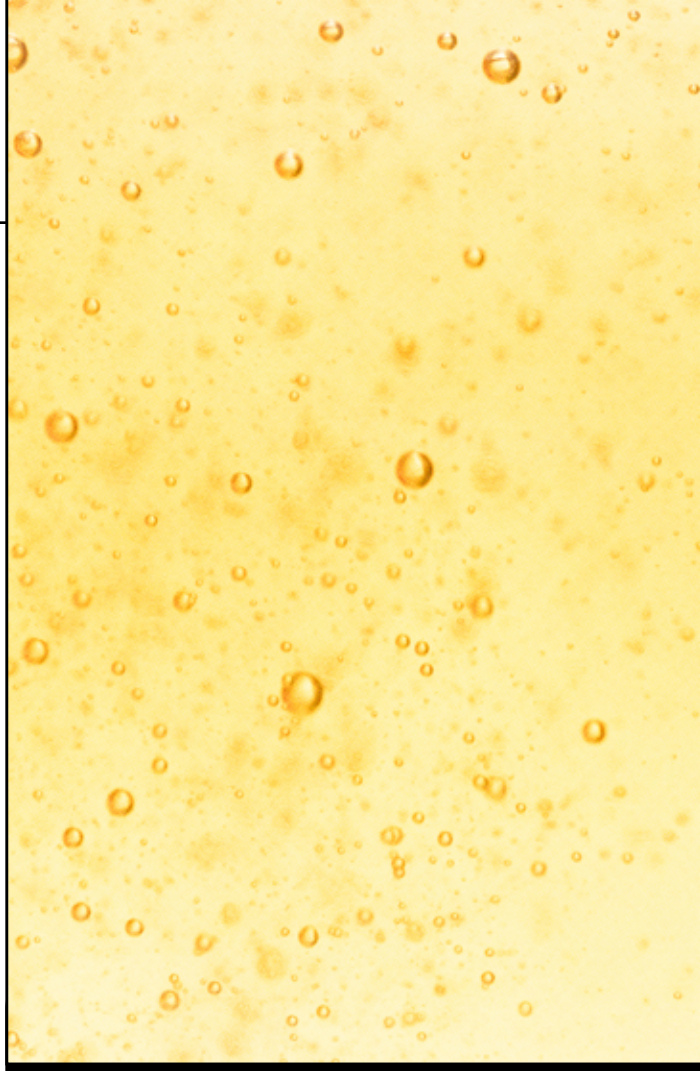
Linseed Oil

Chemical and Environmental Justice Impacts in the Linseed Oil Life Cycle

Many AEC professionals may not be aware that the building products they specify can have environmental justice impacts.

Product manufacturing often involves the use and release of toxic chemicals throughout the supply chain, impacting human and environmental health and contributing to environmental injustice.

As built environment practitioners seek to reduce the environmental justice harms caused by their material selections, understanding the role that linseed oil plays can help raise awareness of potential impacts.



WHAT IS ENVIRONMENTAL JUSTICE?

The Environmental Justice Health Alliance for Chemical Policy Reform (EJHA) defines environmental justice (EJ) as a set of principles and a grassroots-led movement that "arose in response to the disproportionate exposure of communities of color and low-income communities to harmful pollution, toxic sites and facilities, and other health and environmental hazards."[1]

Read more about the **Principles of Environmental Justice**.

This study explored the chemical and environmental justice impacts of linseed oil manufactured in the United States for industrial purposes, excluding food-grade linseed oil.

You may be familiar with building products that use linseed oil, such as linoleum, certain wood finishes, and linseed oil paints.[2,3] Linseed oil is a biological material extracted by mechanically pressing flaxseeds.[3,4] While biological materials often pose fewer hazards across their life cycle than synthetic materials, it is important to consider how they compare to alternatives and the potential to further reduce any health impacts.

Habitable assessed the chemical hazard and environmental justice impacts of linseed oil according to five criteria:

1 **avoid hazardous chemicals**
2 **prevent accidents**
3 **prevent pollution and waste**
4 **abide by environmental regulations**
5 **prevent disproportionate and cumulative impacts.**

Habitable's analysis included the two facilities identified as producing industrial linseed oil in the United States.[5–10] This research was conducted in 2024.

Key Findings:

- Linseed oil is derived from a biological material. Its production commonly uses one hazardous chemical: a fossil fuel-based solvent.
- We identified no hazardous chemical incidents—such as fires, spills, and other nonroutine releases—related to linseed oil manufacturing.
- Linseed oil production facilities generate more than 100,000 pounds of related hazardous chemical waste, including releases to the air and water, each year.
- Facilities that produce linseed oil had no significant violations of U.S. Environmental Protection Agency (EPA) regulations in the previous 12 quarters.
- The combined communities surrounding linseed oil manufacturing have a higher percentage of American Indian population than in the U.S. overall.

Learn more about Habitable's research process in our Chemical and Environmental Justice Impacts Methodology.

CRITERIA FOR CHEMICAL AND ENVIRONMENTAL JUSTICE IMPACTS	FINDINGS ON LINSEED OIL
Avoid hazardous chemicals	The inputs are a biological material with a fossil fuel-based solvent. One chemical used as an input for linseed oil production (a solvent) is hazardous to human health. One chemical (a solvent) is highly reactive or flammable. One chemical (a solvent) is volatile. Other solvent options that are less hazardous are available. Processes that avoid using a solvent also exist, though they are somewhat less effective. Linseed oil production does not require the use of this hazardous solvent. Linseed oil itself is not considered hazardous.
Prevent accidents	No chemical incidents related to linseed oil manufacturing were identified.
Prevent pollution and waste	Facilities manufacturing industrial linseed oil in the United States for potential use in linoleum report that they: • generate about 148,000 pounds of hazardous linseed oil-related chemical waste on average each year (combined); • release an average of 145,000 pounds of hazardous linseed oil-related chemicals into the air and water each year (combined). Some of this waste and these releases may be tied to extraction of other seed oils at the same facility.
Abide by environmental regulations	None of the linseed oil facilities had significant violations of EPA regulations within the previous 12 quarters.
Prevent disproportionate and cumulative impacts	Compared with the United States overall, the combined communities surrounding linseed oil manufacturing facilities have a: • lower percentage of people of color (18% near linseed oil facilities versus 40% in the U.S. overall); • lower percentage of low-income households (28% versus 30%); • lower percentage of limited English-speaking households (2% versus 5%); • similar percentage of children as the nation overall (22%). While the overall percentage of people of color living near linseed oil facilities is less than the nation overall, the specific racial composition of the combined communities reveals a significant disparity: American Indian residents make up 1.2% of these communities, double the national proportion of 0.6%. We further found cumulative impacts: • Cities with linseed oil manufacturing facilities contain other industrial sites that release and/or manage hazardous chemicals—up to 5 in one instance—compounding the negative health impacts on those communities. • In 2022, each individual city experienced collective releases of hazardous chemicals ranging from 92,000 pounds in one location to 283,000 pounds in another.

Research Details

EPA reports violations quarterly. Compliance data for linseed oil facilities is from July 2024.

TRI analysis was based on data through the 2022 reporting year. Average annual releases and waste represent the most recent five years for which data was available at the time of the research (2018–2022).

Habitable used EJScreen version 2.3, including U.S. Census Bureau American Community Survey data for 2018–2022.

Sources specific to linseed oil are included to the right and in the accompanying spreadsheet. See Habitable's Chemical and Environmental Justice Impacts Methodology for other sources used in our analysis.

Sources

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