



Banned Lists of Chemicals

Cradle to Cradle Certified^{CM} Product Standard **Version 3.0**



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Banned Lists of Chemicals

These following lists contain those chemicals and substances that are banned for use in Cradle to Cradle Certified^{CM} products as **intentional inputs above 1000 ppm**. These substances were selected for inclusion on the Banned Lists due to their tendency to accumulate in the biosphere and lead to irreversible negative human health effects. In addition, several substances were selected due to hazardous characteristics associated with their manufacture, use, and disposal.

The intention for the “Banned Lists” is not to simply provide a checklist to eliminate chemicals of concern. Rather, it should be viewed as specific examples that may also be used to guide substitution. There may be chemicals similar in structure that are not on the list but exhibit similar properties to the listed chemical. Thoughtful substitutions using the intentional design approach of Cradle to Cradle would suggest that chemicals with similar properties would not be a good substitution choice.

There are two lists provided: a banned list of chemicals for technical nutrients and a banned list of chemicals for biological nutrients. A key component of Cradle to Cradle® design is the recognition of and design for the two nested cycles – biological and technical. Banned Lists were thus created separately for biological and technological nutrients to allow for the use of some substances like lead or cadmium in materials where exposure to humans or the environment is highly unlikely to occur. Lead, for example, is often used in cast aluminum, from which it does not migrate out of the material and can therefore be managed in safe technical cycles. However, lead should not be used in biological nutrients, which ultimately cycle into the biosphere. On the other hand, mercury is not suitable for either type of nutrient cycles due its ability to easily migrate out of materials. The overall intention is to inspire and promote innovation in quality products in a way that supports 10 billion people on earth without increasing the natural background level of materials or harming people or the environment.

Note that lead, PTFE, and polycyclic aromatic hydrocarbons (PAHs) are substances that are on the Biological Nutrients Banned List but not the Technical Nutrients Banned List. While these substances can be used in some materials as technical nutrients, where exposure is not expected to occur (e.g., lead in aluminum, PAHs in carbon black), they are harmful chemicals and should not be present in materials that may result in exposure to humans and the environment. Therefore, despite not being present on the Technical Nutrient Banned List (with the exception of cadmium), lead, cadmium, PTFE, and PAHs are banned for use in materials where exposure to humans or the environment is highly likely to occur. Examples of these materials include paints, coatings, and finishes that are used on the surface of products such as toys or other children’s products and jewelry. Relevant material use scenarios will be determined and evaluated by the assessor. Note also that PTFE is banned in Technical Nutrients if it is the primary component of the product or material.



Banned List of Chemicals for Technical Nutrients

SUBSTANCE	CAS #	COMMENTS
Metals		
Arsenic	7440-38-2	
Cadmium	7440-43-9	Banned only for products with no guaranteed nutrient management.
Chromium VI	18540-29-9	
Mercury	7439-97-6	
Flame Retardants		
Hexabromocyclododecane	3194-55-6;	
Penta-BDE	32534-81-9	
Octa-BDE	32536-52-0	
Deca-BDE	1163-19-5	
Polybrominated Diphenyl Ethers (PBDEs)	Several	
Tetrabromobisphenol A	79-94-7	
Tris(1,3-dichloro-2-propyl)phosphate	13674-87-8	
Phthalates		
Bis(2-ethylhexyl)phthalate	117-81-7	
Butyl benzyl phthalate	85-68-7	
Dibutyl phthalate	84-74-2	
Halogenated Polymers		
Polyvinyl chloride (PVC)	9002-86-2	
Polyvinylidenechloride (PVDC)	9002-85-1	
Chlorinated polyvinyl chloride (CPVC)	68648-82-8	
Polychloroprene	9010-98-4	
Chlorinated Hydrocarbons		



Overview of the Cradle to Cradle Certified^{CM} Product Standard – Version 3.0

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SUBSTANCE	CAS #	COMMENTS
1,2-Dichlorobenzene	95-50-1	
1,3-Dichlorobenzene	541-73-1	
1,4-Dichlorobenzene	106-46-7	
1,2,4-Trichlorobenzene	120-82-1	
1,2,4,5-Tetrachlorobenzene	95-94-3	
Pentachlorobenzene	608-93-5	
Hexachlorobenzene	118-74-1	
PCB and Ugilec	Several	
Short-chain chlorinated paraffins	Several	
OTHERS		
Pentachlorophenol	87-86-5	
Nonylphenol	104-40-5, 84852-15-3	
Octylphenol	27193-28-8	
Nonylphenol ethoxylates	Several	
Octylphenol ethoxylates	Several	
Tributyltin	688-73-3	
Trioctyltin	869-59-0	
Triphenyltin	892-20-6	
Perfluorooctane sulfonic acid	1763-23-1	
Perfluorooctanoic acid	335-67-1	



Banned List of Chemicals for Biological Nutrients

SUBSTANCE	CAS #	COMMENTS
Metals		
Arsenic	7440-38-2	Restricted to maximum background concentration in soils
Chromium VI	18540-29-9	
Mercury	7439-97-6	
Cadmium	7440-43-9	
Lead*	7439-92-1	
Flame Retardants		
Hexabromocyclododecane	3194-55-6;	
Penta-BDE	32534-81-9	
Octa-BDE	32536-52-0	
Deca-BDE	1163-19-5	
Polybrominated Diphenyl Ethers (PBDEs)	Several	
Tetrabromobisphenol A	79-94-7	
Tris(1,3-dichloro-2-propyl)phosphate	13674-87-8	
Phthalates		
Bis(2-ethylhexyl)phthalate	117-81-7	
Butyl benzyl phthalate	85-68-7	
Dibutyl phthalate	84-74-2	
Halogenated Polymers		
Polyvinyl chloride (PVC)	9002-86-2	
Polyvinylidenechloride (PVDC)	9002-85-1	
Chlorinated polyvinyl chloride (CPVC)	68648-82-8	
Polychloroprene	9010-98-4	
Polytetrafluoroethylene (PTFE)*	9002-84-0	



SUBSTANCE	CAS #	COMMENTS
Chlorinated Hydrocarbons		
1,2-Dichlorobenzene	95-50-1	
1,3-Dichlorobenzene	541-73-1	
1,4-Dichlorobenzene	106-46-7	
1,2,4-Trichlorobenzene	120-82-1	
1,2,4,5-Tetrachlorobenzene	95-94-3	
Pentachlorobenzene	608-93-5	
Hexachlorobenzene	118-74-1	
PCB and Ugilec	Several	
Short-chain chlorinated paraffins	Several	
Other		
Pentachlorophenol	87-86-5	
Nonylphenol	104-40-5, 84852-15-3	
Octylphenol	27193-28-8	
Nonylphenol ethoxylates	Several	
Octylphenol ethoxylates	Several	
Tributyltin	688-73-3	
Trioctyltin	869-59-0	
Triphenyltin	892-20-6	
Perfluorooctane sulfonic acid	1763-23-1	
Perfluorooctanoic acid	335-67-1	
Polycyclic Aromatic Hydrocarbons*		
PAH group (as defined in TRI)	Not applicable	
Benzo(a)pyrene	50-32-8	
5-Methylchrysene	3697-24-3	
Acenaphthene	83-32-9	



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SUBSTANCE	CAS #	COMMENTS
Anthracene	120-12-7	
Benz(a)anthracene	56-55-3	
Benz(j)aceanthrylene	202-33-5	
Benzo(b)fluoranthene	205-99-2	
Benzo(c)phenanthrene	195-19-7	
Benzo(g,h,l)perylene	191-24-2	
Benzo(j)fluoranthene	205-82-3	
Benzo(k)fluoranthrene	207-08-9	
Chrysene	218-01-9	
Cyclopenta(c,d)pyrene	27208-37-3	
Dibenzo(a,h)anthracene	53-70-3	
Dibenzo(a,h)pyrene	189-64-0	
Dibenzo(a,i)pyrene	189-55-9	
Dibenzo(a,l)pyrene	191-30-0	
Fluoranthene	206-44-0	
Fluorene	86-73-7	
Indeno(1,2,3,c,d)pyrene	193-39-5	
Naphthalene	91-20-3	
Phenanthrene	85-01-8	
Pyrene	129-00-0	

* Note these chemicals are on the Banned List for Biological Nutrients only