Woven Geotextiles Durability Reference

Reduced CO_2 emissions at the Ostend Airport

For a new runway of 160.000m² at Ostend-Bruges Airport, a durable woven geotextile is installed with remarkable impact in CO_2 emissions.

Reduced carbon impact comes on multiple levels:

1. Product : Geotextile versus Gravel
2. Raw Material : PP – PET Granulate
3. Geotextile Type : Woven versus Non-woven

Product : Geotextile versus Gravel

For a new runway of 160.000m² at Ostend Airport, Terralys LF57/57, a woven geotextile, is given priority over 10 cm of gravel.

Functional unit: 1 m³

Cradle-to-Grave

Layer	Size	CO_2 emission	# Truck
Gravel	10 cm	(7,8 kg CO_2/30 cm)*10 cm = 2,6 kg CO_2	593
Terralys LF 57/57	220 gsm	(0,81 kg CO_2/175 gsm)* 220 gsm = 1,02 kg CO_2	2-3
	Source: own assumption	*Source: EAGM CO_2 per unit*	*Source: own calculation*

A 10 cm layer of gravel on a surface of 160.000m² results in 16.000 tonnes of material (2 ton/m³). Taking into account 27 tons/truck, this results in 593 trucks bringing material to the site.

The choice of woven geotextile Terralys LF57/57 resulted in CO_2 savings : 160.000 m²* (2,6 – 1,02) = 252.800 kg

Benefits for geosynthetic layer
- ✓ Significantly less CO_2 emissions
- ✓ Minimized transport
- ✓ Reduced use of materials
- ✓ Possibility to reuse soil of the excavation (even if the soil has a poor quality)

Raw Material : PP – PET Granulate

The most common polymers used in the manufacture of geotextiles are polypropylene and polyester. What is the impact of the raw material?

Functional unit: 1 kg granulate

Cradle-to-Gate

- PP-granulate: 1,65 kg CO_2/ kg granulate
- PET-granulate: 2,95 kg CO_2/ kg granulate

  Source: Plastic Europe

The choice of PP raw material over PET raw material results in CO_2 saving: 160.000 m² * (2,95 – 1,65)*0,2 kg/m² = 41.600 kg CO_2

Benefits for PP raw material

- ✓ Best-in-class polymer in CO_2 emission
- ✓ Low environmental impact
- ✓ Durable long life span
- ✓ Non-toxic, no harmful substances
- ✓ Highly resistant to microbiological and chemical degradation

Geotextile Type : Woven versus Non-woven (17kN/m)

Functional unit: 1m²

Cradle-to-Grave

Performance characteristic: Tensile strength of 17 kN/m (Valid for NorGeoSpec 3)

- Woven (92 g/m²): 0,48 kg CO_2/m²
- Non-woven (190 g/m²) : 0,99 kg CO_2/m²

Woven versus non-woven brings CO_2 saving: 160.000 m² * (0,99 – 0,48) = 81.600 kg CO_2

Benefits for woven geotextile

- ✓ > 50% less virgin material
- ✓ Less weight
- ✓ Less volume, less transport
- ✓ Reduced CO_2 emissions

Sources:

Performance characteristic: comparison of multiple suppliers

CO_2 emission: GaBi software conform with EN 15804:2012+A2 (Internal review)

June 2021 - The environmental impacts of Beaulieu Technical Textiles woven versus nonwoven geotextiles were calculated through an LCA (Life Cycle Analysis), which was verified according to ISO 14040/14044/14025 and EN 15804+A2.