TOP GLOVE
TOP QUALITY, TOP EFFICIENCY

TOP GLOVE SDN. BHD. (Company No. 220483-T) (GST ID: 000562692096)
The World's Largest Rubber Glove Manufacturer
GOOD HEALTH, SAFETY FIRST & BE HONEST

A member of Top Glove Corporation Bhd, a Public Listed Company on Bursa Malaysia & Singapore Exchange.

SALES & CORPORATE OFFICE : Top Glove Tower, 16, Persiaran Setia Dagang, Setia Alam, Seksyen U13, 40170 Shah Alam, Selangor D. E., Malaysia.
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BUSINESS DIRECTION : To Produce Consistently High Quality Gloves At Efficient Low Cost.
FACILITIES : 34 Factories (Malaysia, Thailand & China), 581 Production Lines, 55.8 Billion Gloves Per Annum, 12,000 Employees.
MARKET : Exports to 195 countries worldwide with Marketing Offices in the USA and Germany.

LETTER OF JUSTIFICATION

Name of Device : **Nitrile Examination Powder Free USEW 35 Biodegradable Pastel Green Glove 468074B Techtile Examination Nitrile Gloves Chemo-tested Biodegradable Pastel Green**

Type : **Powder Free**

Date issued : **27th September 2022**

We hereby declare that the Nitrile Examination Powder Free USEW35 Biodegradable Pastel Green Glove that the gloves are specially designed to biodegrade in landfills through microbial process.

Biodegradable process occurs when polymer materials in which **all the organic matter can be converted into biomass, water, carbon dioxide, and/or methane** through the action of naturally occurring microorganisms such as bacteria and fungi in ambient conditions. Our biodegradable glove will not generate micro plastic after the biodegradation process. The residue of the glove after it biodegrades such as its inorganic matter will mix in the soil and will not linger as microplastic.

Please find below simple mechanism to explain how biodegradation process of our gloves.

- Generally, the degradation process occurs in two steps:
  In the **first step**, the surface of the gloves undergoes erosion, by which the outermost layer of the glove is broken down.
  In the **second step**, microorganisms secrete enzymes which will chemically break down the glove materials. The resulting product are methane, carbon dioxide and inorganic material that can be readily consumed by the microbial population.

  Our special additive helps to expedite this process by attracting specific microorganisms from landfill soils that are capable to digest the nitrile glove materials.

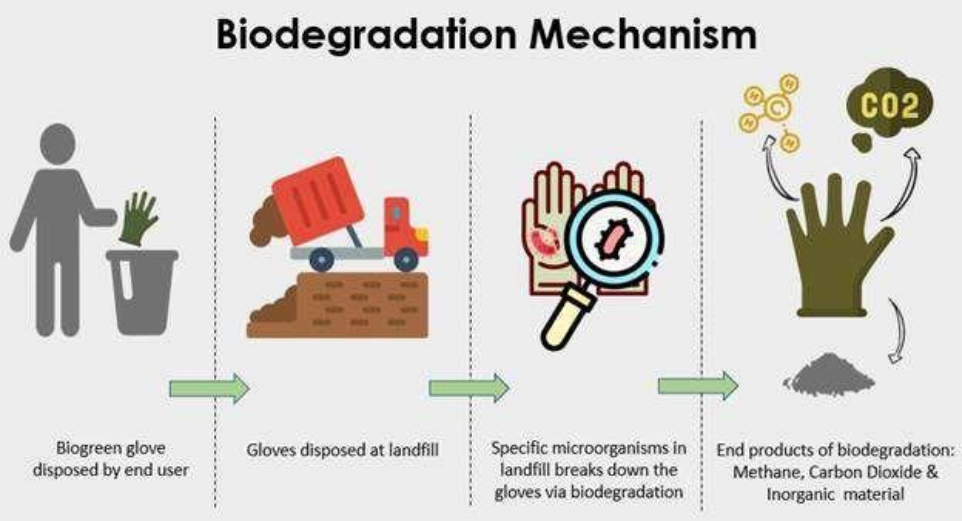

Figure 1: A diagram on the biodegradation process of rubber gloves

In addition, our biodegradable gloves show up to **36.7%** biodegradation in **513 days** as compared to conventional nitrile gloves under the ASTM D5511 standard method. Please find attached our ASTM D5511 report for your reference. From this report, the quantified biodegradation is in reference to the released methane and carbon dioxide gases which is part of the residue formation of the biodegradation process. Furthermore, the gloves are estimated to biodegrade around 95% based on the organic component in the glove composition. Please refer to breakdown of organic and inorganic matter in table below for reference.

Table1: Nitrile Examination Powder Free USEW35 Biodegradable Pastel Green Glove

No.	Chemicals	Percentage, %	Inorganic/ Organic matter
1	Synthetic latex	**92.92**	**Organic**
2	pH stabilizer	0.38	Inorganic
3	Activator	1.39	Inorganic
4	Additives	**0.34**	**Organic**
5	Crosslinking agent	0.74	Inorganic
6	Antioxidizing agent	**1.21**	**Organic**
7	Stabilizer dosage	**1.53**	**Organic**
8	White Pigment	1.49	Inorganic
Total		100	

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To confirm a specific stipulated timeline is unlikely for any biodegradable material as it is influencedby many factors associated with the environmental conditions of a particular landfill. However, we could potentially say based on our ASTM D5511 data the biodegradation of this product is at least 10 time faster compared to conventional nitrile gloves. As an example, if a conventional nitrile glovetakes 30 years to biodegrade in a specific landfill condition, our biodegradable nitrile glove product would take 3 years to biodegrade in that particular landfill conditions. As the process of biodegradation can naturally occur upon disposal in landfill, there is no need for any special equipment or chemical to aid the biodegradation.

Prepared by,	**Checked by,**	**Verified by,**
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