

BCPP Red List Technical Guidance

Last updated May 2020

Unless otherwise noted below, the chemicals on the Red List should not be used in personal care products, cleaning products or in fragrance. Some of the chemicals, however, can be used with restrictions. Some are also potential contaminants of intentionally added ingredients. These contaminants are detailed below, with information about testing recommendations.

Aloe Vera

CAS # 85507-69-3

Aloe Vera leaf extract is a possible carcinogen according to IARC. This refers specifically to whole leaf extract, which includes the aloe vera gel, leaf pulp (the layer just inside the green rind), and the latex which runs through tubes in the leaf pulp. These studies only assessed oral ingestion; and no studies have looked at skin absorption. <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono108-01.pdf>. Aloe Vera should not be used in products that are ingested but can otherwise be used.

Antimony

CAS # 7440-36-0

Short-term effects in humans include irritation of the eyes and lungs and can cause heart and lung problems and a variety of other adverse health effects. Animal studies have shown increased incidence of lung cancer in rats that breathed high levels of antimony. We recommend testing finished products with a limit of detection of 5 ppm or better.

Arsenic

CAS # 7440-38-2

Arsenic is listed as carcinogenic to humans by IARC and the NTP. We recommend testing finished products with a limit of detection of 1 ppm or better. We recommend that companies using colorants source from suppliers who can certify it is not contaminated by heavy metals.

Benzophenone

CAS # 119-61-9

Benzophenone is persistent, bioaccumulative and toxic (PBT). It is linked to endocrine disruption and organ system toxicity, and listed as a possible human carcinogen by California's Proposition 65. To comply with the red list, manufacturers should not intentionally add benzophenone as an ingredient; we recommend titanium dioxide or zinc oxide as mineral-based UV filters in non-inhalable forms.

Cadmium

CAS # 7440-43-9

Cadmium is listed as carcinogenic to humans by IARC and the NTP. California's Proposition 65 lists cadmium as a known carcinogen and reproductive toxicant. We recommend testing finished products with a limit of detection of 2 ppm or better.

Chromium VI Oxide

CAS # 1333-82-0

Chromium VI carcinogenic to humans. It is also linked to immune and respiratory toxicity, as well as systemic toxicity. We recommend testing finished products with a limit of detection of 2 ppm or better.

Dimethicone

CAS # 56-18-8

The red-listed chemical bis-aminopropyl dimethicone specifically. This does not include all dimethicones. This chemical is listed due to potential eye and skin irritation, so should be listed on all product labels and web materials.

Ethylhexyl glycerin

CAS # 70445-33-9

Ethylhexylglycerin polysilicone-11 appears on our Red List due to concerns around eye irritation and aquatic toxicity (at concentrations above 1.5 ppm). Care should be taken in products that are rinsed off.

Ethoxylated Ingredients

(1,4-dioxane CAS # 123-91-1 and Ethylene Oxide CAS #75-21-8)

1,4-dioxane and ethylene oxide are listed as known or suspected to cause cancer or birth defects by California's Proposition 65 program. Due to contamination concerns for 1,4-dioxane and ethylene oxide, we strongly encourage companies to avoid these ethoxylated ingredients, PEGs, -eths (such as compounds with steareth, laureth, cetareth, and ceteth in the name) and polysorbates. If they are used, companies should work with suppliers to avoid and/or strip out 1,4 dioxane and ethylene oxide contamination.

Fragrance

Fragrance ingredients can include chemicals linked to endocrine disruption, cancer and cell function. Without full disclosure by fragrance suppliers to manufacturers and from manufacturers to consumers, consumers cannot make informed purchasing decisions. Companies should fully disclose fragrance ingredients. "Fragrance," "fragrance/parfum," "natural fragrance," or "organic fragrance" should not be listed on labels without identifying constituents.

Glycerin

CAS # 56-81-5

Glycerin appears on the Red List due to potential skin and eye irritation, so should be listed on all product labels and web materials.

Heavy Metals

Metals have been linked to reproductive, immune, and nervous system toxicity by NIOSH, OSHA, and California's Prop 65. They are common contaminants in many natural and synthetic colorants, as well as ingredients mined from the earth. We recommend that companies using colorants source from suppliers who can certify they are not contaminated by heavy metals. Potential contaminants (listed individually in this guidance) include: antimony, arsenic, cadmium, chromium VI, lead, mercury and nickel.

Homosalate

CAS # 118-56-9

Homosalate, oxybenzone, and octinoxate are endocrine disruptors, and should be avoided in sunscreens, foundations and other UV-protective products. We recommend titanium dioxide or zinc oxide as mineral-based UV filters in non-inhalable forms.

Lead

CAS # 7439-92-1

Lead is listed as possibly carcinogenic to humans by IARC. Lead is a well-known and proven neurotoxin that has been linked to learning, language and behavioral problems. We recommend testing finished products with a limit of detection of 2 ppm or better.

Mercury

CAS # 7439-97-6

Mercury is linked to nervous system toxicity, as well as reproductive, immune and respiratory toxicity, and is a recognized environmental health concern by numerous national and international government bodies. FDA requires that mercury levels are less than 1 ppm in the finished product. We recommend testing finished products with a limit of detection of .01 ppm.

Methyl Methacrylate

CAS # 80-62-6

In the early 1970s, methyl methacrylate was the primary monomer, or molecule, used in acrylic nails. In response to consumer complaints of severe nail and skin reactions, the U.S. Food and Drug Administration concluded it was a "poisonous and deleterious substance" and decided to seize and recall nail products containing 100

percent liquid methyl methacrylate in 1974. Companies should not use methyl methacrylate (at any concentration) in acrylic nails.

Nickel

CAS # 7440-02-0

Nickel is listed as possibly carcinogenic to humans by IARC, and a reasonably anticipated to be human carcinogen by the NTP. Nickel has also been linked to have estrogenic effects on human breast cancer cells.

Octinoxate

CAS # 5466-77-3

Homosalate, oxybenzone, and octinoxate are endocrine disruptors, and should be avoided in sunscreens, foundations and other UV-protective products. We recommend titanium dioxide or zinc oxide as mineral-based UV filters in non-inhalable forms.

Oxybenzone

CAS # 131-57-7

Homosalate, oxybenzone, and octinoxate are endocrine disruptors, and should be avoided in sunscreens, foundations and other UV-protective products. We recommend titanium dioxide or zinc oxide as mineral-based UV filters in non-inhalable forms.

Polyacrylamide

CAS # 79-06-1

Polyacrylamide contains small amounts of unreacted acrylamide. The International Agency for Research on Cancer lists acrylamide as probably carcinogenic to humans. The National Toxicology Program designates acrylamide as a reasonably anticipated to be human carcinogen. We recommend that limits are set for the amount of residual acrylamide allowed in products containing polyacrylamide.

P-Phenylenediamine

CAS # 106-50-3

Consumers encounter p-phenylenediamine in many forms of permanent hair dyes called oxidative dyes. As a known skin sensitizer, it leads to allergic reactions. P-phenylenediamine, as well as the products of its reactions with hydrogen, can alter the genetic material of cells. It is of biggest concern for salon workers who encounter it repeatedly. Companies should reformulate to avoid the use of p-phenylenediamine in hair dyes.

Polytetrafluoroethylene (PTFE) and other Perfluorinated compounds

CAS # 9002-84-0

Polytetrafluoroethylene (PTFE) has potential contamination concerns with perfluorooctanoic acid (PFOA) which is a possible carcinogen, and associated with reproductive toxicity, endocrine disruption, and environmental bioaccumulation and persistence. We recommend that companies using a polytetrafluoroethylene source from suppliers who can certify it is not contaminated by perfluorooctanoic acid or other harmful perfluorinated compounds.

Retinyl Palmitate

CAS # 79-81-2

Retinyl Palmitate is listed as a developmental toxicant by California's Proposition 65 program. It may increase skin cancer risk. It should not be included in any products.

Sodium Bicarbonate (Baking Soda)

CAS # 144-55-8

Sodium bicarbonate is on our Red List because it is on the TEDX list of potential endocrine disruptors, based upon a study of direct administration to the gastric lining in rats twice a day for 13 weeks. This is not a relevant mode of exposure for personal care products, but it does demonstrate some potential hazard for repeated dosing of diluted baking soda that has not been chemically broken down through cooking.

Talc

CAS # 14807-96-6

The International Agency for Research on Cancer lists talc containing asbestos as carcinogenic to humans while perineal use of talc is classified as possibly carcinogenic. Inhaling talc adversely affects lungs, and applying talcum powders perennially may be linked to ovarian cancer. Companies can use talc, as long as they have a certificate of purity on file verifying it is free of asbestos and asbestiform talc. Talc should not be used in products for peritoneal use in adults, infants or children.

Titanium Dioxide

CAS # 13463-67-7

Titanium dioxide is an effective UV filter in cream- and lotion-based sunscreens, and appears to be safe in creams regardless of particle size. However, when titanium dioxide can be inhaled it is considered a possible carcinogen by the International Agency for Research on Cancer and California's Proposition 65 list of chemicals. Non-nanoized titanium dioxide generally has particle sizes that are too large to inhale, but the verdict is still out on the respirability of TiO₂ when nano particles are used in powders. It should not be used in powders or sprays, where it could be inhaled and consequently a concern for lung cancer.

Tocopherol Acetate**CAS # 7695-91-2**

Tocopherol acetate may be contaminated with hydroquinone, which is linked to cancer and organ-system toxicity. We recommend that companies using tocopherol acetate source from suppliers who can certify it is not contaminated by hydroquinone.

Tocopherol**CAS # 1406-18-4**

As noted above, tocopherol acetate is the more significant concern due to potential contamination with hydroquinone. Tocopherol (naturally occurring) is on the TEDX list of potential endocrine disruptors. However, there is only one study listed, which assessed blocking ability on dihydrotestosterone. Vitamin E is a necessary nutrient, but we suggest companies keep an eye on the literature in the event the findings above are replicated.

Occupational Concerns

The ingredients below are not indicated by authoritative bodies as potential concerns for use in products, but they can have adverse effects on the workers who make the products, or on salon workers who use them repeatedly.

Ammonium Hydroxide

CAS # 1336-21-6

Ammonium Hydroxide is of concern for certain occupations due to increased inhalation risk. It can be corrosive to the eyes, skin, respiratory tract, and on ingestion as well. High concentrations may cause laryngeal oedema, inflammation of the respiratory tract and pneumonia. Companies should work with suppliers to ensure worker safety during production.

Butoxyethanol

CAS # 111-76-2

Certain occupations are at high risk of butoxyethanol exposure through inhalation, ingestion, and skin contact which can cause irritation to the eyes, skin, nose, and throat. The Occupational Safety and Health Administration (OSHA) notes it as an occupational concern. Companies should work with suppliers to ensure worker safety during production.

Butylated hydroxytoluene; BHT

CAS # 128-37-0

Butylated hydroxytoluene (BHT) are used as preservatives in a variety of personal care products. The American Conference of Governmental Industrial Hygienists (ACGIH) has determined that there is moderate evidence that BHT is a human respiratory irritant. Companies should work with suppliers to ensure worker safety during production.

Calcium Hydroxide

CAS # 1305-62-0

Calcium hydroxide can be absorbed into the body by inhalation of its aerosol and by ingestion. It is an occupational concern due to irritation of the respiratory tract and prolonged exposure may result in dermatitis and respiratory complications. Companies should work with suppliers to ensure worker safety during production.

Mica**CAS # 12001-26-2**

Workers are at high risk of mica exposure through inhalation, which causes respiratory irritation. Additional adverse reactions include coughing, difficulty with breathing, lung disease, weakness, exhaustion, and weight loss. NIOSH notes it as an occupational concern. Companies should work with suppliers to ensure worker safety during production.

Sodium Hydroxide**CAS # 1310-73-2**

Sodium hydroxide (also known as lye), irritates the mucous membrane, irritates and burns the eyes and skin, may inflame lung walls, and may lead to hair loss. It is an occupational concern due to its caustic nature, but it can be used safely if workers are protected from unsafe exposures. Its use in soap-making, is acceptable as long as it the lye fully reacted. It is also acceptable as a pH balancer at very low concentrations. Companies should work with suppliers to ensure worker safety during production.

Potential Endocrine Disrupting Chemicals

The following chemicals are on the Red List because of a single scientific study showing endocrine disruption potential and no other known health effects (see TEDX list of potential endocrine disruptors at <https://endocrinedisruption.org/>). They should not be used if there are safer alternatives available. If there are no safer alternatives, the chemical can continue to be used in a product but we recommend that companies continue to look for alternatives and keep an eye on the science. If further studies of the chemical are published showing endocrine disruption or other health effects, its use should be discontinued.

2,8-dibromodibenzo-p-dioxin
CAS # 38964-22-6

2-Butanone, 4-(4-hydroxyphenyl)
CAS # 5471-51-2

Ethanone, 1-[2,3-dihydro-1,1,2,6-tetramethyl-3-(1-methylethyl)-1H-inden-5-yl]-
CAS # 68140-48-7

Octadecanoic acid
CAS # 57-11-4

Oleic Acid
CAS # 112-80-1

Phenolsulfonphthalein
CAS # 143-74-8

Sodium Bicarbonate
CAS # 144-55-8

Solvent Naphtha (Petroleum), Medium Aliph
CAS # 64742-88-7

Vitamin E
CAS # 59-02-9