dichlorobenzidene	91-94-1
3,3'-Dimethoxybenzidine	119-90-4
3,3,'-Dimethylbenzidene	119-93-7
3,3'-Dimethyl-4,4' diaminodiphenylmethane	838-88-0
p-Cresidene (5-Methyl-o-Anisidine)	120-71-8
4,4'Methylenebis-(2-chloroaniline)	101-14-4
4,4'-Oxydianiline	101-80-4
4,4'-Thiodianilene (4,4'-thiobisbenzenamine)	139-65-1
o-Toluidine	95-53-4
2,4-Toluylenediamine (Toluene-2,4-Diamine)	95-80-7
2,4,5-Trimethylaniline	137-17-7
C3d – Chlorinated Polymers	
Poly vinyl chloride (PVC)	9002-86-2