



Final Criteria: Colorants in Plastic Trash Bags and Can Liners

July 26, 2023

Green Seal's Certification for Plastic Trash Bags and Can Liners

On April 6, 2023, Green Seal issued Edition 1.0 of the GS-60 Standard for Plastic Trash Bags and Can Liners to recognize trash bags and can liners that exhibit health and environmental leadership. The criteria include requirements for functional performance, recycled content, low levels of virgin plastic, packaging sustainability, and restrictions on several hazardous chemicals such as carcinogens, heavy metals, phthalates, per- and polyfluoroalkyl substances (PFAS), and fragrances that can further pollute the recycled plastic supply chain or pose harm to users.

Standard Update

Green Seal has issued a clarification to the final standard criteria to exempt two commonly used colorants, carbon black and titanium dioxide,¹ from the requirements that a product cannot contain any intentionally added carcinogens. Currently, these chemicals are prohibited in the standard due to their classification as a Possible Human Carcinogen (Group 2B) via inhalation by the International Agency for Research on Cancer (IARC).² The exemption of carbon black and titanium dioxide is based on the following:

- Green Seal has taken a technical position on exempting these colorants in other standards because:
 - Titanium dioxide and carbon black are only considered possibly carcinogenic when inhaled, which is not a pathway of exposure in this standard and other Green Seal standards where this exemption exists
 - There are no alternatives available that perform similar functions
- Prohibiting the use of colorants results in the unintended negative consequence of impeding manufacturers from using more recycled content

More information on the technical justification for this update can be found in the research summary below.

¹ Titanium dioxide: EC Number 236-675-5, CAS Number 13463-67-7; carbon black: EC Number 215-609-9, CAS Number 1333-86-4.

² IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 93, 2010, <https://monographs.iarc.fr/iarc-monographs-on-the-evaluation-of-carcinogenic-risks-to-humans-28/>

Research Summary on Standard Update

Titanium Dioxide and Carbon Black Overview

Both titanium dioxide and carbon black are stable and non-reactive chemicals that have poor solubility in liquids. As a result, they are commonly used as colorants in formulas to whiten, brighten, or opacify (titanium dioxide), or darken (carbon black). Titanium dioxide is approved as a color additive by the US Food and Drug Administration for use in food, drugs, cosmetics, and medical devices.³ It is a common ingredient in household products including sunscreen, toothpaste, and makeup, and is added in food-grade form to whiten and opacify foods such as mayonnaise, yogurt, and powdered sugar. Carbon black refers to a family of products that are used mainly in rubber production, but also can be used as a black pigment in many different types of goods such as tires, hoses, footwear, and extruded goods like trash bags.²

Hazard Classification of Titanium Dioxide, Carbon Black

Titanium dioxide and carbon black are currently prohibited as components in GS-60 due to their classification as Possible Human Carcinogens (Group 2B) via inhalation, as defined and listed by the International Agency for Research on Cancer (IARC).² However, Green Seal has identified that there is no risk for inhalation of these colorants in trash bags. These components are matrixed into the plastic film and are not expected to aerosolize during use to be inhaled by the user. Additionally, titanium dioxide and carbon black are not considered environmental hazards, i.e. they are not known to be toxic to aquatic life or to bioaccumulate.

As a result, Green Seal is allowing the use of titanium dioxide and carbon black in trash bags and can liners. Green Seal has taken this technical position on titanium dioxide in our cleaning product standards where we allowed its use when there was not a risk of inhalation to the user.⁴ Additionally, titanium dioxide and carbon black are also allowed in our standard for paints, coatings, stains, and sealers given the low risk to the user of inhalation of these colorants, and the lack of readily available functional alternatives.

Colorants Allow Use of Recycled Content

In accordance with international best practices in standard development, Green Seal has identified the need for an urgent, substantive update to the standard criteria due to an unintended negative consequence of the criteria issued in April 2023. Mainly, titanium dioxide and carbon black allow manufacturers to make trash bags and can liners with more recycled content because they can use colorants to obscure the various colors from post-consumer material. For example, plastic films are typically not sorted by color during the recycling process; the resulting recycled material is a blend of whatever colors were present in the collected material.⁵ For food wraps, product overwraps, and case wraps, blended colors are less desirable than clear plastic films. Trash bags, on the other hand, can be made in a broader color range and can therefore incorporate higher levels of recycled plastic films. Prohibiting the use of these two commonly used colorants that are not expected to be harmful because they are not inhaled in this product category would result in the need for more virgin plastic material, which was not the intended outcome of the standard.

³ Summary of Color Additives for Use in the United States in Foods, Drugs, Cosmetics, and Medical Devices, <https://www.fda.gov/forindustry/coloradditives/coloradditiveinventories/ucm115641.htm>

⁴ Green Seal Library of Standard Documents. <https://greenseal.org/green-seal-standards/library/>

⁵ The Association of Plastic Recyclers: PE Film. <https://plasticsrecycling.org/pe-film-design-guidance>

Colorants Exemption in GS-60 Standard – Prohibited Components

Below are tracked changes (noted with a ~~strike through~~ for deletions, and red text for additions) that show the exemption in GS-60 of carbon black and titanium dioxide.

GS-60 Standard, Criterion 3.3. Prohibited Components

3.3 Prohibited Components. The product shall not contain any of the following *components*; an exception shall be made for products that would not contain these *components* but for the addition of *post-consumer material*.

- *Carcinogens, mutagens, and reproductive toxins*
- Toxic Release Inventory Persistent, Bioaccumulative, and Toxic (TRI PBT) Chemicals
- Phthalates
- The heavy metals lead, cadmium, mercury, or hexavalent chromium; either in the elemental form or compounds
- *Per- and Polyfluoroalkyl Substances (PFAS)*
- *Fragrances*
- Chlorinated compounds
- Biocides and antimicrobial agents

Exemption:

An exception shall be made for titanium dioxide and, for products that are pretinted by the manufacturer, carbon black. As allowed under this exception, carbon black shall be less than or equal to 1% by weight of the product.¹

¹ Titanium dioxide: EC Number 236-675-5, CAS Number 13463-67-7; carbon black: EC Number 215-609-9, CAS Number 1333-86-4.

Questions

For questions on this clarification and Green Seal's Standard for Plastic Trash Bags and Can Liners, please reach out to standards@greenseal.org