Product Chemical Content Brochure

Dear Customer and Supplier

ON Semiconductor being, a global manufacturer and supplier of semiconductors, complies with all relevant environmental, safety and health regulations and directives applicable to the country of manufacture and sale.
ON Semiconductor provides the detailed material composition, based on the homogenous or piece parts contained in its products. This information are available on the following web site by searching for its orderable part numbers:
http://www.onsemi.com/PowerSolutions/MaterialComposition.do

This brochure contains lists of chemicals that are prohibited in our products and in manufacturing. This list is designed to meet ON Semiconductor's compliance with all applicable environmental, health and safety regulations of the countries where it operates and does business. It is also in concert with the needs of our customers for environmentally friendly products and in reduction in use of hazardous materials in the manufacture of these products. To help us meet these objectives, we are requiring our suppliers to restrict the use and content of the listed chemicals in the raw materials and products supplied to ON Semiconductor.

ON Semiconductor meets the requirements of the **European Union Directive on the Restrictions on use of certain Hazardous Substances 2011/65/EU (RoHS2) and the Directive 2015/863/EU amending Annex II to Directive 2011/65/EU as regards the list of restricted substances.**
ON SEMICONDUCTOR meets all applicable REACH (Registration, Evaluation, Authorization and Restriction of Chemical substances) requirements and is committed to provide information about substances in its products as required. ON SEMICONDUCTOR meets the requirements of China's Management Measures on Electronic information Product Pollution Control (China-RoHS) regulation.
More information on compliance with "China-RoHS" is available at:
http://www.onsemi.com/PowerSolutions/MaterialCompositionChina.do

ON Semiconductor has implemented products Take-back and Recycle Program to provide its customers with an environmentally responsible solution for the return, recycling and disposal of its products. This brochure provides further information on this program.

Take-Back and Recycle Policy

ON Semiconductor Take-back and Recycle Program provides ON Semiconductor customers with an environmentally responsible solution for the return, recycling and disposal of its products, including its evaluation printed circuit boards. This program is designed to ensure compliance with the current and forthcoming regional regulations involving producer responsibility for recycling and proper disposal of electronic waste products.
To return ON Semiconductor products and evaluation printed circuit boards for recycling and disposal, please include the following information and ship the items to return to the shipping address noted.
Please visit ON Semiconductor web site for further details:
http://www.onsemi.com/PowerSolutions/content.do?id=15055
NOTE: Please be aware this is not a tool to return our products for trade-ins or warranty or other product/ performance related issues.

1. Information needed when sending back parts:
- Part #s
- Quantities
- Customer address / contact info

2. The parts may be returned to:
ON Semiconductor Reclaim Center
West P-dock, Attn: Dale Love
5005 E. McDowell Rd.
Phoenix, Az. 85008

*Delivery address for precious metals is:
ON Semi Reclaim Center
D-dock vault
Attn: Dan Dugi/Dale Love
5005 E. McDowell Rd.
Phoenix, Az. 85008

Contact: OSRC Main Number: 602-244-7370, or

AL Falk : 602-244-7360
Mobile : 602-819-6683 Email: Al.falk@onsemi.com

Through the release of this information, we hope to provide relevant data to help our customers in their evaluation of the potential environmental impact, in the proper end-of –life assessment and management of the products. It is our hope that this information will provide answers to the most frequently asked questions about the use or presence of the banned, restricted or hazardous materials in our products.

We have made all efforts to reasonably estimate amounts of all significant chemicals present in our products. The products may contain trace levels of unintentional impurities.

Note: Even though all possible efforts have been made to provide you the most accurate information, we cannot guarantee to its completeness and accuracy due to the fact that the data has been compiled based on the ranges provided and some information not provided by the subcontractors and raw material suppliers to protect their business proprietary information.

Based on the above considerations, this information is provided only as estimates of the average weight of these parts and the anticipated significant toxic metals components. Trace levels of dopant and metal materials contained within silicon wafers in the finished product are not included.

Product Material Composition

The material composition table helps readers to find readily the concentrations of the materials, intentionally-added, and present in significant quantities. The matrix does not list the materials or their quantity, present as impurities, normally found in trace levels in the raw materials used in manufacture of the product.
If you require additional information, please contact your ON Semiconductor Account Manager and /or Product Stewardship Team.

Flammability of the Mold Compounds

All epoxy resins used by ON Semiconductor meet the flammability rating UL94 – VO at 1/8 inch class.
Liquid Mold compound used in Wafer Level assemblies (molded- chip scale), meets UL 94-HB

Restricted Substance Requirements

Suppliers to ON Semiconductor must ensure that all materials used in part manufacture and in facility operations satisfy all applicable environmental, health and safety government regulations and directives, including European Union Directive on the Restrictions on use of certain Hazardous Substances (RoHS), on restricted, toxic and hazardous materials. Suppliers must be prepared to provide supporting evidence of conformance.

Product supplied to ON Semiconductor, including recycled materials, must not be processed with or intentionally contain any of the restricted materials listed in this brochure.

Environmentally Restricted Substances

APPLICABLE REFERENCE DOCUMENTS

- Canadian Environmental Protection Act 1999 California Proposition 65
- Danish Executive Order No 1113
- Decree No. 2012-232 - Mandatory Reporting of Nanoparticulate Substances Placed on the Market
- Directive 2000/53/EC on the end-of life vehicles.
- Directive 94/62/EC on Packaging and Packaging Waste and subsequent amendments
- Directive 96/29 Euratom – Ionizing Radiation
- EU Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations and its amendments
- EC Regulation No. 2307/2000 on substances that deplete the ozone layer
- EC Regulation No. 850/2004 on persistent organic pollutants – POPs Regulation
- EU Directive 2002/61/EC of July 2002 - restriction of Azo colorants and dyes
- Directive 2011/65/EU on the Restriction of Hazardous Substances in Electrical and Electronic Equipment
- EU Directive 91/338/EEC restrictions on the use of Cadmium and its amendments
- EU regulation No. 995/2010, Obligation of Operator Who Place Timber and
- Timber Products on the Market
- China RoHS – Administration of the Pollution Control of Electronic Information Products
- Germany Chemicals Prohibition Ordinance (ChemVerbotsV) Japan Industrial Safety and Health Law
- Japan Law on the Regulation of Chemical Substances Joint Industry Guide (JIG), 4th Edition
- Korean packaging waste law Lacey Act; 16 USC 3371-3378
- Montreal Protocol
- Norwegian Product Regulation – Regulated Substances, Preparations and Products
- Nuclear Legislation in OECD and NEA Countries
- Order for the Enforcement of the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture
- Prohibition of Certain Toxic Substances Regulations, 2012 (SOR/2012-285)
- REACH: Regulation (EC) No 1907/2007 of the European Parliament and of the council of 18 December 2006 concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals
- Stockholm Convention on Persistent Organic Pollutants

- Swiss Ordnance 813.11: on Protection against Dangerous Substances and Preparations
- Technical Rules for Hazardous Substances (TRGS) 614 TSCA: US Code of Toxic Substance Control Act of 1976
- U.S. CFR: United States Code of Federal Regulation
- U.S. Consumer Product Safety Improvement Law
- U.S. EPA Clean Air Act
- U.S. EPA Toxic Air Pollutant

ON Semiconductor restricts the intentional use and presence of certain substances, known to be toxic and harmful to the environment, in its manufacturing processes and products. We are providing below a list of these materials, as we are very certain that many of our customers share these concerns:

Table 1: Restricted and Reportable Substances

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
Acrylonitrile	As a monomer in direct and critical indirect materials	Restricted	0[b]	Industry requirement	Table R
Aniline (benzenamine)	Any application	Restricted	0[b]	Canadian Environmental Protection Act 1999, Prohibition of Certain Toxic Substances Regulation 2012	Table AC
Arsenic and its compounds	In any packing material, Paints, melt materials, biocides (including wood treatment), leather and textile finishes, glass, pyrotechnic objects, metal finishes	Restricted	0[b]	EU directive 76/769/EC	Table R
	In any material referenced in table S.	Restricted	1000	Regulation (EC) No 1907/2006 (REACH)	
Antimony and its compounds	Direct and critical indirect materials designated in 'Green' products (i.e., substrates, die attach, bond wire, mold compounds, terminal finish, solder balls, etc)	Restricted	900	ON Semiconductor Green material definition	Table R
	Direct and critical indirect materials Exemption: materials used as doping sources for silicon processes	Reportable	1000	JIG, 4th edition	Table R

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
Asbestos	In any materials	Restricted	0[b]	EU directive 76/769/EC, EU directive 91/339/EEC, US TSCA, Swiss Ordinance 313.11, Germany. Chemicals Prohibition Ordinance. (ChemVerbotsV), Japan Industrial Safety and Health Law	Table G
Azocolourants and azodyes which form certain aromatic amines	Textile, leather any material that contacts the skin.	Restricted	30	EU directive 76/769/EC, EU-D 2002/61/EC, TRGS 614	Table O
1,3-Butadiene	As a monomer in direct and critical indirect materials	Restricted	0[b]	Industry requirement	Table R
Benzene	Direct and critical indirect materials	Restricted	100	Regulation (EC) No 1907/2006 (REACH), EU directive 76/769/EC	Table R
Benzotriazole	Plastics, polymers, laminates, plastic stabilizers, pigments, dyes, paints, inks	Restricted	0[b]	Japan Industrial Safety and Health Law	Table R
Beryllium and its compounds	Direct and critical indirect materials	Reportable	1000	JIG, 4th edition	Table R
Beryllium copper	Direct and critical indirect materials,	Restricted	0[b]	Industry requirement	Table R
Beryllium oxide	Direct and critical indirect materials,	Restricted	0[b]	Industry requirement	Table R
Bismuth		Reportable	1000	JIG, 4th edition	Table R
Bisphenol A	As a monomer in plastics and epoxies	Restricted	50		Table R
Boric Acid	Direct and critical indirect materials	Reportable	1000	Regulation EC No. 790/2009	Table Y
Bromine	Polymer materials designated in 'Green' products (i.e., substrates, die attach, mold compounds, etc) Exemption: Materials not designated as 'Green'	Restricted	900	ON Semiconductor Green material definition, IEC 61249-2-21	Table R
Bromine & Chlorine sum total	Polymer materials designated in 'Green' products (i.e., substrates, die attach, mold compounds, etc) Exemption: Materials not designated as 'Green'	Restricted	1500	ON Semiconductor Green material definition, IEC 61249-2-21	Table M

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
Cadmium and its compounds (see List of RoHS exemptions List of RoHS Exemptions)	Packaging materials	Restricted	5[a]	94/62/EEC, US regulation on Heavy Metals in Packing Materials	Table H
	Plastic parts, plastic stabilizers, pigments, dyes, paints, inks, surface treatments, coatings, plating, fluorescent lamps	Restricted	5	76/769/EEC, 91/338/EEC, 2005/53/EEC (ELV directive), Directive 2011/65/EU (RoHS) directive	
	Solder	Restricted	20		
	All other direct and critical indirect materials	Restricted	50		
Carbon disulfide	Direct and critical indirect materials	Restricted	0[b]	U.S. Clean Air Act	Table R
Chlorine and its compounds	As a monomer in all direct and critical indirect materials	Restricted	0[b]	Industry Requirement	Table T
	Polymer materials designated in 'Green' products (i.e., substrates, die attach, mold compounds, etc) Exemption: Materials not designated as 'Green'	Restricted	900	ON Semiconductor Green material definition, IEC 61249-2-21	Table R
Cobalt dichloride	Direct and critical indirect materials	Restricted	0[b]	Regulation (EC) No 1907/2006 (REACH)	Table R
Dimethyl fumarate	Direct and critical indirect materials	Restricted	0[b]	EU directive 2001/95/EC Regulation (EC) No 1907/2006 (REACH)	Table R
Ethylene glycol ethers	In any material	Restricted	0[b]	US EPA Toxic Air Pollutant	Table N
Expanded Polystyrene (EPS)	Not permitted in packaging in Korea only.	Restricted	≤ 0.04m3	Korean packaging waste law	Table R
Endangered flora and fauna	In any materials	Restricted	0[b]	Lacey Act, U timber regulation	
Formaldehyde	In packaging and materials made of wood	Restricted	0[b]	U.S. TSCA	Table R
Halogenated dioxins and furans	In any material	Restricted	0[b]	Germany. Chemicals Prohibition Ordinance. (ChemVerbotsV).	Table Q
Hexavalent chromium and its compounds (see List of RoHS exemptions List of RoHS Exemptions)	Packaging materials	Restricted	100 [a]	94/62/EEC, US regulation on Heavy Metals in Packing Materials	Table K
Isocyanate	Direct and critical indirect materials	Reportable	1000	Customer requirement	Table R
Lead and its compounds (see List of RoHS exemptions List of	Packaging materials	Restricted	100 [a]	94/62/EEC, US regulation on Heavy Metals in Packing Materials	Table I Table A

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
RoHS Exemptions)	Plastic parts, plastic stabilizers, paints, pigments, dyes, ink	Restricted	50	76/769/EEC, 2005/53/EEC (ELV directive), Directive 2011/65/EU (RoHS), California Proposition 65	
	Surface treatments, coatings		100		
	Solders used for drinking water systems		100		
	Fluorescent lamps		100		
	Non leaded solder, terminal finish (bar, wire, paste, balls)		500		
	All other materials and applications		1000		
Mercury and its compounds (see List of RoHS exemptions List of RoHS Exemptions)	Direct and critical indirect materials	Restricted	0[b]	76/769/EEC, 86/677/EEC, 2005/53/EEC (ELV directive), Directive 2011/65/EU (RoHS), California Proposition 65,	Table D Table A
	Packaging materials	Restricted	100 [a]	94/62/EEC, US regulation on Heavy Metals in Packing Materials	
4-Nitrobiphenyl and its salt	In any material	Restricted	0[b]	U.S Code of Federal Regulation	Table AD
N,N'-ditoly-p-phenylenediamine, N-tolyl-N'-xylyl-p-phenylenediamine, N,N'-dixylyl-p-phenylenediamine	Direct and critical indirect materials	Restricted	0[b]	Order for Enforcement of the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.	Table R
N-Hexane	In any material	Reportable	1000	JIG, 4th edition	Table R
Nano materials	Direct and critical indirect materials	Reportable	Intentionally added	Decree No. 2012-232	Table AA
Nickel and its compounds	Direct and critical indirect materials	Reportable	1000	JIG, 4th edition	Table R
Nonylphenol Nonylphenol ethoxylate	Banned from manufacturing processes	Restricted	0[b]	Regulation (EC) No 1907/2006 (REACH),	Table W
Other Chlorinated organic compounds	Plastics, polymers, laminates and epoxies	Restricted	0[b]	Japanese law regulation of chemical substances, 76/769/EEC	Table T

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
Organostannic (organotin) compounds (DBT, DOT, TBT, TBTO, TPT)	In any material	Restricted	0[b]	Regulation (EC) No 1907/2006 (REACH), Japan law on regulation of Chemical substances	Table P
Ozone depleting substances	All products and materials	Restricted	0[b]	Montreal Protocol, US Clean Air Act, EU EC no.2037/2000, 76/769/EEC	Table A
	Banned from manufacturing processes	Restricted	0		
Perchlorate and its salts	In any material	Restricted	0[b]	U.S. CFR	Table T
Phenol, n-methyl-	As a monomer	Restricted	10	Canadian Environmental Protection Act, 1999	Table W
Perfluorooctane sulfonate (PFOS) and salts (PFAS, PFOA), $C_8F_{17}SO_2X$ (X=OH, metal salts, halides, amides and other derivatives including polymers)	In any material	Restricted	0[b]	76/769/EEC, Canadian Environmental Protection Act 1999, Norwegian Product Regulations	Table Z
Phenol, 2- (2H – benzotriazol-2-yl) – 4,6-bis (1,1-dimethylethyl)	Adhesives, paints, printing inks, inked ribbon, plastic materials, decorative laminate	Restricted	0[b]	Japan's Act on the Evaluation of chemical substances and Regulation of Their Manufacture	Table R
Phthalates	Plastics, polymers, laminates and epoxies	Restricted	0[b]	Regulation (EC) No 1907/2006 (REACH), Danish Executive Order No 1113, U.S. Consumer Product Safety Improvement Law	Table S
Phosphorus – White and Red	Direct and critical indirect materials	Restricted	0[b]	Industry requirement	Table R
Polybrominated biphenyls (PBBs) and their ethers / oxides (PBDEs, PBBOs)	In any material	Restricted	0[b]	2002/95/EC RoHS directive, German law on dioxin, 76/769/EEC, 2003/11/EEC, US law (state) for PentaBDE and Octa BDE	Table L

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
Polychlorinated biphenyls (PCBs), terphenyls (PCTs), and naphthalenes	In any material	Restricted	0[b]	Japanese law regulation of chemical substances, 76/769/EEC, Germany. Chemicals Prohibition Ordinance. (ChemVerbotsV)	Table M
Polycyclic aromatic hydrocarbons (PAHs)	Plastics, synthetic rubber, surface coatings, paint	Restricted	20	Regulation (EC) No 1907/2006 (REACH)	Table X
Polyvinyl chloride (PVC)	Plastics, polymers, laminates and epoxies	Restricted	0[b]	Industry requirement	Table R
POPs-Persistent organic pollutants	In any material	Restricted	0[b]	Stockholm Convention	Table U
Radio Active Substances	Direct and critical indirect materials	Restricted	0[b]	EU-D 96/29 Euratom, Nuclear Legislation in OECD and NEA Countries	Table AB
Rare earth elements	Direct and critical indirect materials	Reportable	0[b]	Industry requirement	Table V
REACH substances of very high concern (SVHC) and Proposed SVHC	Direct and critical indirect materials	Restricted	1000	Regulation (EC) No 1907/2006 (REACH)	Table I
REACH Annex XIV	Direct and critical indirect materials	Restricted	0	Regulation (EC) No 1907/2006 (REACH)	Link to list
REACH Annex XVII	Direct and critical indirect materials	Restricted	0	Regulation (EC) No 1907/2006 (REACH)	Link to list
Selenium and its compounds	Direct and critical indirect materials	Reportable	1000	JIG, 4th edition	Table R
Short chain chlorinated paraffins (C 10-13) & Cl > 50 wt% and Medium chain chlorinated paraffins (C 14-17) & Cl > 50 wt%	In any material	Restricted	0[b]	Regulation (EC) No 1907/2006 (REACH), Norway product regulations,Swiss ordinance 313.11, 76/769/EEC	Table T
Tetrabromobisphenol A (TBBPA)	Direct and critical indirect materials	Restricted	0[b]	Industry requirement	Table R
Toluene	Solvents in paints, coating, inks, adhesives,primers	Restricted	1000	Industry requirement	Table R
Tris (2 Chloroethyl) phosphate (TCEP)	Flame retardant in plastics and resin	Restricted	1000	Regulation (EC) No 1907/2006 (REACH)	Table R

Substance	Controlled Application	Restricted or Reportable	Substance Threshold Limit (ppm)	Legal, Regulatory or Industry Standards Reference	Reference Attachment
a. The sum total of all four metals cannot exceed 100 ppm					
b. Substance threshold limit 0 is defined that intentional use of the substance is prohibited and substance is not detected					

TABLE A

RoHS substances

Substance name	Chemical marking	CAS number	Concentration limit by weight
Lead	Pb	7439-92-1	0.1 %
Cadmium	Cd	7440-43-9	0.01 %
Mercury	Hg	7439-97-6	0.1 %
Hexavalent Chromium	Cr^{6+}	7440-47-3	0.1%
Polybrominated Biphenyls	PBB	67774-32-7	0.1 %
Polybrominated diphenyl ethers	PBDE		0.1 %
Bis(2-ethylhexyl) phthalate	DEHP	117-81-7	0.1 %
Butyl benzyl Phthalate	BBP	85-68-7	0.1 %
Dibutyl phthalate	DBP	84-74-2	0.1 %
Diisobutyl phthalate	DIBP	84-74-2	0.1 %

Applications of above listed RoHS substances exempted by RoHS are allowed.

List of RoHS exemptions can be found at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:174:0088:0110:EN: PDF

Even though, silicon crystal manufacturing operation involves the use of chromic acid in a test process; the final products do not contain Hexavalent Chromium above the RoHS threshold limit.
ON Semiconductor bans the use of lead (Pb) except in the products that are required by the customers. Many applications, e.g. defense etc. allow the use of lead (Pb).

TABLE B

Class I Ozone-depleting substances Group I

CAS No.	Chemical Name
75-69-4	Thrichlorofluoromethane (CFC-11)
75-71-8	Dichlorodifluoromethane (CFC-12)
76-13-1	1,1,2-Trichlorotrifluoroethane (CFC-113)
76-14-2	Dichlorotetrafluoroethane (CFC-114)
76-15-3	Monochloropentafluoroethane (CFC-115)

Class I Ozone-depleting substances Group II

353-59-3	Bromochlorodifluoromethane (Halon 1211)
75-63-8	Bromotrifluoromethane (Halon 1301)
124-73-2	Dibromotetrafluoroethane (Halon 2402)

Class I Ozone-depleting substances Group III

75-72-9	Chlorotrifluoromethane (CFC-13)
354-56-3	Pentachlorofluoroethane (CFC-111)
76-12-0	Tetrachlorodifluoroethane (CFC-112)
422-78-6	Heptachlorofluoropropane (CFC-211)
3182-26-1	Hexachlorodifluoropropane (CFC-212)
2354-06-5	Pentachlorotrifluoropropane (CFC-213)
29255-31-0	Tetrachlorotetrafluoropropane (CFC-214)
4259-43-2	Trichloropenrafluropropane (CFC-215
661-97-2	Dichlorohexafluoropropane (CFC-216)
422-86-6	Chloroheptafluoropropane (CFC-217)

Class I Ozone-depleting substances Group IV

56-23-5	Carbon tetrachloride (CC-14)

Class I Ozone-depleting substances Group V

71-55-6	Methyl Chloroform 1,1,1-Trichloroethane (TCA)

Class I Ozone-depleting substances Group VI

74-83-9	Methyl Bromide

Class I Ozone-depleting substances Group VII

Listed in the Accelerated Phasepout Final Rule	CHFBr2, HBFC-12B1(CHF2Br), CH2FBr, C2HFBr4, C2HF2Br3, C2HF3Br2, C2HF4Br, C2H2FBr3, C2H2F2Br2, C2H2F3Br, C2H3FBr2, C2H3F2Br, C2H4FBr, C3HFBr6, C3HF2Br5, C3HF3Br4, C3HF4Br3, C3HF5Br2, C3HF6Br, C3H2FBr5, C3H2F2Br4, C3H2F3Br3, C3H2F4Br2, C3H2F5Br, C3H3FBr4, C3H3F2Br3, C3H3F3Br2, C3H3F4Br, C3H4FBr3, C3H4F2Br2, C3H4F3Br, C3H5FBr2, C3H5F2Br, C3H6FBr

Class I Ozone-depleting substances Group VIII

74-97-5	Chlorobromomethane

Class II Ozone-depleting substances

CAS No.	Chemical Name
75-43-4	HCFC-21 (CHFCl2) Dichlorofluoromethane
75-45-6	HCFC-22 (CHF2Cl) Monochlorodifluoromethane
593-70-4	HCFC-31 (CH2FCl) Monochlorofluoromethane
354-14-3	HCFC-121 (C2HFCl4) Tetrachlorofluoroethane
354-21-2	HCFC-122 (C2HF2Cl3) Trichlorodifluoroethane
306-83-2	HCFC-123 (C2HF3Cl2) Dichlorotrifluoroethane
2837-89-0	HCFC-124 (C2HF4Cl) Monochlorotetrafluoroethane
359-28-4	HCFC-131 (C2H2FCl3) Trichlorofluoroethane
1649-08-7	HCFC-132b (C2H2F2Cl2) Dichlorodifluoroethane
75-88-7	HCFC-133a (C2H2F3Cl) Monochlorotrifluoroethane
1717-00-6	HCFC-141b (C2H3FCl2) Dichlorofluoroethane
75-68-3	HCFC-142b (C2H3F2Cl) Monochlorodifluoroethane
422-26-4	HCFC-221 (C3HFCl6) Hexachlorofluoropropane
422-49-1	HCFC-222 (C3HF2Cl5) Pentachlorodifluoropropane
422-52-6	HCFC-225ca (C3HF5Cl2) Dichloropentafluoropropane
422-54-8	HCFC-224 (C3HF4Cl3) Trichlorotetrafluoropropane
422-56-0	HCFC-225ca (C3HF5Cl2) Dichloropentafluoropropane
507-55-1	HCFC-225cb (C3HF5Cl2) Dichloropentafluoropropane
431-87-8	HCFC-226 (C3HF6Cl) Monochlorohexafluoropropane
421-94-3	HCFC-231 (C3H2FCl5) Pentachlorofluoropropane
460-89-9	HCFC-232 (C3H2F2Cl4) Tetrachlorodifluoropropane
7125-84-0	HCFC-233 (C3H2F3Cl3) Trichlorotrifluoropropane
425-94-5	HCFC-234 (C3H2F4Cl2) Dichlorotetrafluoropropane
460-92-4	HCFC-235 (C3H2F5Cl) Monochloropentafluoropropane
666-27-3	HCFC-241 (C3H3FCl4) Tetrachlorofluoropropane
460-63-9	HCFC-242 (C3H3F2Cl3) Trichlorodifluoropropane
460-69-5	HCFC-243 (C3H3F3Cl2) Dichlorotrifluoropropane
	HCFC-244 (C3H3F4Cl) Monochlorotetrafluoropropane
421-41-0	HCFC-251 (C3H4FCl3) Monochlorotetrafluoropropane
819-00-1	HCFC-252 (C3H4F2Cl2) Dichlorodifluoropropane
460-35-5	HCFC-253 (C3H4F3Cl) Monochlorotrifluoropropane
420-97-3	HCFC-261 (C3H5FCl2) Dichlorofluoropropane
421-02-03	HCFC-262 (C3H5F2Cl) Monochlorodifluoropropane
430-55-7	HCFC-271 (C3H6FCl) Monochlorofluoropropane

Selected Fluorinated greenhouse gases covered by regulation EC No.517/2014

Substance	Description	Chem.formula	CAS No.
HFC-32	Difluoromethane	CH2F2	75-10-5
HFC-41	Fluoromethane	CH3F	593-53-3
HFC-43-10mee	1,1,1,2,2,3,4,5,5,5-Decafluoropenthane	C5H2F10	138495-42-8
HFC-125	1,1,1,2,2-Pentafluoroethane	C2HF5	354-33-6
HFC-134	1,1,2,2- Tetrafloroethane	C2H2F4	359-35-3
HFC-134a	1,1,1,2-Tetrafluoroethane	C2H2F4	811-97-2
HFC-152a	1,1-Difluoroethane	C2H4F2	75-37-6
HFC-143	1,1,2-Trifluoroethane	C2H3F3	430-66-0
HFC-143a	1,1,1-Trifluoroethane	C2H3F3	420-46-2
HFC-227ea	1,1,1,2,3,3,3-Heptafluoropropane	C3HF7	431-89-0
HFC-236cb	1,1,1,2,2,3-Hexafluoropropane	C3H2F6	677-56-5
HFC-236ea	1,1,1,2,3,3-Hexafluoropropane	C3H2F6	431-63-0
HFC-236fa	1,1,1,3,3,3-Hexafluoropropane	C3H2F6	690-39-1
HFC-245ca	1,1,2,2,3-Pentafluoropropane	C3H3F5	679-86-7
HFC-245fa	1,1,1,3,3-Pentafluoropropane	C3H3F5	460-73-1
HFC-365mfc	1,1,1,3,3-Pentafluorobutane	C4H5F5	406-58-6
Perfluorobutane (PFC-3110)	1,1,1,2,2,3,3,4,4,4-Decaflurobutane	C4F10	355-25-9
Perfluoropentane	1,1,1,2,2,3,3,4,4,5,5,5-Dodecafluoropentane	C5F12	678-26-2
Perfluorohexane (PFC 51-14)	1,1,1,2,2,3,3,4,4,5,5,6,6,6-Tetradecafluorohexane	C6F14	355-42-0
Perfluorocyclobutane	1,1,2,2,3,3,4,4-Octafluorocyclobutane	c-C4F8	115-25-3

ON Semiconductor products do not contain any substance subject to authorization (REACH Annex XIV) and are in compliance with REACH ANNEX XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

ON Semiconductor active products do not contain substances included in the Candidate List of Substances of Very High Concern (SVHC) included till June 2020 with the exception of lead (Pb) and lead oxide (PbO), which are included in the June 2018 SVHC list. In such cases, the lead (Pb) and lead oxide (PbO) are RoHS exempted (see above).

** Diboron trioxide was added to REACH Annex XIV as a Substance of Very High Concern (SVHC) on June 18, 2012. ON Semiconductor products in glass encapsulated packages may list Diboron trioxide as a constituent material in the glass encapsulation, in a concentration greater than 0.1%; REACH classifies; glass as a substance of unknown or variable composition, complex reaction products or biological matter (UVCB) containing the elements silica, calcium, sodium, potassium, magnesium and other cautions bonded together with oxygen. In glass, these elements are bonded into a non-crystalline molecular structure with completely different properties than the starting material; Therefore Diboron trioxide is not present in the finished ON Semiconductor product and does not require notification of the presents of a SVHC.*

TABLE C

Candidate List of Substances of Very High Concern (SVHC) under REACH

https://echa.europa.eu/web/guest/candidate-list-table#download

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	4,4'- Diaminodiphenylmethane (MDA)	202-974-4	101-77-9	10/28/2008
	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	201-329-4	81-15-2	10/28/2008
	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	287-476-5	85535-84-8	10/28/2008
	Anthracene	204-371-1	120-12-7	10/28/2008
	Benzyl butyl phthalate (BBP)	201-622-7	85-68-7	10/28/2008
	Bis (2-ethylhexyl)phthalate (DEHP)	204-211-0	117-81-7	10/28/2008
	Bis(tributyltin)oxide (TBTO)	200-268-0	56-35-9	10/28/2008
	Diarsenic pentaoxide	215-116-9	1303-28-2	10/28/2008
	Diarsenic trioxide	215-481-4	1327-53-3	10/28/2008
	Dibutyl phthalate (DBP)	201-557-4	84-74-2	10/28/2008
	Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified	247-148-4 and 221-695-9	25637-99-4 and 3194-55-6	10/28/2008
Names of the major diastereoisomers identified:	Alpha-hexabromocyclododecane	-	134237-50-6	10/28/2008
	Beta-hexabromocyclododecane		134237-51-7	10/28/2008
	Gamma-hexabromocyclododecane		134237-52-8	10/28/2008
	Lead hydrogen arsenate	232-064-2	7784-40-9	10/28/2008
Sodium dichromate	Sodium dichromate- dihydrate	234-190-3	7789-12-0	10/28/2008
	Sodium dichromate		10588-01-9	10/28/2008

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	Triethyl arsenate	427-700-2	15606-95-8	10/28/2008
	Cobalt dichloride	231-589-4	7646-79-9	10/28/2008
	2,4-Dinitrotoluene	204-450-0	121-14-2	01/13/2010
	Anthracene oil	292-602-7	90640-80-5	01/13/2010
	Anthracene oil, anthracene paste	292-603-2	90640-81-6	01/13/2010
	Anthracene oil, anthracene paste, anthracene fraction	295-275-9	91995-15-2	01/13/2010
	Anthracene oil, anthracene paste,distn. lights	295-278-5	91995-17-4	01/13/2010
	Anthracene oil, anthracene-low	292-604-8	90640-82-7	01/13/2010
	Diisobutyl phthalate	201-553-2	84-69-5	01/13/2010
	Lead chromate	231-846-0	7758-97-6	01/13/2010
	Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	235-759-9	12656-85-8	01/13/2010
	Lead sulfochromate yellow (C.I. Pigment Yellow 34)	215-693-7	1344-37-2	01/13/2010
	Pitch, coal tar, high temp.	266-028-2	65996-93-2	01/13/2010
	Tris(2-chloroethyl)phosphate	204-118-5	115-96-8	01/13/2010
	Acrylamide	201-173-7	79-06-1	03/30/2010
	Ammonium dichromate	232-143-1	7789-09-5	06/18/2010
	Boric acid	234-343-4 (233-139-2)	11113-50-1 (10043-35-3)	06/18/2010
Disodium tetraborate, anhydrous	Disodium tetraborate, decahydrate	215-540-4	1303-96-4	06/18/2010
	Disodium tetraborate, pentahydrate		12179-04-3	
	Disodium tetraborate, anhydrous		1330-43-4	
	Potassium chromate	232-140-5	7789-00-6	06/18/2010
	Potassium dichromate	231-906-6	7778-50-9	06/18/2010
	Sodium chromate	231-889-5	7775-11-3	06/18/2010
	Tetraboron Disodium Heptaoxide, hydrate	235-541-3	12267-73-1	06/18/2010
	Trichloroethylene	201-167-4	79-01-6	06/18/2010
	2-Ethoxyethanol	203-804-1	110-80-5	12/15/2010
	2-Methoxyethanol	203-713-7	109-86-4	12/15/2010
Acids generated from chromium trioxide and their oligomers.	Chromic acid	231-801-5	7738-94-5	12/15/2010
	Dichromic acid	236-881-5	13530-68-2	
	Chromium trioxide	215-607-8	1333-82-0	12/15/2010
	Cobalt(II) carbonate	208-169-4	513-79-1	12/15/2010
	Cobalt(II) diacetate	200-755-8	71-48-7	12/15/2010
	Cobalt(II) dinitrate	233-402-1	10141-05-6	12/15/2010
	Cobalt(II) sulphate	233-334-2	10124-43-3	12/15/2010
	2-Ethoxyethyl acetate	203-839-2	111-15-9	06/20/2011
	Strontium chromate	232-142-6	7789-06-2	06/20/2011
	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	271-084-6	68515-42-4	06/20/2011
	Hydrazine	206-114-9	302-01-2	06/20/2011
	Hydrazine monohydrate		7803-57-8	
	1-Methyl-2-pyrrolidone	212-828-1	872-50-4	06/20/2011
	1,2,3-Trichloropropane	202-486-1	96-18-4	06/20/2011

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	276-158-1	71888-89-6	06/20/2011
Zirconia Aluminosilicate Refractory Ceramic Fibres	a) oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges	**650-017-00-8** in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008	-	12/19/2011
	b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm).		-	
	c) alkaline oxide and alkali earth oxide (Na2O+K2O+CaO+MgO+BaO) content less or equal to 18% by weight		-	
	Calcium arsenate	231-904-5	7778-44-1	12/19/2011
	Bis(2-methoxyethyl) ether	203-924-4	111-96-6	12/19/2011
Aluminosilicate Refractory Ceramic Fibres	a) oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges	**650-017-00-8** in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008	-	12/19/2011
	b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm)		-	
	c) alkaline oxide and alkali earth oxide (Na2O+K2O+CaO+MgO+BaO) content less or equal to 18% by weight		-	
	Potassium hydroxyoctaoxodizincatedichromate	234-329-8	11103-86-9	12/19/2011
	Lead dipicrate	229-335-2	6477-64-1	12/19/2011
	N,N-dimethylacetamide	204-826-4	127-19-5	12/19/2011
	Arsenic acid	231-901-9	7778-39-4	12/19/2011
	2-Methoxyaniline; o-Anisidine	201-963-1	90-04-0	12/19/2011
	Trilead diarsenate	222-979-5	3687-31-8	12/19/2011
	1,2-dichloroethane	203-458-1	107-06-2	12/19/2011
	Pentazinc chromate octahydroxide	256-418-0	49663-84-5	12/19/2011
	4-(1,1,3,3-tetramethylbutyl)phenol	205-426-2	140-66-9	12/19/2011
	Formaldehyde, oligomeric reaction products with aniline	500-036-1	25214-70-4	12/19/2011
	Bis(2-methoxyethyl) phthalate	204-212-6	117-82-8	12/19/2011
	Lead diazide, Lead azide	236-542-1	13424-46-9	12/19/2011
	Lead styphnate	239-290-0	15245-44-0	12/19/2011
	2,2'-dichloro-4,4'-methylenedianiline	202-918-9	101-14-4	12/19/2011
	Phenolphthalein	201-004-7	77-09-8	12/19/2011
	Dichromium tris(chromate)	246-356-2	24613-89-6	12/19/2011
	α,α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4)	229-851-8	6786-83-0	06/18/2012
	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	202-959-2	101-61-1	06/18/2012
	1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5- triazine-2,4,6-(1H,3H,5H)-trione (β-TGIC)	423-400-0	59653-74-6	06/18/2012
	Diboron trioxide	215-125-8	1303-86-2	06/18/2012
	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	203-977-3	112-49-2	06/18/2012
	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	209-218-2	561-41-1	06/18/2012

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	Lead(II) bis(methanesulfonate)	401-750-5	17570-76-2	
	Formamide	200-842-0	75-12-7	06/18/2012
	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1- ylidene]dimethylammonium chloride (C.I. Basic Violet 3) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	208-953-6	548-62-9	06/18/2012
	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	203-794-9	110-71-4	06/18/2012
	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5- dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26) [with ≥ 0.1% of Michler's ketone (EC No. 202-027-5) or Michler's base (EC No. 202-959-2)]	219-943-6	2580-56-5	06/18/2012
	1,3,5-Tris(oxiran-2-ylmethyl)-1,3,5-triazinane- 2,4,6-trione (TGIC)	219-514-3	2451-62-9	06/18/2012
	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	202-027-5	90-94-8	06/18/2012
	Pyrochlore, antimony lead yellow	232-382-1	8012-00-8	12/19/2012
	6-methoxy-m-toluidine (p-cresidine)	204-419-1	120-71-8	12/19/2012
	Henicosafluoroundecanoic acid	218-165-4	2058-94-8	12/19/2012
The individual isomers [2], [3] and [4] (including their cis- and trans- stereo isomeric forms) and all possible combinations of the isomers [1] are covered by this entry	[1] Hexahydromethylphthalic anhydride	247-094-1	25550-51-0	12/19/2012
	[2] Hexahydro-4-methylphthalic anhydride	243-072-0	19438-60-9	
	[3] Hexahydro-1-methylphthalic anhydride	256-356-4	48122-14-1	
	[4] Hexahydro-3-methylphthalic anhydride	260-566-1	57110-29-9	
The individual cis- [2] and trans- [3] isomer substances and all possible combinations of the cis- and trans- isomers [1] are covered by this entry	[1] Cyclohexane-1,2-dicarboxylic anhydride	201-604-9	85-42-7	12/19/2012
	[2] Cis-cyclohexane-1,2-dicarboxylic anhydride	236-086-3	13149-00-3	
	[3] Trans-cyclohexane-1,2-dicarboxylic anhydride	238-009-9	14166-21-3	
	Dibutyltin dichloride (DBTC)	211-670-0	683-18-1	12/19/2012
	Lead bis(tetrafluoroborate)	237-486-0	13814-96-5	12/19/2012
	Lead dinitrate	233-245-9	10099-74-8	12/19/2012
	Silicic acid, lead salt	234-363-3	11120-22-2	12/19/2012
	4-Aminoazobenzene	200-453-6	60-09-3	12/19/2012
	Lead titanium zirconium oxide	235-727-4	12626-81-2	12/19/2012
	Lead monoxide (lead oxide)	215-267-0	1317-36-8	12/19/2012
	o-Toluidine	202-429-0	95-53-4	12/19/2012
	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	421-150-7	143860-04-2	12/19/2012
	Silicic acid ($H_2Si_2O_5$), barium salt (1:1), lead-doped[with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	272-271-5	68784-75-8	12/19/2012
	Trilead bis(carbonate)dihydroxide	215-290-6	1319-46-6	12/19/2012
	Furan	203-727-3	110-00-9	12/19/2012
	N,N-dimethylformamide	200-679-5	68-12-2	12/19/2012
	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering welldefined substances and UVCB substances, polymers and homologues]	-	-	12/19/2012

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	-	-	12/19/2012
	4,4'-methylenedi-o-toluidine	212-658-8	838-88-0	12/19/2012
	Diethyl sulphate	200-589-6	64-67-5	12/19/2012
	Dimethyl sulphate	201-058-1	77-78-1	12/19/2012
	Lead oxide sulfate	234-853-7	12036-76-9	12/19/2012
	Lead titanium trioxide	235-038-9	12060-00-3	12/19/2012
	Acetic acid, lead salt, basic	257-175-3	51404-69-4	12/19/2012
	[Phthalato(2-)]dioxotrilead	273-688-5	69011-06-9	12/19/2012
	Bis(pentabromophenyl) ether [DecaBDE]	214-604-9	1163-19-5	12/19/2012
	N-methylacetamide	201-182-6	79-16-3	12/19/2012
	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	201-861-7	88-85-7	12/19/2012
	1,2-Diethoxyethane	211-076-1	629-14-1	12/19/2012
	Tetralead trioxide sulphate	235-380-9	12202-17-4	12/19/2012
	N-pentyl-isopentylphthalate	-	776297-69-9	12/19/2012
	Dioxobis(stearato)trilead	235-702-8	12578-12-0	12/19/2012
	Tetraethyllead	201-075-4	78-00-2	12/19/2012
	Pentalead tetraoxide sulphate	235-067-7	12065-90-6	12/19/2012
	Pentacosafluorotridecanoic acid	276-745-2	72629-94-8	12/19/2012
	Tricosafluorododecanoic acid	206-203-2	307-55-1	12/19/2012
	Heptacosafluorotetradecanoic acid	206-803-4	376-06-7	12/19/2012
	1-bromopropane (n-propyl bromide)	203-445-0	106-94-5	12/19/2012
	Methoxyacetic acid	210-894-6	625-45-6	12/19/2012
	4-methyl-m-phenylenediamine (toluene-2,4- diamine)	202-453-1	95-80-7	12/19/2012
	Methyloxirane (Propylene oxide)	200-879-2	75-56-9	12/19/2012
	Trilead dioxide phosphonate	235-252-2	12141-20-7	12/19/2012
	o-aminoazotoluene	202-591-2	97-56-3	12/19/2012
	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	284-032-2	84777-06-0	12/19/2012
	4,4'-oxydianiline and its salts	202-977-0	101-80-4	12/19/2012
	Orange lead (lead tetroxide)	215-235-6	1314-41-6	12/19/2012
	Biphenyl-4-ylamine	202-177-1	92-67-1	12/19/2012
	Diisopentylphthalate	210-088-4	605-50-5	12/19/2012
	Fatty acids, C16-18, lead salts	292-966-7	91031-62-8	12/19/2012
	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	204-650-8	123-77-3	12/19/2012
	Sulfurous acid, lead salt, dibasic	263-467-1	62229-08-7	12/19/2012
	Lead cyanamidate	244-073-9	20837-86-9	12/19/2012
	Cadmium	231-152-8	7440-43-9	06/20/2013
	Ammonium pentadecafluorooctanoate (APFO)	223-320-4	3825-26-1	06/20/2013
	Pentadecafluorooctanoic acid (PFOA)	206-397-9	335-67-1	06/20/2013
	Dipentyl phthalate (DPP)	205-017-9	131-18-0	06/20/2013
	Cadmium oxide	215-146-2	1306-19-0	06/20/2013
	Cadmium sulphide	215-147-8	1306-23-6	12/16/2013

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	217-710-3	1937-37-7	12/16/2013
	Dihexyl phthalate	201-559-5	84-75-3	12/16/2013
	Imidazolidine-2-thione; (2-imidazoline-2-thiol)	202-506-9	96-45-7	12/16/2013
	Trixylyl phosphate	246-677-8	25155-23-1	12/16/2013
	Disodium 3,3'-[[1,1'-biphenyl]-4,4'- diylbis(azo)]bis(4-aminonaphthalene-1- sulphonate) (C.I. Direct Red 28)	209-358-4	573-58-0	12/16/2013
	Lead di(acetate)	206-104-4	301-04-2	12/16/2013
	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	271-093-5	68515-50-4	06/16/2014
	Sodium perborate; perboric acid, sodium salt	239-172-9	-	06/16/2014
		234-390-0		
	Sodium peroxometaborate	231-556-4	7632-04-4	06/16/2014
	Cadmium chloride	233-296-7	10108-64-2	06/16/2014
	Cadmium Sulphate	233-331-6	10124-36-4	12/17/2014
			31119-53-6	
	Cadmium fluoride	232-222-0	7790-79-6	12/17/2014
	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	247-384-8	25973-55-1	12/17/2014
	Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	-	-	12/17/2014
	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5- dithia-4-stannatetradecanoate (DOTE)	239-622-4	15571-58-1	12/17/2014
	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV- 320)	223-346-6	3846-71-7	12/17/2014
	Bis(2-ethylhexyl) phthalate (DEHP) as a substance of very high concern because of its endocrine disrupting properties which cause probable serious effects to human health and the environment which give rise to an equivalent level of concern to those of cmr1 and pbt/vpvb2 substances adopted	204-211-0	117-81-7	12/17/2014
	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate (EC No. 201-559-5)	271-094-0	68515-51-5	06/15/2015
		272-013-1	68648-93-1	
	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5- methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6- dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any comb. thof]	-	-	06/15/2015
	1,3-propanesultone	214-317-9	1120-71-4	12/17/2015
	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2- yl)phenol (UV-327)	223-383-8	3864-99-1	12/17/2015
	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol (UV-350	253-037-1	36437-37-3	12/17/2015
	Nitrobenzene	202-716-0	98-95-3	12/17/2015
	Perfluorononan-1-oic-acid and its sodium and ammonium salts	206-801-3	375-95-1	12/17/2015
			21049-39-8	
			4149-60-4	
	Benzo[def]chrysene (Benzo[a]pyrene)	200-028-5	50-32-8	06/20/2016
	p-(1,1-dimethylpropyl)phenol	201-280-9	80-46-6	01/12/2017

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	Nonadecafluorodecanoic acid	206-400-3	335-76-2	01/12/2017
	Decanoic acid, nonadecafluoro-, sodium salt	-	3830-45-3	01/12/2017
	Ammonium nonadecafluorodecanoate	221-470-5	3108-42-7	01/12/2017
	4-Heptylphenol, branched and linear substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof	-	-	01/12/2017
	4,4'-isopropylidenediphenol	201-245-8	80-05-7	01/12/2017
	Perfluorohexane-1-sulphonic acid and its salts	-	-	07/07/2017
	Benz[a]anthracene	200-280-6	56-55-3	01/15/2018
			1718-53-2	
	Cadmium carbonate	208-168-9	513-78-0	01/15/2018
	Cadmium hydroxide	244-168-5	21041-95-2	01/15/2018
	Cadmium nitrate	233-710-6	10022-68-1	01/15/2018
			10325-94-7	
	Chrysene	205-923-4	218-01-9	01/15/2018
			1719-03-5	
	Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10] octadeca-7,15-diene (“Dechlorane Plus”™) covering any of its individual anti- and syn- isomers or any combination thereof	236-948-9	13560-89-9	01/15/2018
		-	135821-74-8	
		-	135821-03-3	
	Reaction products of 1,3,4-thiadiazolidine-2,5- dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) with ≥0.1% w/w 4-heptylphenol, branched and linear	-	-	01/15/2018
	Terphenyl, hydrogenated	262-967-7	61788-32-7	06/27/2018
	Octamethylcyclotetrasiloxane	209-136-7	556-67-2	06/27/2018
	Lead**	231-100-4	7439-92-1	06/27/2018
	Ethylenediamine EDA	203-468-6	107-15-3	06/27/2018
	Dodecamethylcyclohexasiloxane D6	208-762-8	540-97-6	06/27/2018
	Disodium octaborate	234-541-0	12008-41-2	06/27/2018
	Dicyclohexyl phthalate DCHP	201-545-9	84-61-7	06/27/2018
	Decamethylcyclopentasiloxane D5	208-764-9	541-02-6	06/27/2018
	Benzo[ghi]perylene	205-883-8	191-24-2	06/27/2018
	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride trimellitic anhydride; TMA	209-008-0	552-30-7	06/27/2018
	2,2-bis(4'-hydroxyphenyl)-4-methylpentane (Bisphenol P)	401-720-1	6807-17-6	01/15/2019
	Benzo[k]fluoranthene	205-916-6	207-08-9	01/15/2019
	Fluoranthene	205-912-4	206-44-0	01/15/2019
	Phenanthrene	201-581-5	85-01-8	01/15/2019
	Pyrene	204-927-3	129-00-0	01/15/2019
	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one	239-139-9	15087-24-8	01/15/2019

Substance group	Substance name	EC No.	CAS No.	Date of Inclusion
	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ≥ 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	-	-	07/16/2019
	4-tert-butylphenol	202-679-0	98-54-4	07/16/2019
	2-methoxyethyl acetate	203-772-9	110-49-6	07/16/2019
	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides covering any of their individual isomers and combinations thereof	-	-	07/16/2019
	Perfluorobutane sulfonic acid (PFBS) and its salts			01/16/2020
	Diisohexyl phthalate	276-090-2	71850-09-4	01/16/2020
	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	400-600-6	71868-10-5	01/16/2020
	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	404-360-3	119313-12-1	01/16/2020
	Dibutylbis(pentane-2,4-dionato-O,O')tin	245-152-0	22673-19-4	06/25/2020
	butyl 4-hydroxybenzoate	202-318-7	94-26-8	06/25/2020
	2-methylimidazole	211-765-7	693-98-1	06/25/2020
	1-vinylimidazole	214-012-0	1072-63-5	06/25/2020

TABLE D

Other substances

Chemical Name	CAS No.
2-ethoxy ethanol (Ethylene Glycol Monoethyl Ether Acetate)	110-80-5
2-ethoxyethyl acetate (Ethylene Glycol Monoethyl Ether)	111-15-9
2-methoxy ethanol (Ethylene Glycol Monomethyl Ether)	109-86-4
2-methoxyethyl acetate (Ethylene Glycol Methyl Ether Acetate)	110-49-6
Formaldehyde	50-00-0
Benzene	71-43-2
Cadmium	7440-43-9
Amosite (Asbestos)	12172-73-5
Chrysotile (Asbestos)	12001-29-5
Crocidolite (Asbestos)	12001-28-4
Anthophyllite	17068-78-9
Tremolite	14567-73-8
Actinolite	13768-60-8
Trichloroethylene (TCE)	79-01-6
Tetrachloroethylene (Perchloroethylene)	127-18-4
Ethyl ether (allowed for lab use only)	60-29-7
Hydrazine	302-01-2
Sodium azide	26628-22-8
Picric Acid	88-89-1
Perchloric Acid	7601-90-3

Chemical Name	CAS No.
Polychlorinated naphthalenes	
Polychlorinated biphenyls (PCB)	
Methyl Bromide	74-83-9
Chlorinated paraffins	
TBTO	56-35-9
TBBP-A-Bis	21850-44-2
Mirex	2385-85-5
Cadmium compounds	
Mercury (except for use of articles)	7439-97-6
Mercury compounds	
Pentabromodiphenyl ether	32534-81-9
Octobromodiphenyl ether	32536-52-0
Decabromodiphenyl ether	1163-19-5
Polyvinyl Chloride and Polyvinyl Chloride blends	9002-86-2
Polychlorinated Terphenyls (PCTs)	61788-33-8
Tri-substituted organostannic compounds	
Azocolourants and azodyes which form certain aromatic amines	
Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1- dimethylethyl)	3846-71-7
Dimethyl fumarate	624-49-7
Dibutyltin (DBT) compounds	
Dioctyltin (DOT) compounds	
Brominated Dioxins/Furans	
Chlorinated Dioxins / Furans	
Perchlorates	
Perfluorooctane sulfonate (PFOS)	
Selected Phtalates Group 2 (DIDP,DINP,DNOP)	
Selected Phtalates Group3 (DMEP, DNHP)	
Radiocative Substances	
Beryllium >1000 ppm	7440-41-7
n-Hexane	110-54-3

The ON Semiconductor EHS Department may add to this list if the use of a proposed chemical is expected to pose an unreasonable risk.

Packaging Materials

This specification establishes requirements on packaging materials (including reporting) for ON Semiconductor products, parts and assemblies including those supplied by subcontractors. It is largely based on European Union Directive 94/62/EC (Article 11) and all amendments (2004/12/EC).
In addition, it includes the reporting requirements for substances of very high concern (SVHC's) candidates as they are referred to in the REACH Regulation in the European Union. Articles, including packaging, that contain >0.1% by weight of an SVHC candidate are subject to communication requirements and may be subject to notification requirements under REACH.

Terms and Definitions

Packaging: All goods made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of products from the producer to the customer or the consumer.
Packaging Components – Packaging materials which can be easily separated by hand or by simple mechanical means.

Requirements

5.1. No packaging component or packaging sub component used for ON Semiconductor products shall contain lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium (Cr6), or as a part of its final composition in excess of a sum concentration level of 100ppm (0.01%) by weight. https://eur- lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01994L0062- 20150526&from=EN
Packaging materials have to be certified only at the time of first brought into company. Annual update of 3rd party test reports is not required for packaging materials.

5.2. Do not use halogenated (including brominated) flame retardants in packaging materials. Examples include PBB (Polybrominated biphenyl), PBDE (Polybrominated diphenyl ether), or TBBPA (Tetrabromobisphenol A).

5.3. The substances shown in REACH Annex XVII Restricted Substances are prohibited. Refer to link for full listing, uses and allowances as defined by ECHA. https://echa.europa.eu/substances-restricted-under-reach

5.4. The substances shown in Authorisation List are now prohibited from use in packaging materials in amounts greater than 0.1% w/w of the article. For the official list and related requirements refer to the ECHA website: https://echa.europa.eu/authorisation-list

5.5. Packaging components that contain more than 0.1% by weight (>1000ppm) of any of the substances of REACH Substances of Very High

Concern (SVHC) Candidates list are subject to communications requirements, and in some cases to notification requirements under REACH. All packaging components that contain more than 0.1% by weight of any of these substances must be reported to ON Semiconductor procurement.

6.0 Restricted Substance Requirements for Suppliers, including Assembly Subcontractors, Foundries, Direct Materials and Shipping Material suppliers.

Direct material suppliers, wafer foundries and assembly subcontractors to ON Semiconductor must ensure that all materials used in part manufacture and in facility operations satisfy all applicable environmental, health and safety government regulations and directives, including European Union Directive on the Restrictions on use of certain Hazardous Substances (RoHS), on restricted, toxic and hazardous materials. Suppliers must be prepared to provide supporting evidence of conformance.

Product supplied to ON Semiconductor, including recycled materials, must not be processed with or intentionally contain any of the restricted materials listed in this brochure.

6.1 Requirements for a third party analytical test report for RoHS and halogen-free compliance.

ON Semiconductor and our customers require our suppliers to comply with RoHS (Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment) requirements. The RoHS Directive 2011/65/EU restricts the use of certain hazardous substances.

6.2 ROHS substance testing and a report requirement:
(For homogeneous materials to be tested on RoHS restricted substances see Table E)

1. Suppliers are required to use an ISO 17025 certified, or equivalent, third party laboratory that is well versed with ROHS compliance and testing protocols to have the samples of materials analyzed annually.
2. For a list of substances, that must be analyzed, reference Table E.
3. Analytical testing of materials must be done with material in the “cured” state.
4. The test method IEC 62321 must be used for all ROHS substances.
5. For test on Beryllium the required test methods are US EPA 3050B and US EPA 3052.
6. Test results must meet ROHS maximum concentration values (MCVs) specified in Directive 2011/65/EU.
7. Materials need to be tested in the same compositional state as its presence in the final product. Wet materials must be dried or cured to simulate the state in the finished product since regulated substance concentration may change from wet to dry.
8. The report must contain a picture of the specimen tested
9. The test will be repeated annually and a new report will be submitted to ON Semiconductor

6.3 Suppliers claiming "halogen-free" materials must provide an analytical test report that will meet the following standards and conditions (For die attach, solder pastes, mold compounds, substrates, solder mask and polyimide materials):

1. Suppliers must use ISO 17025 certified, or equivalent, third party laboratory, that is well versed with "halogen-free" compliance and testing protocols.
2. Analytical testing of materials must be done with material in the "cured" state.
3. Materials must be analyzed for total chlorine, total bromine and antimony compounds
4. Ion Chromatograph using a common test method like EN 14582 must be used. The chosen method must capture all chlorine and bromine, regardless of whether it is organic or inorganic etc.
5. Test results must show total chlorine and total bromine below 900 ppm levels each and not exceeding 1500 ppm total.
6. Test results must show total antimony trioxide concentration below 1000 ppm level
7. The report must contain a picture of the specimen tested.
8. The test will be repeated annually and a recent test report will be submitted to ON Semiconductor
9. Report must be in English.

6.4. Foundries and subcontractors
supplying their finished product to ON Semiconductor must provide an annual analytical test report per requirements state above.

It is responsibility of ON Semiconductor suppliers, to provide the name(s) and email contact(s) information of the person(s) who will be responsible to provide the analytical test reports.

If you require additional information, please contact your local Supply Management representative.

The supplier must retain all analytical test reports for 10 years after product end of life.

TABLE E

	RoHs Directive 2011/65/EU restricted substances										Halogen Free restricted substances			Other requirements
Substance	Cadmium	Lead	Mercury	Hexavalent Chromium	Polybrominated biphenyls	Polybrominted diphenyl ethers	Bis (2-ethylhexyl) phthalate	Butyl benzyl phthalate	Dibutyl phthalate	Diisobutyl phthalate	Halogen Chlorine	Halogen Bromine	Antimony Trioxide	Beryllium
Chemical Formula	Cd	Pb	Hg	CrVI	PBB	PBDE	DEHP	BBP	DBP	DIBP	Cl	Br	Sb_2O_3	Be
Homogeneous material to be tested														
Leadframe	O	O	O	O	O	O	O	O	O	O				O
Die attach/ Epoxy	O	O	O	O	O	O	O	O	O	O	O	O	O	
Plating anodes	O	O	O	O	O	O	O	O	O	O				O
Wire bond	O	O	O	O	O	O	O	O	O	O				O
Solder clips	O	O	O	O	O	O	O	O	O	O				O
Solder paste	O	O	O	O	O	O	O	O	O	O	O	O	O	
Solder Wire	O	O	O	O	O	O	O	O	O	O				O
Solder balls	O	O	O	O	O	O	O	O	O	O				O
Substrates	O	O	O	O	O	O	O	O	O	O	O	O	O	
Heat sink/ spreader	O	O	O	O	O	O	O	O	O	O				O
Mold compound	O	O	O	O	O	O	O	O	O	O	O	O	O	
Soldermask	O	O	O	O	O	O	O	O	O	O	O	O	O	
Polyimide/PI Tape	O	O	O	O	O	O	O	O	O	O	O	O	O	
Coating	O	O	O	O	O	O	O	O	O	O	O	O	O	
RDL/UBM metals	O	O	O	O	O	O	O	O	O	O				O
Passive components	O	O	O	O	O	O	O	O	O	O	O	O	O	O
RoHS requirement	<100 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<1000 ppm	<900 ppm	<900 ppm	<1000 ppm	
Other requirements	< 50 ppm*	< 50 ppm **		<500 ppm***										<1000 ppm****

***Pigment stabilizer, copper alloys; reference GB/T 26572**

****Plastics (i.e. polymeric) materials cable jackets and insulation, paints, inks, non-metallic and non-ceramis coatings e.g. stabilizer, pigment, drying agent ; reference IEEE 1680.1-2009, CSPSIA**

*****Metal coating, pigment; reference GB/T 26572**

******Metals and ceramic materials in connectors, stiffeners,AC inlets, springs, EMI finger/spring, transceivers, brackets,housing, buttons, speaker wire, beryllia ceramic, copperberyllium alloys**

Tab.E Overview of Requirement for a Third Party (SGS Lab) Test Report for ROHS and “Halogen-free” Compliance

Attachment 1 - Other Detailed Chemical Lists with CAS Numbers (Not Exhaustive)

Table G – Asbestos and its Compounds

Substance	CAS numbers
Asbestos and Asbestos Materials	1332-21-4, 132207-33-1, 132207-32-0
Actinolite	77536-66-4, 13768-00-8
Amosite (Grunerite)	12172-73-5
Anthophyllite	77536-67-5, 17068-78-9
Chrysotile	12001-29-5
Crocidolite	12001-28-4
Tremolite	77536-68-6, 14567-73-8

Table H – Cadmium and its Compounds

Substance	CAS numbers
Cadmium	7440- 43- 9
Cadmium oxide	1306- 19- 0
Cadmium sulfide	1306- 23- 6
Cadmium Chloride	10108-64-2
Cadmium Nitrate	10325-94-7
Cadmium nitrate tetrahydrate	10022-68-1
Cadmium sulfate	10124-36-4
Cadmium stearate	2223-93-0
Other cadmium compounds	

Table I – Lead and its Compounds

Substance	CAS Numbers	Substance	CAS Numbers
Calcium plumbate	12013-69-3	Lead chromate: chrome yellow	1344-37-2
Lead	7439- 92- 1	Lead fluoroborate	13814-96-5
lead (II) acetate	546-67-8	Lead flurosilicate	25808-74-6
Lead (II) acetate, trihydrate	6080- 56- 4	Lead hydrocarbonate	1319-46-6
Lead (II) arsenate	10031-13-7	Lead hydroxycarbonate	1344-36-1
Lead (II) cyanide	595-05-2	Lead metasilicate	11120-22-2 22569-74-0
Lead (II) fluoride	7783-46-2	Lead molybdate	10190-55-3
Lead (II) iodide	10101-63-0	Lead nitrate	10099-74-8
Lead (II) metaborate	10214-39-8	Lead oleate	1120-46-3
Lead (II) oxide	1317-356-8	Lead oxide sulfate	12202-17-4
Lead (II) phosphate	7446-27-2	Lead perchlorate	13637-76-8
Lead (II) sulfate	7446-14-2 15739-80-7	Lead phosphate	7446- 27- 7
Lead (II) sulfide	1314-87-0	Lead selenide	12069-00-0
Lead (IV) chloride: lead tetrachloride	13463-30-4	Lead stearate	7428-48-0
Lead (IV) oxide	1309-60-0	Lead sulfate	7446- 14- 2
Lead / Tin alloy	39412-44-7	Lead thiocyanate	592-87-0
Lead acetate	301- 04- 2	Tetraethyl lead	78-00-2
Lead antimonite	122666-38-5; 13150-89-9	Tetramethyl lead	75-74-1
Lead arsenate (1:1)	7784-40-9	Trilead tetraoxide: lead (II,IV) oxide	1314-41-6
Lead azide	13424-46-9	Other lead compounds	
Lead carbonate	598-63-0		

Table J – Mercury and its Compounds

Substance	CAS Numbers
Mercury	7439- 97- 6
Mercuric sulfate	7783- 35- 9
Mercuric nitrate	10045- 94- 0
Mercuric oxide	21908- 53- 2
Other mercury compounds	

Table K – Chromium VI and its Compounds

Substance	CAS Numbers
Chromium (Cr6+)	7440- 47- 3
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
Other Chromium VI compounds	

Table L – Polybrominated Biphenyls (PBBs) and their Ethers and Oxides

Substance	CAS numbers
Bromobiphenyl and its ethers	101-55-3 (ether)
	2052-07-5 (2-Bromobiphenyl)
	2113-57-7 (3-Bromobiphenyl)
	92-66-0 (4-Bromobiphenyl)
Decabromobiphenyl and its ethers	1163-19-5 (ether)
	13654-09-6
Dibromobiphenyl and its ethers	2050-47-7 (ether)
	92-86-4 , 77102-82-0 (3,3^{I} ,4,4^{I},-bromodiphenyl), 67888-96-4 (2,2^{I} ,4,5^{I}-bromodiphenyl)
Heptabromobiphenylether	68928-80-3
Hexabromobiphenyl and its ethers	36355-01-8 (hexabromo-1,1'- biphenyl)
	36483-60-0 (ether)
	59080-40-9
	67774-32-7 (Firemaster FF-1)
	25637-99-4, 3194-55-6
Nonabromobiphenylether	63936-56-1
Octabromobiphenyl and its ethers	32536-52-0 (ether)
	61288-13-9
Pentabromobidphenyl ether (PeBDPO)	32534-81-9
Polybrominated biphenyl; polybromobiphenyl; PBB	67774-32-7
Polybrominated Biphenyls	59536-65-1
Tetrabromobiphenyl and its ethers	40088-45-7
	40088-47-9 (ether)
Tetrabromobisphenol-A-bis-(2,3-bibromoproplyether)	21850-44-2
Tribromobiphenyl	64258-03-3
Tribromobiphenyl ether	49690-94-0

Table M – Polychlorinated Biphenyls (PCBs), Terphenyls (PCTs) and Phthalenes

Substance	CAS numbers
Polychlorinated Biphenyls	1336-36-3
Aroclor	12767-79-2
Chlorodiphenyl (Aroclor 1260)	11096-82-5bb
Kanechlor 500	27323-18-8
Aroclor 1254	11097-69-1
Monomethyl tetrachloro diphenyl methane (Ugilec 141)	76253-60-6
Monomethyl dichloro diphenyl methane (Ugilec 121 and Ugilec 21)	81161-70-8
Monomethyldibromodiphenylmethane	99688-47-8

Substance	CAS numbers
Polychlorninated terphenyle (PCTs) (All isomers and homologs)	61788-33-8
Terphenyls	26140-60-3
polycholorinated naphthalene (more than 3 chlorine atoms)	70776-03-3
Trichloronaphthalene	1321-65-9
Tetrachloronaphthalene	1335-88-2
Pentachloronaphthalene	1321-64-8
Octachloronaphthalene	2234-13-1

Table N – Certain Ethylene Glycol Ethers

Substance	CAS numbers
2-Ethoxyethanol (EGEE)	110-80-5
2-Ethoxyethyl acetate (EGEEA)	111-15-9
2-Methoxyethanol (EGME)	109-86-4
2-Methoxyethyl acetate (EGMEA)	110-49-6
Diethylene glycol dimethyl ether (DiGlyME)	111-96-6

Table O – Amines that are created during decomposition of Azo compounds

Substance	CAS numbers
2, 4, 5-trimethylaniline	137-17-7
2, 4-diaminoanisole	615-05-4
2, 4-tolluylenediamine	95-80-7
2-amino-4-nitrotoluene	99-55-8
2-naphthylamine	91-59-8
3, 3'-dichlorobenzidine	91-94-1
3, 3'-dimethoxybenzidine	119-90-4
3, 3'-dimethyl-4, 4'-diaminodiphenylmethane	838-88-0
3, 3'-dimethylbenzidine	119-93-7
3, 3'-dimethyl-4,4'-diaminodiphenylmethane	838-88-0
4, 4'-diaminodiphenylmethane	101-77-9
4, 4'-methylene-bis-(2-chloro aniline)	101-14-4
4, 4'-oxideaniline	101-80-4
4, 4'-thiodianiline	139-65-1
4-aminoazobenzene	60-09-3
4-amonodiphenyl	92-67-1
4-chloro-o-toluidine	95-69-2
Benzidine	92-87-5
o-aminoazotoluene	97-56-3
o-anisidine	90-04-0
o-toluidine	95-53-4
p-chloroaniline	106-47-8
p-cresidine	120-71-8

Table P – Organostannic (organotin) Compounds

Substance	CAS numbers
Dibutyltin Oxide	818-08-6
Dibutyltin diacetate	1067-33-0
Dibutyltin dilaurate	77-58-7
Dibutyltin maleate	78-04-06
Dioctyltin oxide	870-08-6
Dioctyltin dilaurate	3648-18-8
Tributyltin bromide	1461-23-0
Bis(Tributyltin) oxide (TBTO)	56-35-9
Tributyltin acetate	56-36-0
Tributyltin laurate	3090-36-6
Tributyltin fluoride	1983-10-4
Triphenyltin	668-34-8
Triphenyltin chloride	639-58-7
Triphenyltin hydroxide	76-87-9
Triphenyltin acetate	900-95-8
Triphenyltin fluoride	379-52-2
Triphenyltin fluoride (fentin fluoride)	1803-12-9
Triphenyltin fluoride (fentin fluoride)	18380-71-7
Triphenyltin chloroacetate	7094-94-2
Tributyltin methacrylate	2155-70-6
Trioctyltine chloride	2587-76-0
Trimethyltin hydroxide	994-32-1
Trimethyltin chloride	994-31-0
Bis (tributyl tin) fumarate	6454-35-9
Bis (tributly tin) 2, 3-dibromosuccinate	31732-71-5

Table Q – Halogenated Dioxins and Furans

Substance	CAS numbers
2,3,7,8-Tetra-CDD	1746-01-6
1,2,3,7,8-Penta-CDD	40321-76-4
2,3,7,8-Tetra-CDF	51207-31-9
2,3,4,7,8-Penta-CDF	57117-31-4
1,2,3,4,7,8-Hexa-CDD	39227-28-6
1,2,3,7,8,9-Hexa-CDD	19408-74-3
1,2,3,6,7,8-Hexa-CDD	57653-85-7
1,2,3,7,8-Penta-CDF	57117-41-6
1,2,3,4,7,8-Hexa-CDF	70648-26-9
1,2,3,7,8,9-Hexa_CDF	72918-21-9
1,2,3,6,7,8-Hexa-CDF	57117-44-9
2,3,4,6,7,8-Hexa-CDF	60851-34-5
1,2,3,4,6,7,8-Hepta-CDD	35822-46-9
1,2,3,4,6,7,8,9-Octa-CDD	3268-87-9
1,2,3,4,6,7,8-Hepta-CDF	67562-39-4
1,2,3,4,7,8,9-Hepta-CDF	55673-89-7
1,2,3,4,6,7,8,9-Octa-CDF	39001-02-0
2,3,7,8-Tetra-BDD	50585-81-6
1,2,3,7,8-Penta-BDD	109333-34-8
2,3,7,8-Tetra-BDF	67733-57-7
2,3,4,7,8-Penta-BDF	131166-92-2
1,2,3,4,7,8-Hexa-BDD	110999-44-5
1,2,3,7,8,9-Hexa-BDD	110999-46-7
1,2,3,6,7,8-Hexa-BDD	110999-45-6
1,2,3,7,8-Penta-BDF	109333-34-8

Table R – Other Substances

Substance	CAS numbers
Acrylonitrile	107-13-1
Antimony	7440-36-0
Antimony trioxide	1309-64-4
Antimony pentoxide	1314-60-9
Arsenic and its compounds	7440-38-2 and several
Benzene	71-43-2
Benzotriazole	95-14-7
Beryllium	7440-41-7
Beryllium copper	11133-98-5
Beryllium oxide	1304-56-9
Bismuth	7440-69-9
Bisphenol A	80-05-7
Bromine	7726-95-6
1,3-Butadiene	106-99-0
Carbon disulfide	75-15-0
Cobalt dichloride	7646-79-9
Chlorine	7782-50-5
Cyclododecane	294-62-2
Dimethyl fumarate	624-49-7
Expanded Polystyrene (EPS)	9003-53-6
Formaldehyde	50-00-0
Hexabromocyclododecane	25637-99-4, 3194-55-6
Isocyanate	75-13-8
N-hexane	110-54-3
N,N'-ditoly-p-phenylenediamine	27417-40-9
N-tolyl-N'-xylyl-p-phenylenediamine	28726-30-9
N,N'-dixylyl-p-phenylenediamine	70290-05-0
Nickel and its compounds	8049-31-8
Phenol, 2- (2H - benzotriazol-2-yl) - 4,6-bis (1,1-dimethylethyl)	3846-71-7
Polyvinyl chloride	9002-86-2
Red phosphorus	7723-14-0
Selenium	7782-49-2
Tetrabromobisphenol A (TBBP)	79-94-7
Toluene	108-88-3
Tris (2 Chloroethyl) phosphate (TCEP)	115-96-8
White phosphorus	12185-10-3
Yellow Phosphorus	7723-14-0

Table S - Phthalates

Substance	CAS numbers
Bis(2-Ethylhexyl) Phthalate (DEHP)	117-81-7
Bis (2-methoxyethyl) phthalate (DMEP)	117-82-8
Dibutyl Phthalate (DBP)	84-74-2, 201-557-4
Benzyl Butyl Phthalate (BBP)	85-68-7
Dicyclohexyl phthalate	84-61-7
Diethyl phthalate (DEP)	84-66-2
Dimethyl phthalate (DMP)	113-11-3
Diisobutyl Phthalate (DIBP)	84-69-5
Diisononyl phthalate (DINP)	28553-12-0, 68515-48-0
Di-n-isodecyl phthalate (DIDP)	26761-40-0, 68515-49-1
Di-n-hexyl phthalate (DnHP)	84-75-3
Di-n-octyl phthalate (DNOP)	117-84-0
1,2 Benzenedicaboxylic acid, di-C6-8 branched alkyl esters, C7-rich	71888-89-6
1,2 Benzenedicaboxylic acid, di-C7-11 branched and linear alkyl esters	68515-42-4
BIs(2-methoxyethyl) phthalate	605-50-5
1,2 Benzenedicaboxylic acid, dipentylester, branched and linear	84777-06-0
N-pentyl-isopentylphthalate	776297-69-9
Dipentyl phthalate	131-18-0
Bis(2-ethylhexyl)tetrabromophthalate	26040-51-7

Table T – Other Chlorinated Compounds

Substance	CAS numbers
1,2-dichloroethane; ethylene dichloride; ethylene chloride; EDC; Ethane dichloride	107-06-2
1,1-dichloroethylene; vinyldiene chloride	75-35-4
1,2-dichloroethylene; Acetylene dichloride	540-59-0
1,1,1,2 Tetrachloroethane	630-20-6
1,1,2,2 Tetrachloroethane	79-34-5
1,1,1-trichloroethane (TCA)	79-00-5
1,1,2-trichloroethane	79-00-5
Bis (chloromethyl) ether	542-88-1
Dichloromethane; methylene chloride	79-02-2
Chloroform; trichloromethene; methyl trichloride	67-66-3
Epichlorohydrin (monomer)	106-89-8
Methylenechloride	75-09-2
Trichloroethylene	79-01-6
Tetrachloroethyleve	127-18-4
Pentachloroethane	76-01-7
Pentachlorophenol (PCP)	87-86-5
Perclorate	1497-73-0
Ammonium perchlorate	7790-98-9
Lithium perchlorate	7791-03-9
Magnesium perchlorate	10034-81-8
Potassium perchlorate	7778-74-7
Sodium perchlorate	7601-89-0
Polychloronated Phenols and their salts	Chemical class; no CAS numbers assigned
Sodium salt other PCP salts and compounds	131-52-2
Hexabromocyclododecane (HBCDD)	3194-55-6
Hexachlorocyclohexane	319-84-6
Hexachlorobutadiene	87-68-3
Short chain chlorinated paraffins (C 10-13) & Cl $\geq$ 50 w t% and Medium chain chlorinated paraffins (C 14-17) & Cl > 50 w t%	108171-26-2, 61788-76-9, 63449-39-8, 71011-12-6, 85535-84-8, 85535-85-9
Vinyl Chloride (monmer)	75-01-4

Table U: Persistent Organic Pollutants

Substance	CAS numbers
Aldrin	309-22-0
Chlordane	57-74-9
Dichlorodipheyl trichloroethane	50-29-3
Dieldrin	60-57-1
Endrin	72-20-8
Endosulfan	115-29-7, 959-98-8, 33213-65-9
Heptachlor	1024-57-3
Hexachlorobenzene	118-74-1
Mirex (Perchlorodecone)	2385-85-5
Pentachlorobenzene	603-93-5
Toxaphene	8001-35-2

Table V – Rare Earth Elements

Substance	Symbol	CAS number
Scandium	Sc	7440-20-2
Yttrium	Y	7440-65-5
Lanthanum	La	7439-91-0
Cerium	Ce	7440-45-1
Praseodymium	Pr	7440-10-0
Neodymium	Nd	7440-00-8
Promethium	Pm	7440-12-2
Samarium	Sm	7440-19-9
Europium	Eu	7440-53-1
Gadolinium	Gd	7440-54-2
Terbium	Tb	7440-27-9
Dysprosium	Dy	7429-91-6
Holmium	Ho	7440-60-0
Erbium	Er	7440-52-0
Thulium	Tm	7440-30-4
Ytterbium	Yb	7440-64-4
Lutetium	Lu	7439-94-3

Table W - Phenol, n-methyl; Nonylphenol and Ethoxylate

Substance	CAS numbers
Phenol, methyl	95-48-7
Phenol, 2-methyl	106-44-5
Phenol, 3-methyl	108-39-4
Phenol, 4-methyl	1319-77-3
Nonylphenol	104-40-5 *
n-Nonylphenol (mixed isomers)	25154-52-3*
Nonylphenol, industrial	84852-15-3*
Phenol, dinonyl	1323-65-5
Phenol, nonyl-,phosphitea	26523-78-4
Phenol, nonyl-, barium salt	28987-17-9
Phenol, nonyl derivatives	68081-86-7
Barium, carbonate nonylphenol complexes	68515-89-9
Phenol, nonyl derives., sulphides	68515-93-5
2-(p-Nonylphenoxy) ethanol	104-35-8 *
2-(2-(p-Nonylphenoxy)ethoxy) ethanol	20427-84-3*
p-Nonylphenol polyethylene glycol ether	26027-38-3*
Nonylphenol hepta(oxyethylene)ethanol	27177-05-5*
Nonylphenol nona(oxyethylene)ethanol	27177-08-8*
Ethoxynonyl-benzene	28679-13-2*
onylphenoxy ethanol	27986-36-3*
Oxirane, methyl-, polymer with oxirane, mono(nonylphenyl) ether	37251-69-7*
2-(2-(2-(2-(p-Nonylphenoxy)et hoxy) ethoxy)ethoxy) ethanol	7311-27-5*
Nonylphenol polyethylene glycol ether	9016-45-9*
Ethanol, 2-[2-(nonylphenoxy)ethoxy]-	27176-93-8
Nonylphenol ethoxylate	37340-60-6
Poly(oxy-1,2-ethanediyl), alpha-(nonylphenyl)-omega-hydroxy-, phosphate	51811-79-1
Poly(oxy-1,2-ethanediyl), alpha-(2-nonylphenyl)-om ega-hydroxy-	51938-25-1
Nonylphenol ethoxylate	68412-53-3
Ammonium salt of sulphated nonylphenol ethoxylate	9051-57-4

Substance	CAS numbers
Poly(oxy-1,2-ethanediyl), alpha(isononylphenyl) omega-hydroxy	37205-87-1
Poly(oxy-1,2-ethanediyl), alpha(nonylphenyl) omega-hydroxy, branched	68412-54-4
Poly(oxy-1,2-ethanediyl), alpha(4-nonylphenyl) omega-hydroxy, branched	127087-87-01

Table X - Polycyclic Aromatic Hydrocarbons (PAH)

Substance	CAS number
3-Methylcholanthrene,	56-49-5
5-Methylchrysene,	3697-24-3
7,12-Dimethylbenz(a)anthracene,	57-97-6
7H-Dibenzo(c,g)carbazole,	194-59-2
Acenaphthene	83-32-9
Acenaphthylene	208-96-8
Anthracene	120-12-7
Benz(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(b)fluoranthene Benz[e]acephenanthrylene	205-99-2
Benzo(e)pyrene	192-97-2
Benzo(ghi)-perylene	191-42-2
Benzo(j)fluoranthene	205-82-3
Benzo(k)fluoranthene	207-08-2
Benzo(r,s,t)pentaphene,	189-55-9
Chrysene	218-01-9
Dibenz(a,h)acridine,	226-36-8
Dibenz(a,j)acridine,	224-42-0
Dibenzo(a,e)fluoranthene,	5385-75-1
Dibenzo(a,e)pyrene,	192-65-4
Dibenzo(a,h)-anthracene	53-70-3
Dibenzo(a,h)pyrene,	189-64-0
Dibenzo(a,l)pyrene,	191-30-0
Fluoranthene	206-44-0
Fluorene	86-73-7
Indeno[1,2,3-cd]pyrene	193-39-5
Naphthalene	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0

Table Y – Boric Acid and Sodium Borates

Substance	CAS number
Boric acid	10043-35-3
Boric acid	11113-50-1
Tetraboron disodium heptaoxide pentahydrate	12179-04-3
Tetraboron disodium heptaoxide	1330-43-4
Disodium tetraborate decahydrate	1303-96-4
Tetraboron disodium heptaoxide, hydrate	12267-73-1

Table Z – Perfluorooctane Sulfonate (PFOS) & Perfluorooctanoic acid (PFOA)

Substance	CAS number
Heptadecafluorooctane-1-sulphonic acid	1763-23-1,
Perfluorooctane sulfonate fluoride	307-35-7
Lithium heptadecafluorooctanesulphonate	29457-72-5
Potassium heptadecafluorooctane-1-sulphonate	2795-39-3
Perfluorooctanic acid (PFOA)	335-67-1
Ammonium pentadecafluorooctanoate (APOF)	3825-26-1
Sodium salt of perfluorooctanoic acid	335-95-5
Potassium salt of perfluorooctanoic acid	2395-00-8
Silver (1+) salt of perfluorooctanoic acid	335-93-3
Perfluorooctanoyl fluoride	335-66-0
Methyl perfluorooctanoate	376-27-2
Ethyl perfluorooctanoate	3108-24-5

Table AA – Nanomaterials (Nanoparticles)

Substance	CAS number
Copper(I) oxide (Cu2O) nanoparticles	1317-39-1
Carbon nanofibres	7782-42-5
Carbon nanotubes (CNTs)	308068-56-6
Fullerene nanoparticles	131159-39-2
Fluorographene (fluorinated graphene) nanoparticles	N/A
Indium oxide nanoparticles	1312-43-2
Jordisite (MoS2) nanoparticles	12068-92-7
Melonite (NiTe2) nanoparticles	12035-58-4
Molybdenum disulfide (MoS2) nanoparticles	1309-56-4
Molybdenum telluride (MoTe2) nanoparticles	12058-20-7
Molybdenum(IV) sulfide (MoS2) nanoparticles	1317-33-5
Nanoclay	1302-78-9
Nanoclays modified w / organic salts such as tetra-alkylammonium salt	N/A
Nano diamond	7782-40-3
Nanotubes, nano diamond, nano silver	N/A
Nickel(II) oxide(NiO) nanoparticles	1313-99-1
Rutile (TiO2) nanoparticles	1317-80-2
Silicon dioxide nanoparticles	7631-86-9
Silver nanow ires	N/A
Tantalum sulfide (TaS2) nanoparticles	12143-72-5
Tungsten sulfide (WS2) nanoparticles	12138-09-9
Tungstenite (WS2) nanoparticles	12067-21-9
Yttrium Oxide (Y2O3) nanoparticles	1314-36-9
Zinc Oxide (ZnO) nanoparticles	N/A
Zincite (ZnO) nanoparticles	20431-17-8

Table AB – Radioactive Substances / Isotopes

Substance	CAS number
Uranium – 238	7440-61-6
Radon	10043-92-2
Americium – 241	14596-10-2
Thorium – 232	7440-29-1
Cesium – 137	10045-97-3
Strontium -90	10098-97-2

Table AC – Aniline (Benzenamine)

Substance	CAS number
Benzenamine, 4-octyl-N-(4-octylphenyl)	101-67-7
Benzenamine, 4-octyl-N-pheny	4175-37-5
Benzenamine, 4-(1-methyl-1-phenylethyl)-N-[4-(1-methyl-1-phenylethyl)phenyl]	10081-67-1
Benzenamine, 4-(1,1,3,3-tetramethylbutyl)-N-[4-(1,1,3,3-tetramethylbutyl)phenyl]	15721-78-5
Benzenamine, 4-nonyl-N-(4-nonylphenyl)	24928-59-5
Benzenamine, ar-octyl-N-(octylphenyl)	26603-23-6
Benzenamine, ar-nonyl-N-phenyl	27177-41-9
Benzenamine, ar-nonyl-N-(nonylphenyl)	36878-20-3
Benzenamine, N-phenyl-, reaction products w ith 2,4,4-trimethylpentene	68411-46-1
Benenamine, N-phenyl-, Reaction Products w ith Styrene and 2,4,4-Trimethylpentene) BNST	68921-45-9

Table AD - 4-Nitrobiphenyl and its Salt

Substance	CAS number
2-Acetylaminofluorene	53-96-3
4-Aminodiphenyl	92-67-1
Benzidine (and its salts)	92-87-5
3,3'-Dichlorobenzidine(and its salts)	612-83-9
4-Dimethylaminoazobenzene	60-11-7
1-Naphthylamine	134-32-7
2-Naphthylamine	91-59-8
4-Nitrobiphenyl	92-93-3
N-Nitrosodimethylamine	62-75-9
2-Oxetanone	57-57-8
bis-Chloromethyl ether	542-88-1
Methyl chloromethyl ether	107-30-2
Ethyleneimine	151-56-4

REVISION HISTORY

Revision	Change Originator	Description of Revision and Reason	Change Analyst	Effective Date
O	Ajay Shah	Initial release of Product Chemical Content Brochure via Agile, Document Repository.	E. Rivas	13 Apr 2009
A	Kazuhiko Katase	Delete the part of SGS submission due date. Per ECO-NBOI-011743	A. Saw	23 Sep 2009
B	Kazuhiko Katase	Add BRD8022/D for Web reference. Update the date. Per ECO-NBOI-016011	A.Saw	12 Apr 2010
C	Kazuhiko Katase	Add Ceramic package. Per ECO-NBOI-017309	A.Saw	19 May 2010
D	Kazuhiko Katase	Add REACH requirement. Per ECO-NBOI-017638	A.Saw	03 Jun 2010
E	Kazuhiko Katase	Add REACH New element, and Update supplier letter to include substrate and other polyimide compound testing for HF and Antimony compounds analyses Add SGS test requirement matrix. Per ECO-NBOI-019379	A.Saw	28 Jul 2010
F	Kazuhiko Katase	Add SGS report retention requirement. Per ECO-NBOI-019824	A.Saw	20 Aug 2010
G	Kazuhiko Katase	Add REACH 9 New elements. Per ECO-NBOI-024015	A.Saw	14 Mar 2011
H	Ajay Shah	Updated Environmentally Restricted Substances table under page 5. Requested by Ajay Shah per ECO-NBOI-030199.	J. Tandoc	16 Dec 2011
J	Kazuhiko Katase	Add REACH requirement and update the list per ECO-NBOI-032098.	M. Altergott	28 Mar 2012
K	Kazuhiko Katase	Updated Environmentally Restricted Substances table per ECO-NBOI-039585.	M. Altergott	13 Feb 2013
L	Kazuhiko Katase	Updated Environmentally Restricted Substances table, added 6 new SVHC substances Updated ONRC address in Take-Back and Recycle Policy chapter Font changes, Updated RoHS2 statement. Updates per ECO-NBOI-046791 by Pam Amorin	E. Rivas	20 Aug 2013
M	Jozef Vavro	Updated Environmentally Restricted Substances, Added 7 new SVHC substances. Request submitted by Zuzana Dovicicova per ECO-NBOI-055525.	J. Tandoc	27 Feb 2014
N	Jozef Vavro	Updated Environmentally Restricted Substances, Added 4 new SVHC substances Request submitted by Zuzana Dovicicova per ECO-NBOI-065820	L. Patagan	07 July 2014
P	Jozef Vavro	Updated Environmentally Restricted Substances. Added n-Hexane Request submitted by Zuzana Dovicicova per ECO-NBOI-070154	L. Patagan	11 Sept 2014

Revision	Change Originator	Description of Revision and Reason	Change Analyst	Effective Date
R	Jozef Vavro	Updated Environmentally Restricted Substances, Added 7 new SVHC substances. Added 5 Packaging materials. Updated 4.Silicon Chip Updated text in Environmentally restricted substance on page 8 Added "…above RoHS threshold limit." On page 19 Request submitted by Zuzana Dovicicova per ECO-NBOI-077644 DDCM Admin Changed. Transfer Revision History Table from page 2 to last page of the document.	L. Patagan	19 Jan 2015
S	Jozef Vavro	Updated Environmentally Restricted Substances, Added 2 new SVHC substances Deleted Note Request submitted by Zuzana Dovicicova per ECO-NBOI-089759	L. Patagan	28 July 2015
T	Kazuhiko Katase	Update RoHS test table in page 21 with Customer (Stringer) requirement. Change to "Suppliers should use a SGS laboratory" in page 19 Request submitted by Kazuhiko Katase per ECO-NBOI-097804	L. Patagan	18 Nov 2015
U	Jozef Vavro	Updated table RoHS substances on page 6 – added 4 phthalates according to 2015/863/EU. Updated list of REACH SVHC substances – added 5 new substances according to ECHA list issued on 17.Dec. 2015 Update RoHS test table in page 21 with new RoHS testing requirements. Request submitted by Jozef Vavro per ECO-NBOI-100972	L. Patagan	24 Jan 2016
V	Jozef Vavro	Updated list of REACH SVHC substances – added 1 new substance according to ECHA list issued on 20th June. 2016. Added Table "Restrictions to manufacturing processes used to create components or materials for Apple products " Request submitted by Jozef Vavro per ECO-NBOI-113441	L. Patagan	13 Jul 2016
W	Jozef Vavro	Updated list of REACH SVHC substances – added 4 new substances according to ECHA list issued on 12th January. 2017. Request submitted by Jozef Vavro per ECO-NBOI-127635	L. Patagan	26 Feb 2017
Y	Jozef Vavro	Deleted substance Nr.161, added substance Nr.173 into the list of REACH SVHC substance, Table renumbered. Added tables G-AD Whole document restructured. Request submitted by Jozef Vavro per ECO-NBOI-144518	L. Patagan	04 Sept 2017
Z	Jozef Vavro	Updated Table C "Substances of Very High Concern under REACH". Added substances included in the ECHA list on 15 January, 2018. Updated chapter Packaging materials par. 5.1 Updated Table F in the Requirements for the third party test reports for RoHS and Halogen free compliance ECO-NBOI-174484	L. Patagan	06 Jun 2018

Revision	Change Originator	Description of Revision and Reason	Change Analyst	Effective Date
AA	Jolene Small	Updated Table C “Substances of Very High Concern under REACH”. Updated the substances included in the ECHA list as of 15 January, 2019. Added requirement that analytical testing of materials must be done with material in the “cured” state. ECO-NBOI-202432	L. Patagan	14 Mar 2019
AB	Jozef Vavro	Updated Table C “Substances of Very High Concern under REACH”. Updated the substances included in the ECHA list as of 16 July, 2019. Updated 6.1, 6.2, 6.3, 6.4 ECO-NBOI-219729	L. Patagan	08 Aug 2019
AC	Jozef Vavro	Updated Table C “Substances of Very High Concern under REACH”. Added 4 new substances of very high concern (SVHC) included in the ECHA list as of 16 January, 2020. Updated font of date for some items. Into 6.2 inserted: 5. For tests on Beryllium required test methods are US EPA 3050B and US EPA 3052. 6.2 Changed : (For homogeneous materials to be tested on RoHS restricted substances see Table E), instead of previously listed materials. 6.2.Changed order of other points. Updated Table E. ECO-NBOI-242923	L. Patagan	23 Mar 2020
AD	Rastislav Drska	Text replacing **from** “ON Semiconductor active products do not contain any of the Substances of Very High Concern (SVHC) included till July 2019” **to** “ON Semiconductor active products do not contain substances included in the Candidate List of Substances of Very High Concern (SVHC) included till June 2020” (page 16) Updated Table C renamed from “Substances of Very High Concern under REACH” to more “Candidate List of Substances of Very High Concern (SVHC) under REACH. Added 4 new substances included in the ECHA list as of 25 June, 2020. “Selected Fluorinated greenhouse gases covered by regulation EC No.842/2006” (not valid) replaced by new EC No.517/2014 ECO-NBOI-255372	L. Patagan	29 July 2020