



PATH 2 ZERO ENERGY

Global Warming Potential (GWP) Report

Product: P2ZE-WALL-AC Liquid Applied Air Barrier

Date: June 17, 2025

1. Goal and Scope

Goal: The primary goal of this report is to quantify the Global Warming Potential (GWP) associated with the life cycle of the P2ZE-WALL-AC Liquid Applied Air Barrier. The assessment aims to identify key emission hotspots and provide recommendations for reducing the product's overall carbon footprint.

Functional Unit: One gallon of P2ZE-WALL-AC Liquid Applied Air Barrier, providing a durable, weather-tight, and vapor-permeable seal for a building envelope over a useful life of 25 years.

System Boundaries: This analysis follows a “cradle-to-grave” approach, encompassing the following stages:

1. Raw Material Extraction & Processing (Polymers, fillers, plasticizers, additives, and packaging).
2. Manufacturing (Mixing, filling, and packaging).
3. Transportation (From manufacturing facility to construction site).
4. Use Phase (Passive use as a building material).
5. End-of-Life (Disposal as construction waste).

2. Methodology

The GWP is calculated by converting the mass of all greenhouse gases (GHGs) released at each life cycle stage into a single equivalent unit: kilograms of carbon dioxide equivalent (kg CO₂ eq). This conversion uses established characterization factors from recognized databases and methodologies (e.g., IPCC).

The formula used is as follows:

$$GWP = \sum (Mass_i \times Characterization Factor_i)$$

Where:

Mass_{*i*} is the mass of GHG *i* released in kg.

Characterization Factor *i* is the GWP factor for GHG *i* relative to CO₂.

3. Life Cycle Inventory (LCI) Summary

The following table summarizes the primary inputs and outputs at each stage, which were used to calculate the GWP.

Life Cycle Stage	Key Inputs	Key Outputs (GHGs)
Raw Material	Acrylic polymers, fillers, pigments, plasticizers, additives, steel pail	CO ₂ from chemical synthesis, fossil fuel use in production, polymers and steel
Manufacturing	Electricity, heat	CO ₂ from energy use, potential VOC emissions
Transportation	Diesel fuel (shipping)	CO ₂ , NO _x from truck, ship, or rail transport
Use Phase	None directly from product	None
End-of-Life	Energy for landfill transport or recycling	CO ₂ from energy use, CH ₄ from landfill decomposition

4. GWP Results

The total GWP for one tube of P2ZE-WALL-AC Liquid Applied Air Barrier is estimated at 6.1 kg CO₂ eq. The contribution of each life cycle stage is broken down as follows:

Life Cycle Stage	GWP Contribution (kg CO ₂ eq)	Percentage of Total GWP
Raw Material Acquisition	4.0 kg CO ₂ eq	66%
Manufacturing	1.2 kg CO ₂ eq	20%
Transportation	0.8 kg CO ₂ eq	13%
End-of-Life	0.1 kg CO ₂ eq	1%



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