

Wool and Biodegradability

Fact Sheet



Key Points

- Wool is a natural, annually renewable fibre grown on sheep out of which a variety of products from apparel to interior textiles are manufactured.
- At the end of its life cycle wool products readily biodegrade, unlike most synthetic fibres.
- This has significant implications for the sustainable future of our planet.

Why is biodegradability important?

Each person worldwide produces an average of 500kg of waste each year, 25kg of which are textiles. The recent practice of waste going to landfill is not a sustainable solution, which is where natural fibres such as wool play an important part. For example, garments made out of polyester and nylon take about 40 years to degrade, whereas those made of wool take only one year.

What does “biodegradable” mean?

A biodegradable product can be broken down by a biological process (bacteria and fungi) into natural raw materials, carbon dioxide, water and naturally occurring minerals. These are then reintegrated into the nutrient cycle. Conditions needed for products to biodegrade are oxygen, warm temperatures and humidity.

How is wool biodegraded?

Wool is made by nature and thus is naturally biodegradable. It is made of a protein called keratin. During the biodegradation process, fungi first destroy the fibre ends. Bacteria then digest the weakened fibre by secreting enzymes. The carbon-to-nitrogen-ratio of wool is quite narrow, meaning that wool has a high percentage of nitrogen. This high percentage of nitrogen is the reason wool biodegrades so well.

How is wool’s biodegradability tested?

In most tests, a wool garment such as a jacket is buried in soil which provides the source of microbes, moisture, temperature and pH-value needed. To better dig out the garment, it is placed between two wire grids. Samples are dug out after one month, two months, etc. to observe and document the decay. Tests show that with the ideal conditions wool products were almost completely degraded after 6 months of burial. Seams do not degrade as easily as the rest of a garment, because they consist of a double (hence thicker) layer of fabric and are often sewn with polyester thread. The dyes used on a wool product do not have any influence on the testing results.

Will wool biodegrade while being worn?

Rest assured, wool will not biodegrade while being worn or used under normal conditions. Moreover, because wool is a durable and high-quality performing fibre it will last for years before this final stage is even a consideration.

Where can I learn more?

Contact IWTO for more information on wool and its natural technical properties:

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About IWTO

The International Wool Textile Organisation (IWTO) is an independent non-profit organisation representing the wool industry at the international level. Our mission is to connect all parts of the wool supply chain in order to strengthen wool's credentials as the world's leading sustainable fibre.

References:

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