BIODEGRADABLE GLOVES: WHAT TO LOOK FOR

THE USE OF SINGLE-USE GLOVES HAS EXPLODED IN THE WAKE OF THE PANDEMIC. SUSTAINABLE SOLUTIONS ARE DESPERATELY NEEDED TO TACKLE THE GROWING VOLUME OF ASSOCIATED WASTE. NICOLAS BYKOFF, HEAD OF CONTENT AND DIGITAL MARKETING AT SHOWA EUROPE, HIGHLIGHTS FIVE THINGS TO LOOK FOR IN A (GOOD) SINGLE-USE BIODEGRADABLE GLOVE

When you hear that a glove is biodegradable, you need to consider whether the glove will achieve a high level of degradability under controlled conditions. How fast will the glove degrade? Under which conditions? Will biodegradability affect the glove's shelf life or efficiency?

SHOWA, a fully-integrated manufacturer of both medical and industrial personal protective equipment (PPE) hand protection, has listed five factors that you should consider when looking to switch to single-use biodegradable gloves.

SPEED OF BIODEGRADATION

When comparing biodegradation speeds, there are two methods needed: aerobic and anaerobic biodegradability.

Aerobic biodegradability can be achieved in an environment where composting conditions including temperature, aeration, and humidity can be closely monitored and controlled. As specified in ISO 14855-1, this method simulates typical aerobic composting conditions for the organic fraction of solid mixed municipal waste. The test method is designed to show how much of the glove's carbon content is transformed into carbon dioxide (expressed as a percentage), and the rate of conversion.

Anaerobic biodegradability refers to the degradation of compounds by microorganisms in the absence of oxygen. During this process, microorganisms utilise a chemical other than oxygen as an electron acceptor. SHOWA uses anaerobic biodegradability to define the extent to which its Eco Best Technology (EBT) accelerates biodegradability.

PHYSICAL AND CHEMICAL RESISTANCE PROPERTIES

To the best of SHOWA's knowledge, biodegradable gloves can be composted if the nitrile molecule chains are not overly crosslinked (or are not crosslinked at all). This balance defines the speed of degradation.

The main concern with excessively fast degradation is the effect this has on the glove's physical and chemical resistance properties. A glove with a high biodegradation speed in aerobic composting (for example, over 80% degradation within 90 days) will probably have less effective physical and chemical properties. Both air and moisture affect durability, while even storage conditions can affect the glove's initial performance.

Gloves that biodegrade quickly may also have a lower level of tear resistance. European standard EN 455 comprises four parts and will help you define what you are looking for in a single-use glove. Part 1 specifies requirements and provides methods for testing single-use medical gloves to determine freedom from holes (resistance to penetration). Part 2 addresses the physical properties of disposable gloves, including tear resistance (force at break). Part 3 provides requirements for labelling and the evaluation of biological safety. Finally, Part 4 provides requirements for determining the product's shelf life under normal storage conditions.

ECONOMIC UTILITY

Biodegradability should help to generate energy. During biodegradation, the glove releases methane gas, which can be captured in a controlled landfill and transformed into energy (like the methane captured in biogas plants).

In biogas plants that use organic agricultural waste (or sometimes municipal waste), the aerobic digestion process only lasts for a few days or weeks under anaerobic conditions. This timespan might be too short for a "compostable" glove to fully biodegrade, meaning that the methane cannot be "extracted" in quantities comparable to biodegradation in a landfill. The result is that "compostable" gloves have lower economic utility and/or cannot be exploited for energy production.

NO POSSIBLE ALLERGIES

Less than 1% of the general population is allergic to natural rubber, so the probability of people experiencing an allergic reaction when wearing single-use gloves is low. However, to avoid even the slightest risk of a reaction, the best course of action is to go for a 100% nitrile disposable glove.

GREENCIRCLE CERTIFICATION

GreenCircle is an internationally-recognised third-party certification entity. SHOWA has developed its EBT and obtained this certification because as nitrile gloves increasingly enter the market, sustainability is a top priority.

In 2012, SHOWA launched the first single-use biodegradable gloves. A host of new competitor models have since entered the market, each with their own set of claims. As a fully-integrated manufacturer, we believe greater clarification is vital in this market segment. (SM)