



PolyBak Sustainability

Introduction

The purpose of this white paper is to summarize the sustainability benefits of PolyBak vs its competition. We will speak to the topic of sustainability in several areas:

- Carbon Footprint aka Green House Gas (GHG) emissions in its manufacture.
- Volatile Organic Compound (VOC) emissions in its manufacture.
- It's material makeup relative to banned chemicals on the Proposition 65, and REACH lists.
- It's impact on indoor air quality when used in applications that are inside buildings.
- Use of recycled and renewable materials in its manufacture.

PolyBak is made by impregnating kraft liner board paper with a polyurethane resin system. Master rolls of paper (6,000-22,000 LF each, depending on paper thickness) are coated, then cured for several days at room temperature. The master rolls are then sheeted to customer requirements.

Competitive products are made by saturating kraft paper with urea-formaldehyde or phenolic-formaldehyde resins. The saturated paper is then either completely cured with heat, and cut into sheets, or is partially cured with heat and later completely cured under pressure and heat in sheet sizes.

Carbon Footprint

For the purposes of this section of the paper, we are referring to Scope 1 and Scope 2 GHG emissions. For reference, Scope 2 is generally GHG from electrical power generation that is consumed by the facility manufacturing the product, and Scope 1 is the GHG from combustible materials used to generate heat in the manufacturing facility and process, and the controlled transportation of the product (forklifts, company owned trucks, etc.).¹

Research suggests the GHG emissions in the manufacture of both polyurethane and formaldehyde based resins are similar, and are not included here.

Given that the PolyBak processes uses a room temperature cure process, heat generation and the associated GHG created are eliminated. Energy, and associated GHG created, used to generate the high pressure needed for the competitors' press process are also eliminated.

We therefore conclude that GHG emissions are significantly lower with PolyBak than formaldehyde based competitors.

VOC Emissions in Manufacturing

The room temperature cure process for PolyBak referenced above not only doesn't require supplemental heat to accomplish, it also does not reach a temperature where VOCs are created and released to the environment. Other suppliers of phenolic and urea-formaldehyde backers and overlays all have

¹ US EPA website: <https://www.epa.gov/climateleadership/scope-1-and-scope-2-inventory-guidance>

emissions permits due to the level of VOCs and other chemicals they are exhausting from their facilities into the air around them.²

Banned Chemicals

California has published a list of 1,000+ chemicals “known to the state to cause cancer or reproductive toxicity” known as the “Proposition 65” list.³ Similarly, the European Union has published a list of over 26,000 “substances of very high concern” known as the “REACH” list.⁴

Both PolyBak and competitive backers and overlays are all made with paper. None of the chemicals used to make paper are listed on either list.

PolyBak is made with a resin that is a proprietary blend of chemicals broadly known as polyurethane. None of the chemicals in the PolyBak resin are listed on either list.

Competitive backers and overlays are most often made with urea-formaldehyde and phenolic formaldehyde resins that contain chemicals on both the Proposition 65 and REACH lists.

Indoor Air Quality

Greenguard is a certification offered by UL Labs that is intended to measure the VOC and formaldehyde emissions of any product.⁵ In order to obtain the various certificates, products must achieve a maximum of the following values:

Certification Level	Max Total VOC (mg/cubic meter)	Max Formaldehyde (parts per million)	Total Aldehydes (parts per million)
Greenguard	0.25	0.025	0.05
Greenguard Gold	0.22	0.0073	0.043

Some competitors of PolyBak have worked on their products, and have moved from Greenguard certification to Greenguard Gold. PolyBak has always been Greenguard Gold, and our specific test values are:

	Max Total VOC (mg/cubic meter)	Max Formaldehyde (parts per million)	Total Aldehydes (parts per million)
PolyBak	0.009	.001	0.001

Recycled and Renewable Materials

Most PolyBak and some competitive materials are made from paper that is typically 20-25% recycled content. PolyBak 56# brown and 67# ivory products are both made without recycled content for superior consistency in the surface of the paper.

² US EPA website: <https://awsedap.epa.gov/public/single/?appid=20230c40-026d-494e-903f-3f112761a208&sheet=5d3fdda7-14bc-4284-a9bb-cfd856b9348d&opt=ctxmenu.currsel>

³ California OEHHA website: <https://oehha.ca.gov/proposition-65/about-proposition-65>

⁴ EU European Chemicals Agency website: <https://echa.europa.eu/candidate-list-table>

⁵ UL Greenguard Certification website: <https://www.ul.com/services/ul-greenguard-certification>

