

SUSTAINABLE GLOVE SOLUTIONS

Are biodegradable gloves the only sustainable glove option? Research suggests reviewing the full life cycle of a glove, impacting stakeholders and the environment, not only at the end of life (disposal).

BIODEGRADABLE GLOVES: ARE THEY THE ANSWER?

Nitrile gloves are made from the polymer nitrile butadiene rubber (NBR), a fossil-based polymer. Some glove manufacturers claim that the addition of specific additives will cause accelerated biodegradation of nitrile gloves. However, there is no scientific evidence to support that an additive can change the molecular structure of nitrile and allow it to biodegrade. In reality, accelerated degradation occurs, which may result in the creation of microplastics that are harmful to humans and the environment.

While the sources and data used to support nitrile glove biodegradability claims may look legitimate, they can be misleading. It is reported that claiming “biodegradability” without indicating the environment in which the biodegradation takes place is increasingly perceived as greenwashing and should not be used.

Standards Relating to Plastic Biodegradability

The applicable standards relating to plastic biodegradability (and applicable to nitrile) both measure degradation over a specific time; neither test can be used to predict future biodegradation. These tests do not provide pass/fail qualifications, therefore a product can be tested against these standards, but it does not result in a certification or proven biodegradability.

1. **ASTM D5511-18 - Measures Laboratory Conditions***

**This standard is currently under review to strengthen guidelines on biodegradable claims. - source*

Limitations: Because there is a wide variation in the construction and operation of anaerobic-digestion systems and because regulatory requirements for composting systems vary, this procedure is not intended to simulate the environment of any particular high-solids anaerobic-digestion system. However, it is expected to resemble the environment of a high-solids anaerobic-digestion process operated under optimum conditions.

2. **ASTM D5526-18 - Measures Biodegradation of Materials in Landfill Scenarios****

***This standard is being balloted for withdrawal with no replacement because there is no correlation between this test and actual landfill biodegradability. - source*

Limitations: Because a wide variation exists in the construction and operation of landfills, and because regulatory requirements for landfills vary greatly, this procedure is not intended to simulate the environment of all landfills. However, it is expected to closely resemble the environment of a biologically active landfill. More specifically, the procedure is intended to create a standard laboratory environment that permits rapid and reproducible determination of the anaerobic biodegradability under accelerated landfill conditions, while at the same time producing reproducible mixtures of fully and partially decomposed household waste with plastic materials for ecotoxicological assessment.

“there is no scientific evidence to support that an additive can change the molecular structure of nitrile and allow it to biodegrade”

In summary, for either test, “further claims of performance shall be limited to the numerical result obtained in the test and not be used for unqualified “biodegradable” claims. Reports shall clearly state the percentage of net gaseous carbon generation for both the test and reference samples at the completion of the test. Furthermore, results shall not be extrapolated past the actual duration of the test.”

SUSTAINABLE GLOVE OPTIONS: FULL LIFECYCLE

Sustainable glove options are produced with the lowest stakeholder and environmental impact throughout their full glove lifecycle, from production to disposal:

Resources: Glove Raw Materials & Harmful Toxins

- Glove raw material quality is directly responsible for glove durability and performance. Conversely, gloves will rip and tear if manufactured using cheap, poor quality materials, increasing waste. Consideration must be given to gloves made from better quality materials to reduce usage. Third-party supplier certifications to verify quality are recommended.
- Cheap and toxic glove raw materials can cause glove wearer skin irritation and affect long term health. Choose gloves without accelerators and with known skin benefits.

Processing & Manufacturing:

Ansell's life cycle assessment highlights responsible manufacturing as having the greatest environmental impact, using processes that conserve resources and reduce pollution. The assessment found approximately 64% of carbon emissions came from production.

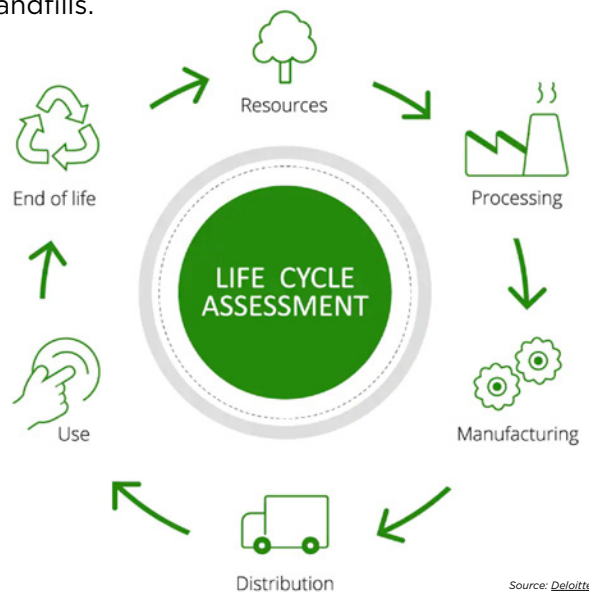
- Factories with renewable energy sources and water recycling and conservation systems will reduce greenhouse gas emissions.
- Purchasing from manufacturers with zero waste targets with recycled packaging options helps reduce emissions and waste.
- Give consideration to independent environmental and quality assurance factory audits.

Distribution:

Sourcing higher performing lightweight gloves with greater durability means more gloves per carton and container, reducing international and national CO2 transport and distribution emissions.

Usage & End of Life Waste Reduction:

- *Thickness:* Commonly glove thickness can be reduced with better quality gloves, reducing your waste stream.
- *Harmful Toxins & Chemicals:* These can cause long-term skin issues for wearers as well as contributing to land and waste water contamination. Vinyl gloves can be particularly toxic with BPA, PFAS and dioxin as well as vinyl chloride emissions during manufacture and disposal. Review glove type and trial glove quality before purchasing.
- *Waste:* Reduction is possible as more durable gloves have a lower failure rate.
- Reducing glove failures (ripping) and usage will directly reduce the amount of waste sent to landfills.



SOLUTION

Nitrile gloves deemed 'biodegradable' typically cost more, and as the evidence suggests, could be hard to justify given the unproven benefits. We encourage you to consider the full glove lifecycle when selecting a sustainable glove option, including responsibly sourced nitrile gloves with proven performance, no harmful toxins and an overall reduction in glove usage and waste.

Information has been sourced from regulatory standards & industry experts.