

## **1.0 Purpose**

SanDisk is committed through its environmental management policy to provide products that meet our SanDisk Green requirements as defined in this document.

This document is based on worldwide environmental compliance and OEM customer requirements.

This policy applies to all SanDisk parts and materials that are purchased by SanDisk and used in SanDisk products, effective September 30, 2008. This is applicable to SanDisk direct suppliers, contracted manufacturers, and second-tier suppliers to SanDisk contracted manufacturers.

This policy is divided into three product categories:

### **Product Category 1 [refer to Section 6]:**

- Removable cards [Secure Digital, Memory Stick, Compact Flash, USB flash drives, MegaSIM cards etc...]
- Embedded products [iNAND, mDOC etc...]
- Component IC product [TSOP, QFN, BGA , QFP, Controller IC etc...]
- Card product accessories [lanyards for card products, plastic caps etc...]
- Card product packaging materials [jewel cases, shipping trays, shipping labels, insert, clamshells, boxes etc..]
- Card adapters

### **Product Category 2 [refer to Section 7]:**

- Audio video products [MP3 players, docking stations, digital picture viewers, TakeTV etc...]
- Audio video accessories [headphones, lanyards for AV products, chargers, batteries, CD, cables, skins etc...]
- Audio video packaging materials [jewel cases, shipping trays, shipping labels, insert, clamshells, boxes etc...]
- Card readers

### **Product Category 3 [refer to Section 8]:**

- Solid State Drive products [SSD, uSSD, pSSD etc...] and all included components
- Solid State Drive products packaging materials [shipping trays, shipping labels, insert, boxes etc..]

## **2.0 Scope**

This procedure applies to all parts and materials used in SanDisk products.

## **3.0 Responsibilities**

**Primary Owner, Department:** Corporate Quality Systems

**Reviewers and Approvers:**

Approved representatives of Supplier Quality Engineering, Packaging Engineering, Customer Quality, BU Quality, Environmental Management System, and Procurement

#### 4.0 Reference Documents and Source Locations

Not Applicable

#### 5.0 Definitions and Acronyms

Table 5.1: Definitions and Acronyms

Term	Definition
<b>Controlled</b>	SanDisk prohibits the use of these controlled substances with the homogeneous concentration above the threshold level stated
<b>Reportable</b>	SanDisk requires disclosure of the presence of reportable substances at the homogeneous level in the form of MDDS if over the threshold level stated
<b>Threshold Level</b>	Concentration level which defines the limit (equal to or) above which the presence of a substance in parts and materials are: 1) prohibited in controlled substances; or 2) must be declared in the form of MDDS in reportable substances  Concentrations are all identified in homogeneous level
<b>MDDS</b>	Material Declaration Data Sheet: form to disclose the full chemical content of a part or material at homogeneous level
<b>ICP</b>	Inductively Coupled Plasma: chemical analysis method
<b>SGS</b>	Worldwide Testing and Analysis Laboratories
<b>OEM</b>	Original Equipment Manufacturer
<b>RoHS</b>	Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment
<b>CoC</b>	Certificate of Compliance
<b>Packaging</b>	All products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer. 'Non-returnable' items used for the same purposes shall also be considered to constitute packaging.  'Packaging' consists only of: (a) sales packaging or primary packaging ... (b) grouped packaging or secondary packaging ... (c) transport packaging or tertiary packaging ...

## 6.0 Green Requirements on Product Category 1

### 6.1 Controlled Substances

Table 6.1a SanDisk Controlled Substances in Parts/Materials and/or Production Process

	<b>Controlled Substances</b>	<b>Threshold Level (ppm by weight)</b>
6.1	Antimony/Antimony Compounds	900
6.2	Arsenic/Arsenic Compounds	1000
6.3	Asbestos	5
6.4	Bromine and other Brominated compounds	900
6.5	Cadmium/Cadmium Compounds	100
6.6	Certain Azo Colorants and Azodyes	30
6.7	Certain Phthalates (DEHP, DOP, DBP, BBP, DINP, DIDP, DNOP, DNHP) Applicable to products targeted to be used by age 14 and under	0
6.8	Certain Shortchain Chlorinated Paraffins (SCCP)	900
6.9	Chlorine and other Chlorinated compounds	900
6.10	Ethylene Glycol Monoethyl Ether and its acetate	5
6.11	Ethylene Glycol Monomethyl Ether and its acetate	5
6.12	Formaldehyde	0
6.13	Halogenated Dioxins and Furans	900
6.14	Hexavalent Chromium/Hexavalent Chromium Compounds	1000
6.15	Lead/Lead Compounds	1000
6.16	Mercury/Mercury Compounds	1000
6.17	Ozone Depleting Substances- Class I (CFCx, HBFCs, etc)	0
6.18	Ozone Depleting Substances- Class II (HCFCs)	0
6.19	Perfluorooctane sulfonate (PFOS) and PFOS-related compounds	1000
6.20	Polybrominated Biphenyls (PBBs)	1000
6.21	Polybrominated Diphenylethers (PBDEs) including DecaBDE	1000
6.22	Polychlorinated Biphenyls (PCB)	900
6.23	Polychlorinated Terphenyls (PCT)	900
6.24	Polychlorinated Naphthalenes (PCNs >3 chlorine atoms)	900
6.25	Radioactive Substances	0
6.26	Tributyl Tin (TBT) and Triphenyl Tin (TPT)	0
6.27	Tributyl Tin Oxide (TBTO)	0

**Notes:**

- "Chlorine" includes, but not limited to, Polyvinyl Chloride (PVC), and other chlorinated compounds.
- "Bromine" includes, but not limited to, Brominated Flame Retardants (other than PBBs or PBDEs), Tetrabromobisphenol A (TBBPA), Hexabromocyclododecane (HBCDD), Hexabromobenzene, and other brominated compounds.
- "Antimony" includes Antimony and all its compounds (typically Antimony Trioxide).

Table 6.1b SanDisk Controlled Substances in Packaging Materials

	<b>Controlled Substances</b>	<b>Threshold Level (ppm by weight)</b>
6.28	Cadmium, Mercury, Lead and Hexavalent Chromium	Sum: 100
6.29	Perfluorooctane sulfonate (PFOS) and PFOS-related compounds	1000
6.30	Polyvinyl Chloride (PVC) Applicable to Europe and Japan regions only	900

**6.2 Reportable Substances**

Table 6.2 SanDisk Reportable Substances in Parts/Materials and/or Production Process

	<b>Reportable Substances</b>	<b>Threshold Level (ppm by weight)</b>
6.31	Aliphatic CHCs	1000
6.32	Benzene	1000
6.33	Beryllium/Beryllium Compounds	1000
6.34	Bismuth/Bismuth Compounds	1000
6.35	Bisphenol A	1000
6.36	Dimethoxyethyl Phthalate (DMEP)	1000
6.37	Cobalt/Cobalt Compounds	1000
6.38	Hydrofluorocarbon (HFC)	1000
6.39	Natural Rubber	1000
6.40	Nickel/Nickel Compounds	1000
6.41	NonylPhenols and Nonylphenol Ethoxylates	1000
6.42	Perchlorate	1000
6.43	Perfluorocarbon (PFC)	1000
6.44	Perfluorooctanoic Acid (PFOA)	1000
6.45	Selenium/Selenium Compounds	1000

**7.0 Green Requirements on Product Category 2**

**7.1 Controlled Substances**

Table 7.1a SanDisk Controlled Substances in Parts/Materials and/or Production Process

	<b>Controlled Substances</b>	<b>Threshold Level (ppm by weight)</b>
7.1	Arsenic/Arsenic Compounds	1000
7.2	Asbestos	5
7.3	Cadmium/Cadmium Compounds	100
7.4	Certain Azo Colorants and Azodyes	30
7.5	Certain Phthalates (DEHP, DOP, DBP, BBP, DINP, DIDP, DNOP, DNHP) Applicable to products targeted to be used by age 14 and under	0
7.6	Certain Shortchain Chlorinated Paraffins (SCCP)	900
7.7	Ethylene Glycol Monoethyl Ether and its acetate	5
7.8	Ethylene Glycol Monomethyl Ether and its acetate	5
7.9	Halogenated Dioxins and Furans	900
7.10	Hexavalent Chromium/Hexavalent Chromium Compounds	1000
7.11	Lead/Lead Compounds	1000
7.12	Mercury/Mercury Compounds	1000
7.13	Ozone Depleting Substances- Class I (CFCx, HBFCs, etc)	0
7.14	Ozone Depleting Substances- Class II (HCFCs)	0
7.15	Perfluorooctane sulfonate (PFOS) and PFOS-related compounds	1000
7.16	Polybrominated Biphenyls (PBBs)	1000
7.17	Polybrominated Diphenylethers (PBDEs) including DecaBDE	1000
7.18	Polychlorinated Biphenyls (PCB)	900
7.19	Polychlorinated Terphenyls (PCT)	900
7.20	Polychlorinated Naphthalenes (PCNs >3 chlorine atoms)	900
7.21	Radioactive Substances	0
7.22	Tributyl Tin (TBT) and Triphenyl Tin (TPT)	0
7.23	Tributyl Tin Oxide (TBTO)	0



Table 7.1b SanDisk Controlled Substances in Packaging Materials

	<b>Controlled Substances</b>	<b>Threshold Level (ppm by weight)</b>
7.24	Cadmium, Mercury, Lead and Hexavalent Chromium	Sum: 100
7.25	Perfluorooctane sulfonate (PFOS) and PFOS-related compounds	1000

Table 7.1c SanDisk Controlled Substances in Batteries

	<b>Controlled Substances</b>	<b>Threshold Level (ppm by weight)</b>
7.26	Mercury	5
7.27	Cadmium	20
7.28	Lead	40
7.29	Perchlorate	0

## 8.0 Green Requirements on Product Category 3

### 8.1 Controlled Substances

Table 8.1a SanDisk Controlled Substances in Parts/Materials and/or Production Process

	Controlled Substances	Threshold Level (ppm by weight)
8.1	Antimony/Antimony Compounds	900
8.2	Arsenic/Arsenic Compounds	1000
8.3	Asbestos	0
8.4	Brominated Flame Retardants (other than PBBs or PBDEs)	900
8.5	Bromine and other Brominated compounds	900
8.6	Cadmium/Cadmium Compounds	75/ 50 for EPEAT products/ 0 in plating and surface coating
8.7	Certain Azo Colorants and Azodyes	30
8.8	Certain Phthalates (DEHP, DOP, DBP, BBP, DINP, DIDP, DNOP, DNHP). Applicable to products targeted to be used by age 14 and under	0
8.9	Certain Shortchain Chlorinated Paraffins (SCCP)	900
8.10	Chlorine and other Chlorinated compounds	900
8.11	Ethylene Glycol Monoethyl Ether and its acetate	5
8.12	Ethylene Glycol Monomethyl Ether and its acetate	5
8.13	Formaldehyde	0
8.14	Halogenated Aromatic Substances	For capacitors and transformers above 500 for monohalogenated or 50 for polyhalogenated aromatic substance in materials of the component
8.15	Halogenated Dioxins and Furans	0
8.16	Halogenated Diphenyl Methanes	0
8.17	Hexachloroethane	0 in manufacturing or processing of nonferrous metals
8.18	Hexavalent Chromium/Hexavalent Chromium Compounds	1000 in non-metallic/ 0 in metallic application, paints and plastic resin/ 500 for EPEAT products
8.19	Lead/Lead Compounds	1000/ 100 in paint/

		50 in VDUs for EPEAT products
8.20	Mercury/Mercury Compounds	0
8.21	Nickel/Nickel Compounds	0 on surfaces that are designed to be in prolonged contact with skin
8.22	Ozone Depleting Substances- Class I (CFCx, HBFCs, etc)	0
8.23	Ozone Depleting Substances- Class II (HCFCs)	0
8.24	Perfluorocarbon (PFC)	0
8.25	Perfluorooctane sulfonate (PFOS) and PFOS-related Compounds and Perfluoro Alkyl Sulfonates (PFAS)	100 Products/ 50 for chemical substances and preparation
8.26	Polybrominated Biphenyls (PBBs).	0
8.27	Polybrominated Diphenylethers (PBDEs) including DecaBDE	0
8.28	Polychlorinated Biphenyls (PCBs)	0
8.29	Polychlorinated Naphthalenes (PCNs >3 chlorine atoms)	0
8.30	Polychlorinated Terphenyls (PCT)	0
8.31	Polyvinyl Chloride (PVC)	0
8.32	Radioactive Substances	0
8.33	Tributyl Tin (TBT) and Triphenyl Tin (TPT)	0
8.34	Tributyl Tin Oxide (TBTO)	0

Table 8.1b SanDisk Controlled Substances in Packaging Materials

	<b>Controlled Substances</b>	<b>Threshold Level (ppm by weight)</b>
8.35	Cadmium, Mercury, Lead, Hexavalent Chromium and Brominated Flame Retardants (including PBB, PBDE, TBBA, TBBPA and HBCDD)	Sum:100
8.36	Chlorinated Paraffins	0
8.37	Arsenic/Arsenic Compounds	0
8.38	Asbestos	0
8.39	Brominated Flame Retardants (all BFRs in external case plastic parts)	0
8.40	Brominated Flame Retardants (PBBs, PBDEs including DecaBDE)	0
8.41	Cadmium/Cadmium Compounds	0
8.42	Certain Azo Colorants	0
8.43	Chlorinated Hydrocarbons	0
8.44	Expanded Polystyrene (EPS) Foam	0
8.45	Halogenated Diphenyl Methanes	0
8.46	Halogenated Plastics or Polymers	0

8.47	Hexavalent Chromium/Hexavalent Chromium Compounds	0
8.48	Lead/Lead Compounds	0
8.49	Mercury/Mercury Compounds	0
8.50	Methyl Bromide for fumigation	0
8.51	Nickel on external surfaces	0
8.52	Ozone Depleting Substances (Class I & Class II CFCs and HCFCs)	0
8.53	Perfluorooctane sulfonate (PFOS) and PFOS-related Compounds	0
8.54	Polybrominated Biphenyls (PBBs)	0
8.55	Polychlorinated Biphenyls (PCBs)	0
8.56	Polychlorinated Terphenyls (PCT)	0
8.57	Polyvinyl Chloride (PVC)	0
8.58	Radioactive Substances	0
8.59	Tributyl Tin (TBT) and Triphenyl Tin (TPT)	0
8.60	Tributyl Tin Oxide (TBTO)	0

## 8.2 Reportable Substances

Table 8.2 SanDisk Reportable Substances in Parts/Materials and/or Production Process

	<b>Reportable Substances</b>	<b>Threshold Level (ppm by weight)</b>
8.61	4-Aminobiphenyl	100
8.62	Aliphatic CHCs	1000
8.63	Aluminum/Aluminum Compounds	100
8.64	Amines, Aliphatic	100
8.65	Aniline Salts	100
8.66	Anthracene	100
8.67	Aromatic Amines and Dyes	100
8.68	Aromatic Compounds as monomers (except where listed separately)	100
8.69	Barium Compounds (except barium sulfate)	100
8.70	Benzene	1000
8.71	Beryllium/Beryllium Compounds	100
8.72	Dimethoxyethyl Phthalate (DMEP)	1000
8.73	Bismuth/Bismuth Compounds	100
8.74	Bisphenol A	1000
8.75	Chromium(III) and Chromium Compounds	100
8.76	Cobalt/Cobalt Compounds	100
8.77	Copper/Copper Compounds	100



**Title: SanDisk Green Policy on Controlled and Reportable Substances for Parts and Materials**

8.78	Ferrosilicon and Alloys	100
8.79	Gold/Gold Compounds	100
8.80	Halogenated Aromatic Compounds as monomers (Including Polychlorinated Naphthalenes)	100
8.81	Hydrofluorocarbon (HFC)	100
8.82	Iron/Iron Compounds	100
8.83	Magnesium/Magnesium Alloys	100
8.84	Natural Rubber	1000
8.85	Nickel/Nickel Compounds (except surfaces that are designed to be in prolonged contact with skin)	100
8.86	NonylPhenols and Nonylphenol Ethoxylates	100
8.87	Organic Azo and Azo-oxy Compounds	100
8.88	Organic Halogen Compounds (except where listed separately)	100
8.89	Organic Phosphorous Compounds	100
8.90	Organic Silicon Compounds	100
8.91	Palladium/Palladium Compounds	100
8.92	Perchlorate	1
8.93	Perchlorates	6ppb
8.94	Perfluorocarbon (PFC)	100
8.95	Perfluorooctanoic Acid (PFOA)	100
8.96	Polybrominated Terphenyls	100
8.97	Selenium/Selenium Compounds	100
8.98	Silver/Silver compounds	100
8.99	Small Fibers (For all products containing fibers or fibrils 5 microns or less in diameter with a length:diameter ratio equal to or greater than 3:1)	100
8.100	Sulfur Hexafluoride	100
8.101	Tantalum/Tantalum Compounds	100
8.102	Tellurium/Tellurium Compounds	100
8.103	Tetramethylthiuram Disulfide (Thiram)	100
8.104	Thallium/Thallium Compounds	100
8.105	Tin/Tin Compounds (Except TBT, TPT, or TBTOs)	100
8.106	Zinc/Zinc Compounds	100

## 9.0 Requirements for Suppliers

- Procurement of Green Materials
  - SanDisk policy requires all suppliers for SanDisk parts and materials to comply with these green requirements.
  - All suppliers are required to provide all of the following documents for every item supplied to SanDisk or any SanDisk contracted manufacturers 1) for all newly-qualified part numbers, at the time of first article submission stage; and 2) for all existing part numbers, before September 30, 2008:
    1. material declaration data sheet (MDDS) in SanDisk format [refer to the new format in Section 12]; and
    2. signed certificate of compliance (CoC) for all substances listed in this document [refer to the new format in Section 14];
    3. If any homogeneous material(s) in the MDDS with any substances listed as proprietary information or not identified with CAS numbers [refer to Section 13]:
      - a) For **Product Categories 1 and 3**: homogeneous level chemical analysis lab test reports (e.g. SGS reports) showing the concentration of lead, mercury, cadmium, chromium (VI), PBB, PBDE, chlorine, bromine, and antimony
      - b) For **Product Category 2**: homogeneous level chemical analysis lab test reports (e.g. SGS reports) showing the concentration of lead, mercury, cadmium, chromium (VI), PBB, and PBDE
  - In addition, component and/or homogeneous chemical analysis lab test reports (e.g. SGS reports) of controlled/reportable substances listed in this document for all parts supplied to SanDisk within fifteen (15) business days, upon request. SanDisk maintains an ongoing green monitoring program and will execute these requests under this program.
  - MDDS must have resolution at the homogeneous material level [refer to Section 11] and must provide applicable CAS numbers to all substances listed. All fields in the SanDisk MDDS format must be completed. All submitted MDDS will be reviewed and approved by SanDisk Supplier Quality.
  - Any exception to this requirement has to be approved in writing by Director of Procurement and Director of Quality Systems.
  - Any changes of materials must go through supplier process change notification process in which updated documents must be provided by suppliers.
- Periodic Auditing
  - SanDisk periodically performs chemical analyses on samples taken from product families to ensure that SanDisk Green compliance is being maintained.
- Verification of New Products
  - SanDisk reviews the compliance of new products to these requirements before release.

## **10.0 EU RoHS Exemptions**

SanDisk takes into account for all current EU RoHS Exemptions. For any RoHS-exempted parts that are provided by the suppliers, suppliers must define specific EU exemptions taken on the MDDS submitted to SanDisk.

## **11.0 Homogeneous Material Definition and Examples**

See link on SanDisk.com website

## **12.0 SanDisk MDDS Format**

See link on SanDisk.com website

## **13.0 Chemical Analysis Lab Test Report Template**

See link on SanDisk.com website

## **14.0 Certificate of Compliance to SanDisk Green Policy Template (rev. 7)**

See link on SanDisk.com website