10 REASONS to choose MEFE's BDG™ Biodegradable Glove

10 Building ecologically sound values

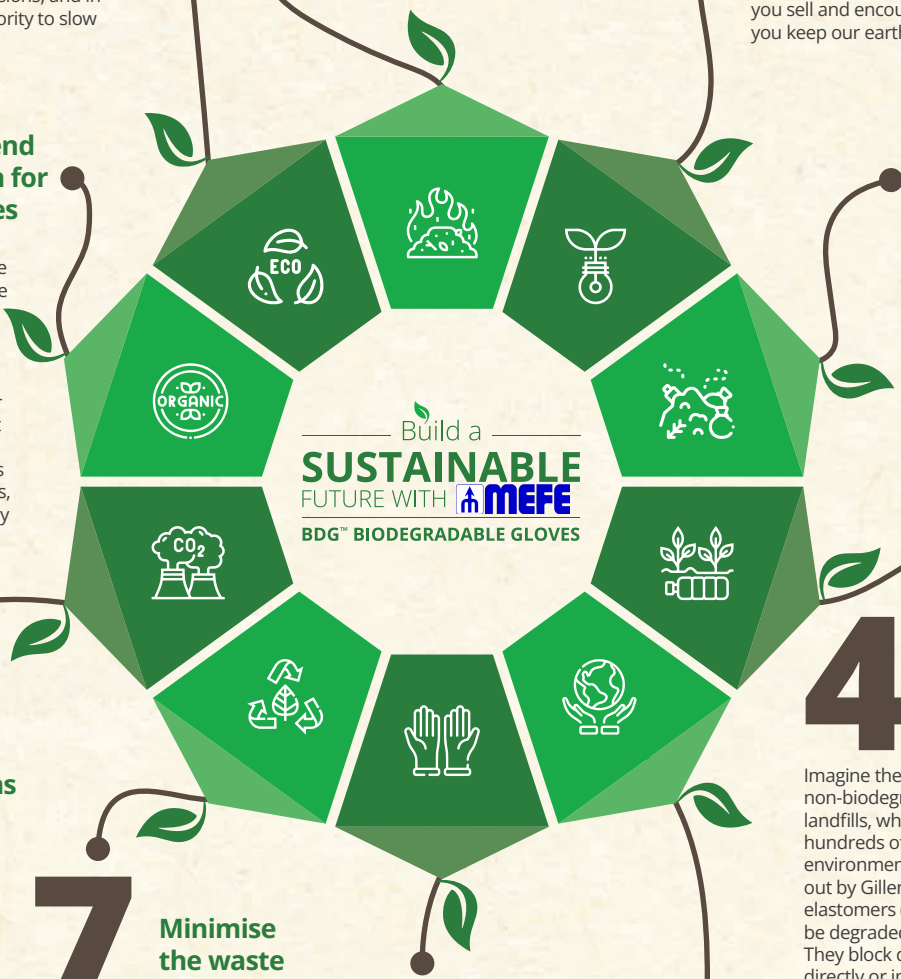
As climate change and environmental sustainability become more prevalent in the minds of consumers, companies need to examine their eco-friendly approach. The fight against GHG emissions, and in particular CO_2 is the top priority to slow down global warming.

1 The incineration impacts, emits more toxins and pollutants[1] that harm local air quality

Incineration led to a more significant negative impact on local air quality than landfill.

2 You are an initiator, not a follower

Don't wait until there is demand in the market. We should be taking up the role of initiator to educate those who lack awareness. The more you sell and encourage usage of BDG™, the more you keep our earth clean.



9 An end-to-end life solution for nitrile gloves

BDG™ contains an organic additive which makes the glove a desirable food source to microbes in landfills, leaving behind biogas, water, and inert soil only, without compromising product quality. BDG™ is an eco-friendly option for use in the medical field to protect patients and users from cross-contamination. Besides, it is designed for chemotherapy drugs, chemicals, as well as food industry and is in compliance with several regulatory bodies from U.S., E.U., Japan and Germany.

3 We are running out of space

Global waste is expected to grow to 3.40 billion tonnes by 2050[2], which is more than double of population growth over the same period. Globally, about 37 percent[2] of waste is dumped or disposed in some form of a landfill. How much space will be left for living if this continues?

8 Reduce greenhouse gas emissions

The use of biodegradable materials instead of traditional materials lessens the amount of greenhouse gas (GHG) emissions. Lowering GHG emissions is a standard operating procedure in managing landfills, but more importantly, the focus should also be on the energy recovery aspect. The 15 billion kWh/year of renewable energy released through the biodegradation process is estimated to satisfy the annual consumption of 1.3 million United States households.[5]

4 Would you rather risk using non-biodegradable materials?

Imagine the accumulation of traditional non-biodegradable nitrile gloves in the landfills, where they can potentially sit for hundreds of years and cause severe environmental problems. Studies carried out by Gillen et al. (1996) suggest that elastomers (including nitrile rubber) may be degraded for several dozens of years.[3] They block drains, harm animals and directly or indirectly cause negative environmental impact.

7 Minimise the waste

Efforts should be made to limit the environmental impact during the disposal stage of gloves. BDG™ accelerates the biodegradability process via anaerobic decomposition. The quicker the gloves decompose, the faster they are turned into biogas, water & inert soil.

6 Latex (natural rubber) gloves take a long time to decompose too

Even gloves made from latex take a long time to biodegrade because other chemicals are added to the gloves. The degradation process of rubber is very slow in normal environment. Averagely, it takes 5 years for latex gloves to decompose in the right situation.[4]

5 A goal of making a sustainable and brighter future together

Everyone should contribute to the Sustainable Development Goals (SDGs). Being an end-of-life solution for nitrile gloves, BDG™ is more than just a green innovation. Going the extra mile, we have also completed a critically reviewed Life Cycle Assessment (LCA), reflecting our continuous commitment to address environmental impacts on climate change throughout the glove production process.

BDG™ 3.5g's critically reviewed LCA result: 0.034073 kg CO_2e per glove.

References:
1. *ClientEarth, The Environment Impacts of Waste Incineration.*
2. *The World Bank, Trends in Solid Waste Management.*
3. *ScienceDirect, COVID-19 discarded disposable gloves as a source and a vector of pollutants in the environment.*
4. *Conserve Energy Future, Are Latex Gloves Recyclable?*
5. *ASCE Library, Life cycle Analysis of Energy and Greenhouse Gas Emissions from Anaerobic Biodegradation of Municipal Solid Water.*

BDG™ BIODEGRADABLE GLOVES

End-of-Life Solution for Nitrile Gloves

Creating sustainability is entrenched firmly at the core of MEFE. It is an integral part of the way we do business. Holding to our vision to be recognised as a caring company to the community and environment, MEFE constantly innovates with a passion to bring a positive change to all that we do.

MEFE's Biodegradable Gloves, **BDG**™, is one of our latest green initiatives in helping to create a better environment. It is our contribution to provide an end-of-life solution for nitrile gloves.

What is BDG™ Technology?

MEFE's BDG™ technology integrates the existing manufacturing process without compromising product quality. It comprises of an organic additive used to accelerate the biodegradation rate of gloves in biologically active landfills and anaerobic digesters.

How does BDG™ Work?

MEFE's BDG™ is a polymerised "food source", specially formulated to attract microbes found especially in landfills. When bacteria consume the BDG™ , they excrete an enzyme that dissolves and de-polymerises the polymer chain. The process called mineralization, allowing the microbes to break down the remaining polymer naturally. Leaving behind only biogas, water and inert soil. [Figure 1]

Product attributes of BDG™

- Thin gauge
- Not made with natural rubber latex
- Ambidextrous
- Chlorinated
- Fingertip textured
- Violet blue, light green & black colour
- Powder free
- Standard cuff

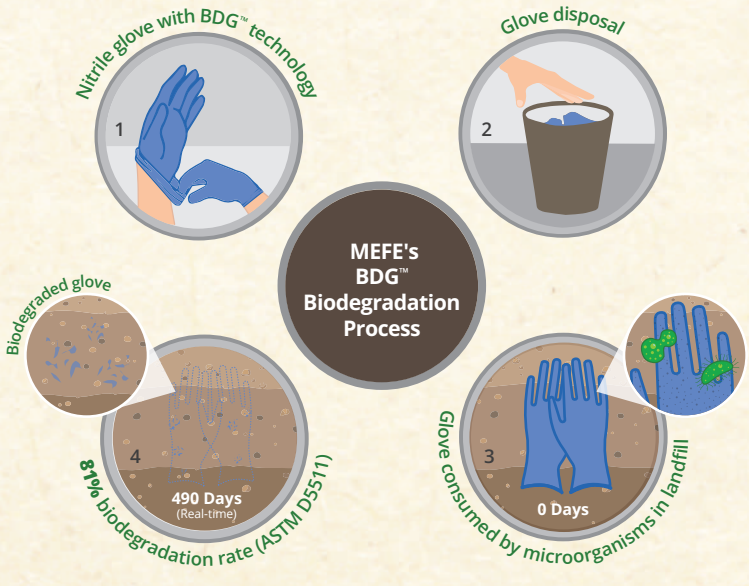


Figure 1: MEFE's BDG™ biodegradation process

The Reliability of BDG

1. Validated Biodegradation Rate

MEFE's BDG™ biodegrading efficacy has been verified by an independent lab, Eden Research Laboratory, using ASTM D5526 and ASTM D5511 methods. [Table 1]

No.	Test Method	Purpose of Testing	Result Summary
1	**ASTM D5526**	To determine the degree and rate of anaerobic biodegradation of materials in accelerated landfill conditions. This is a long term test that **replicates the landfill environment** of low heat, high pressure, limited oxygen, no light and low moisture.	**75%** biodegradation in **776 days.***
2	**ASTM D5511**	To determine the degree and rate of anaerobic biodegradation of materials in high-solids anaerobic-digestion conditions, which **replicates the anaerobic digester or landfill bioreactor environment.**	**81%** biodegradation in **490 days.***

Table 1: The biodegradation test results apply to BDG™ 2.2 mil and 3.0 mil, based on ASTM D5526 and ASTM D5511 standards. The ASTM D5526 testing results are ongoing, subject to updates as deemed necessary.

**The actual biodegradation rates will vary depending on the landfill conditions and the biological activity of microorganisms surrounding the nitrile gloves.*
***BDG™ 4.0 mil with an extended cuff (ASTM: ≥ 280 mm, EN: Median ≥ 280 mm) is now available. Contact our sales team for the latest biodegradable rate.*

2. Proven to Retain Glove Properties

Gloves with BDG™ technology do not biodegrade prior to disposal. The unique formulation only allows the biodegradation process to begin when surrounded by microbes present in a landfill environment.

Real-time shelf life study results prove that the physical property of MEFE's BDG™ gloves remains unchanged up to 3 years. [Chart 1]

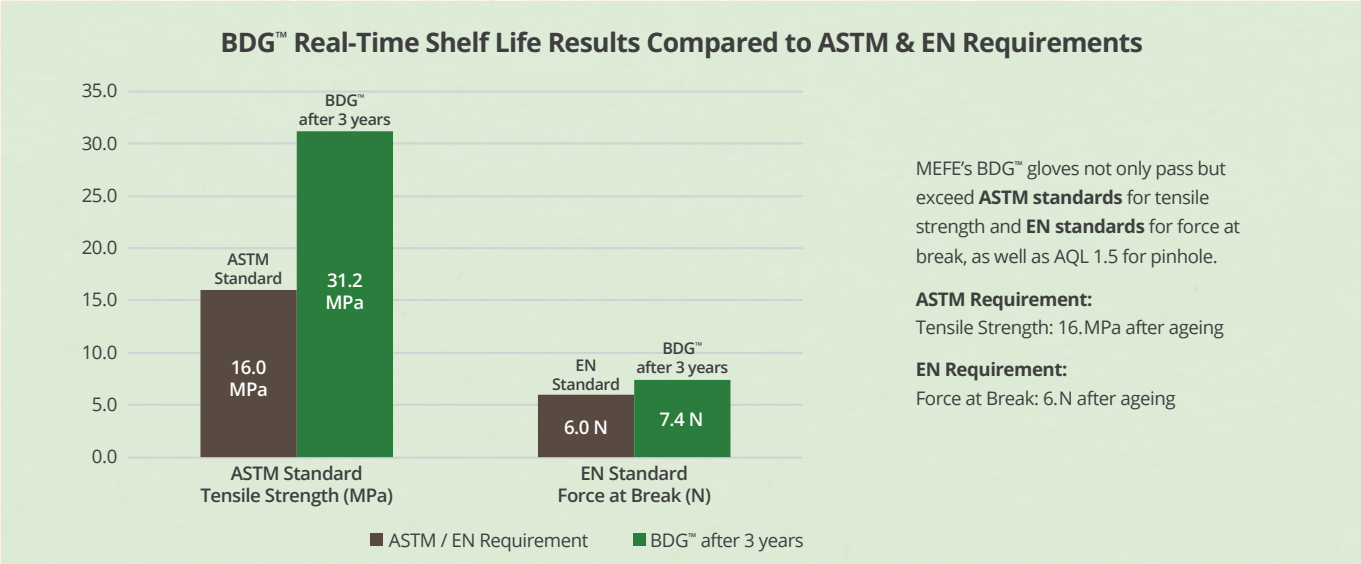


Chart 1: BDG™ real-time shelf life results.

3. Tested Safe for Biocompatibility and Food Contact

BDG™ gloves have been proven safe for use against skin according to ISO standards, as well as with food handling according to U.S. FDA, Japan Food Sanitation, European regulation (EU) No 10/2011, (EC) 1935/2004 and BfR XXI German Recommendation. [Table 2]

	ISO 10993-5	ISO 10993-10	ISO 10993-10	Food Contact	Food Contact	Food Contact
Test	Cytotoxicity Test	Primary Skin Irritation	Dermal Sensitisation Study	21 CFR 177.2600	Japan Sanitation Law	EN 1186, EN 13130 & CEN/TS 14234
Result Summary	Non-cytotoxic at 10% extract	Non-irritating	Non-sensitising	Pass	Pass	Pass
Compliance	✓	✓	✓	✓	✓	✓

Table 2: List of biocompatibility and food contact test results for BDG™.

BDG™ Nitrile Powder Free Gloves Specifications

	4.0 mil	
	ASTM	EN
Features		
Powder free, fingertip textured, ambidextrous, standard cuff		
Physical Dimensions		
Length (mm)	≥ 280	Median ≥ 280
Palm (centre of palm) (mm)	0.09 ± 0.02	Median 0.09 ± 0.02
Finger (13mm ± 3mm from tip)	0.14 ± 0.02	Median 0.14 ± 0.02
Physical Properties		
Tensile strength (MPa)		
Before ageing	≥ 18	N/A
After ageing	≥ 16	N/A
Elongation (%)		
Before ageing	≥ 500	N/A
After ageing	≥ 400	N/A
Median Force at Break (N)		
Before ageing	N/A	≥ 6
After ageing	N/A	≥ 6

Table 3: BDG™ product specifications.

Suitable industries

- Healthcare
- Life Sciences
- Food
- Industrial

MEFE Touching Lives Through Innovation

BDG™ Biodegradable Gloves help us build a sustainable future.
Together, let us keep our Earth clean.

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