



The sustainable future of your dental practice

Manufacturers of dental supplies can make a huge difference when it comes to global warming by reducing greenhouse gases in their production. As a leading manufacturer of saliva ejectors, the Swedish company Orsing launched a product line entirely manufactured from renewable resources.

In order to reduce the carbon footprint and to curb global warming, it is important to reduce the use of fossil resources and the share of greenhouse gas emissions. By using bio-based polyethylene as raw material in products and packaging, the carbon dioxide level in the atmosphere can decrease, which is a significant factor for our planet and future generations.



Hygovac[®] Bio

Hygovac Bio is an aspirator tube made of nearly 100% bio-based polyethylene, a polyethylene entirely made from sugarcane (Green PE).¹ Unlike traditional polyethylene where fossil raw materials such as oil and natural gas are used, sugarcane are completely renewable.

Hygovac Bio was launched in two new lengths, 120 mm and 95 mm giving the user the opportunity to choose a length that suits the treatment. The aspirator tubes still have the same diameter and provide the same suction capacity as traditional Orsing's Hygovac products. The 95 mm version provides easier access for hygienists and dentists when working without assistance. Less material is required during manufacture and the product takes less space during transportation and storage.



Hygoformic[®] Bio

The original mouldable saliva ejector with tongue holder used by dentists worldwide for more than 50 years is now also available in eco-friendly Green PE. Hygoformic Bio has a high suction capacity due to its 5 holes.

The holes are placed inside the coil design to avoid contact with the tongue and soft tissues and will not clog. Hygoformic Bio is seamlessly adjustable in shape and size to any patient's cheek and is also excellent for treatments at the back of the jaw. Hygoformic Bio can be connected to any dental unit by the soft Hygoformic Bio Adaptor manufactured in bio-based material.



Bio Cup

Bio cup is Orsing's new dental cup made of eco-friendly, non-toxic bamboo fibres. Unlike conventional plastic where fossil raw materials such as oil and natural gas are used, bamboo is a completely renewable resource.

It grows fast and naturally without pesticides or fertilizers and self-regenerates from its own roots, so it doesn't need to be replanted. Bamboo absorbs more CO² and produces more oxygen than trees. Research in Japan has demonstrated that bamboo can absorb as much as 12 tonnes of carbon dioxide per hectare per year, giving the plant a potentially crucial role in stabilising our planet's atmosphere.²

Notes

¹ Why "nearly 100% bio-based"? The final product is guaranteed 94-96% fossil free/renewable when manufactured. The remaining 4-6% is fossil based material that can contaminate during industrial processing. This is the highest percentage bio-based material that can be produced.

² Isagi, Y., Kawahara*, T., Kamo*, K. et al. Plant Ecology (1997) 130: 41. <https://doi.org/10.1023/A:1009711814070>



By using sugarcane-based polyethylene, Orsing reduces the level of carbon dioxide in the atmosphere and helps save our planet for future generations.

Sugarcane plantations

The sugarcane plantations where Orsing's bio products have their origin are located in the South-Central and Northeast region of Brazil, more than 2,000 km (1,200 miles) away from the Amazon Region, which means that the plantations do not affect the rainforest or the global food equation.

The expansion of areas used to plant sugarcane is governed by Sugarcane Agroecological Zoning, a regulatory framework introduced by the federal government in 2009 that prohibits planting in areas of high biodiversity. The ethanol used to make the polyethylene is purchased from different suppliers that are selected accordingly with a Code of Conduct for Ethanol Suppliers. This Code of Conduct takes into account aspects related to compliance with Brazilian labour law and respect for biodiversity. Orsing's Hygovac Bio and Hygoformic Bio are produced from suppliers that strictly adhere to this Code of Conduct.

Source: Braskem



Kg CO₂ emissions/kg of Green PE produced

Sugarcane Growing	Agricultural Operations	0,91
	Land Use Change Credits	-1,10
	CO ₂ Uptake	-3,14
		-3,33
Ethanol Production	Ethanol Production	0,03
	Bagasse Burning	0,16
	Electricity Cogeneration Credits	-1,17
		-0,98
Ím Green PE	Ethanol Transport	0,46
	Industrial Operations (Ethylene and PE)	0,76
		1,22
Total Kg CO₂ uptake&emissions		-3,09

The table shows the total carbon footprint of Green PE up to transport to Orsing, Sweden.

Source: Braskem

Sustainable all the way

Since plastic litter is such an enormous problem across the globe, Orsing wants to make sure that their sugarcane-plastic has a green end. When bio-based products are recycled at the end of their life cycle, the same amount carbon dioxide that was captured during the sugarcane cultivation process is released. This keeps the carbon in the system and the carbon footprint decreases.

When taking the necessary steps towards a more sustainable future, it is important that future plastic materials are made from renewable raw materials. In addition to the production of the completely fossil free aspirator tube, the increased awareness of the environment at Orsing has led to improvements in the material used in the packaging of different products. Hygoformic Bio and Bio Adaptor are packed in Biodolomer[®], an innovative fully industrial compostable and biodegradable bioplastic certified according to EN13432 European standard. Biodolomer[®] is made of calcium carbonate, sugar cane, rape seed and biodegradable PBS.

SHORT FACTS GREEN PE

- One hectare of land (a soccer field) gives approximately 82.5 tonnes of sugarcane
- 82.5 tonnes of sugarcane gives 7200 liters of ethanol which produces three tonnes of Green PE
- Three tonnes Green PE provides 1.2 million Hygovac Bio or 1.5 million short Hygovac Bio
- Compare this to the use of fossil resources where 250 ml oil is required to make a one-liter water bottle
- 200,000 tonnes of Green PE are produced in Brazil each year
- Sugarcane ethanol production currently occupies 4.6 million hectares of farmland, which is only around 1.5% of Brazil's arable land
- Green PE saves 80% CO₂ compared to regular plastic
- Green PE is both renewable and recyclable
- One ton Green PE captures 3.09 kilos of CO₂ for each kilo produced leaving a carbon footprint closer to zero
- Sugarcane can help restore the soil around its plantation

Source: Censo IBGE 2006 & UNICA & Braskem



SHORT FACTS BAMBOO

- **It is an ecological resource:** Preserves the ecological balance of the planet
- Does not require pesticides or herbicides thanks to its natural antifungal and antibacterial characteristics
- **Reduces deforestation:** 1 hectare of giant bamboo saves 20 hectares of forest
- One hectare produces up to 100 tons of usable biomass - 20 hectares of forest should be cut to get the same amount of wood!
- **Consolidates the subsoil:** 30 cm of roots are enough for the bamboo to develop
- The apparatus of roots of bamboo, formed by rhizomes and rootlets, is ideal for slopes consolidation and reforestation. It prevents landslides AND does not weigh down the ground with concentrated loads
- **Holds water:** Prevents soil washing away
- Bamboo has an excellent ability to retain water, preventing the washing away of land in case of heavy rain and thus avoiding dangerous swelling of streams and rivers. This ability also allows the plant to withstand long periods of drought.
- **Contrasts the greenhouse effect:** Absorbs 17 tons of carbon dioxide per hectare per year
- The Giant Bamboo plants absorb about 5 times the amount of carbon dioxide and produce about 35% more oxygen, at equal proportions, compared to a forest of trees, thus reducing the gases responsible for the greenhouse effect
- **Ideal for environmental decontamination:** Controls soil and air pollution
- Bamboo is an environmentally friendly and safe resource, capable of growing even on degraded and contaminated soils, so it is ideal for environmental decontamination
- **Processes and absorbs the nitrates of the subsoil:** Transforms pollutants, including nitrogen and heavy metals, in biomass
- Thanks to these unique features, bamboo helps to keep the waters of rivers and lakes clean and safe.

Source: Alma Consulting Srl

How are Hygovac[®] Bio and Hygoformic[®] Bio produced?



Sugarcanes capture CO₂ from the atmosphere



Fermentation and distillation create bioethanol. The ethanol is used to create Green PE (Biobased polyethylene)



Green PE is converted into the final product (Hygovac Bio and Hygoformic Bio)



The product is used in the dental clinic



Recycled as biomedical hazardous waste (incineration)



Green PE is 100% recyclable. When the product is burned, it releases the same amount of CO₂ back to the atmosphere, keeping the carbon in the system.

Q&A:

Carbon Footprint: The total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product. A carbon footprint is measured in tonnes of carbon dioxide equivalent (tCO₂e).

Renewable: Comes from nature and naturally restores or replenishes itself. It is constantly available without human or other outside influences. Sugar cane and bamboo are renewable resources.

Recyclable: Can be reused, transformed into a new item. A recyclable resource is one that can be used over and over but must first go through a process to prepare it for re-use. The process can be human-driven or naturally occurring. Glass and aluminium are examples of recyclable resources. Water can be considered a recyclable resource since it must go through the process of precipitation and evaporation in order to be reused. In addition, water can also be renewable in the form of hydroelectric energy. A waste-to-energy power plant combusts wastes such as Green PE and bamboo into electricity.

Biodegradable: Capable of undergoing biological anaerobic or aerobic degradation leading to the production of CO₂, H₂O, methane, biomass, and mineral salts, depending on the environmental conditions of the process. An important role in biodegradation is played by microorganisms, which are present in the environment and fed mostly by organic waste. However, unlike compostable, the term biodegradable means very little as everything is biodegradable given time. Thus, it is very important to specify the environment where biodegradation is intended to take place.

Compostable: Capable of breaking down by microbial digestion to create compost. Compost has many beneficial uses including improving and fertilizing soil. To go through a composting process, organic waste requires the right level of heat, water, and oxygen. In a pile of organic waste, there are millions of tiny microbes that consume the waste, transforming the organic materials into compost. In order to claim that a product is fully compostable, the product has to meet all the requirements in the European Norm EN 13432 and/or the US Standard ASTM D6400. Both specifications require that biodegradable/compostable products completely decompose in a composting setting in a specific time frame, leaving no harmful residues behind.

So why are Orsing's bio products renewable and not recyclable/biodegradable/compostable? Dental clinic wastes such as saliva ejectors and disposable mouth rinse cups that have been produced in the course of treating a patient are generally considered as biomedical hazardous wastes. Regulations differ from one country to another but due to their quantity, concentration and biological properties these wastes require special handling, most commonly disposal by incineration. There is therefore no value in producing recyclable/biodegradable/compostable saliva ejectors and cups while renewable materials with a carbon footprint close to 0 have tangible environmental advantages.

Sources:

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