ENVIRONMENTAL IMPACT

vegware™

Vegware is the ideal packaging partner to realise your sustainability ambitions.

- ✓ Plant-based materials
- ✓ Compostable products
- ✓ Recycled content (Over 3,400 tonnes used in 2019)
- ✗ **NO** conventional plastics or blends such as PSM
- ✗ **NO** oxo-degradable plastics

BIODEGRADABLE VS COMPOSTABLE

The term **'BIODEGRADABLE'** tells us nothing about where or how fast something can biodegrade. Wood is biodegradable, but a log cabin can stand for generations.

- Does it biodegrade in 200 years in the Sahara? In 1 day in the arctic?
- Example: PSM cutlery is sold as 'biodegradable' but contains 20-30% polypropylene, therefore it can only go to incineration or landfill.

If packaging can biodegrade in under 12 weeks in commercial composting, then it can be called... **COMPOSTABLE**.

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MADE FROM PLANTS

Vegware plant-based catering disposables are made from renewable, lower carbon, recycled or re-claimed materials, and can be composted along with food waste.

Once taken to composting, it will break down in a commercial composting facility in less than 12 weeks.

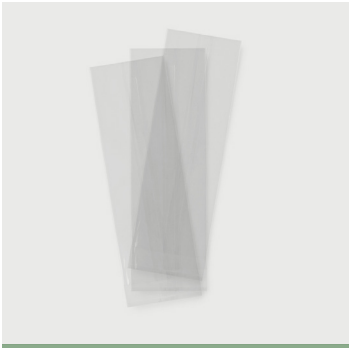
Talk to us about the best solution for your food and packaging waste - www.vegware.com

PAPER & CARD

Sustainably sourced, using recycled content where we can.

PLA & CPLA

Strong & light. Plant-based. Clear PLA for cold use, CPLA for hot.



NATUREFLEX

Clear film made from wood pulp. Anti-grease, heat sealable.

BAGASSE

Reclaimed sugarcane. Sturdy & practical, for hot and cold use.

PALM LEAF

Fallen, pressed Areca leaves. Unique eco style.

INKS

Vegetable or water-based, with a great print finish.

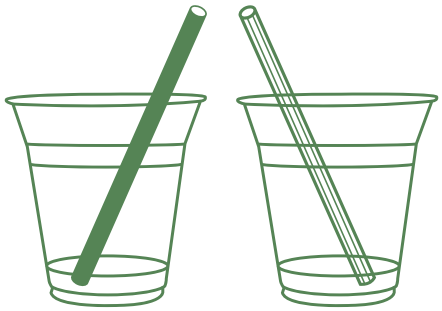
STRAW POLICY IN ENGLAND

The Environmental Protection
(Plastic Straws, Cotton Buds and Stirrers)
(England) Regulations 2020

April 2020

SUMMARY

- From October 2020 caterers can only supply plastic straws on request
- This includes bioplastic straws like Vegware's PLA and ecovio products
- Paper straws are unaffected by the new legislation



Are there exceptions?

Yes! Plastic straws will remain accessible for medical and accessibility purposes. It will be legal to provide straws in a care home, premises used for early years provision, schools and all detention facilities too.

Paper straws

Looking for an alternative? Vegware paper straws are premium quality and food safe, keeping carbonated drinks fizzy for longer. Made in the UK from 100% paper, and exempt from the new legislation.

Does this apply to Vegware's PLA and ecovio straws?

Yes. The draft legislation includes all manufactured polymers. This includes plant-based compostable materials such as PLA or ecovio.

When does it come into force?

Previously planned for April 2020, the new legislation will come into force in October 2020.

New sipping lid

In 2020 Vegware will launch a clear PLA lid with a raised sipping section which reduces the need for a straw.

What about Scotland, Wales and Northern Ireland?

At present there is no legislation in Scotland or Northern Ireland regulating the sale or distribution of plastic straws.

In early 2021, Wales will ban plastic straws, stirrers, plates and cutlery, as well as expanded polystyrene food and drinks containers and oxo-degradable plastics.

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The EU Single Use Plastics Directive

WHAT IS IT?

New far-reaching EU guidance aimed at reducing plastic marine pollution. It is based on the 10 single-use plastic items and fishing gear which account for 70% of marine litter in Europe.

> "The European Strategy for Plastics is a step towards establishing a circular economy in which the design and production of plastics and plastic products fully respect re-use, repair and recycling needs and in which more sustainable materials are developed and promoted."

WHAT IS GOING TO BE BANNED?

OXO-DEGRADABLE PLASTICS

Common in cold cups, cutlery, straws, and carrier bags, and often labelled 'degradable' or mis-sold as 'biodegradable'. These are conventional plastics with an additive to make it fragment into small flakes, but are not suitable for recycling or composting.

EXPANDED POLYSTYRENE

Food and drink containers – also known as Styrofoam. Very common material in cups, clamshells, plates and bowls.

All PLASTIC CUTLERY, PLATES, STIRRERS and STRAWS

That includes plant-based and compostable plastics, as the Directive is based on how materials behave in the marine environment. Compostable packaging breaks down in commercial composting conditions which provide a perfect balance of microbes, moisture and warmth; these are different conditions to the sea.

WHEN DOES IT COME INTO FORCE?

2021 at the earliest, with different deadlines to achieve various goals. Agreed upon in 2019, EU member states have two years to put the legislation into their own national laws. In England, plastic drink stirrers will be totally banned from April 2020 and there will be restrictions on plastic straw availability. Scottish and Welsh governments look to consider similar measures.

DOES IT APPLY TO VEGWARE?

	CANNOT SELL	CAN SELL	PAY HIGHER EPR*
CPLA CUTLERY	✓		
RCPLA CUTLERY	✓		
WOODEN CUTLERY		✓	
PLA STRAWS	✓		
ECOVIO STRAWS	✓		
PAPER STRAWS		✓	
BEVERAGE CUPS		✓	✓
LIGHTWEIGHT CARRIER BAGS		✓	✓
FOOD CONTAINERS including salad boxes, sandwich wedges & fast-food packaging for fresh or processed food that does not need further preparation.		✓	✓

*Extended Producer Responsibility - all packaging manufacturers, including Vegware, will pay more towards waste management and raising awareness.

REUSABLES PLUS VEGWARE

Environmentalists advise greater reuse,
but acknowledge disposables have a place.

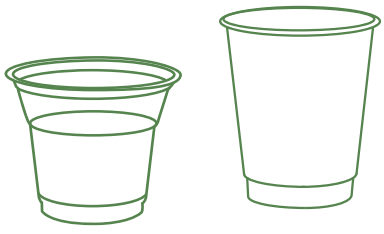
"A reuseable cup for your beer, but for your falafels, you should probably have Vegware."

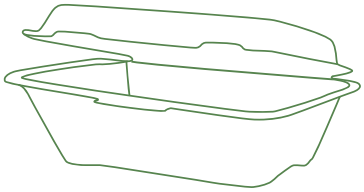
- according to Richard Dixon, chief executive of Friends of the Earth Scotland.

Many clients now offer a reusable option and use disposables for situations where reusables aren't practical.

With our expert environmental support and ever-growing trade access to composting, Vegware is uniquely placed to help clients achieve their waste ambitions.

Where composting isn't possible, our plant-based materials perform well in incineration, producing energy but no volatile gases; in landfill PLA remains inert and does not emit methane.





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ALL ABOUT PLA & CPLA

COMPOSTABLE BIOPLASTICS MADE FROM PLANT STARCHES

At Vegware, we manufacture our catering disposables from a variety of plant-based materials. We use paper, board and pulp, but the big difference is that we don't use conventional plastics.

Our cups still need to be leakproof, and our clients still want clear windows, so we use compostable bioplastics – compostable materials derived from plant sources.

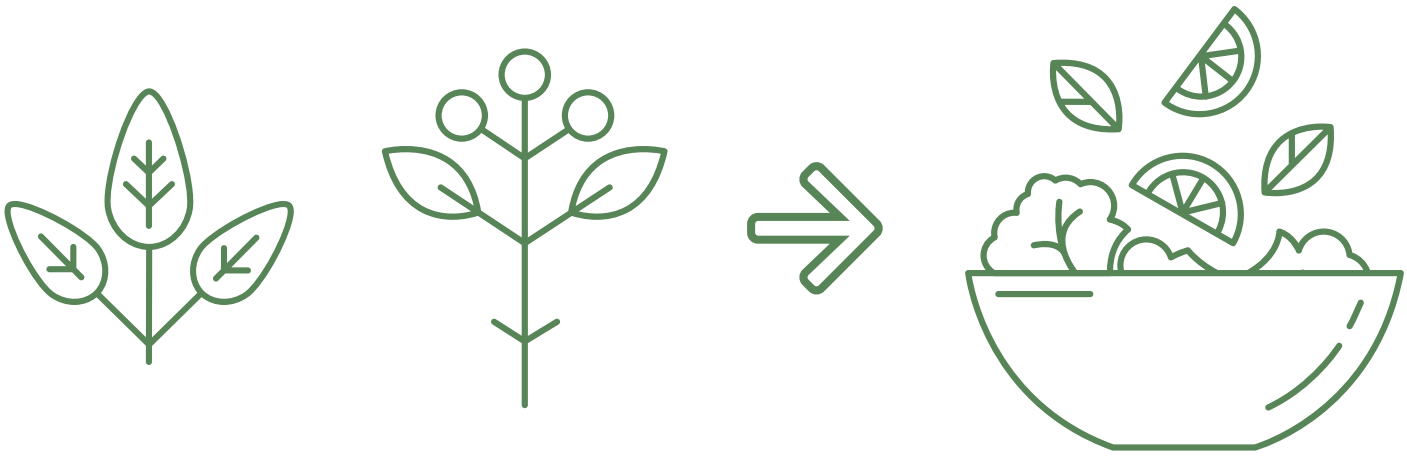
WHAT IS PLA?

PLA is a compostable bioplastic derived from plant sugars. PLA stands for polylactic acid. It can be made from any sugar, such as corn starch, cassava, sugar cane, or sugar beet. NatureWorks is the world's largest producer of PLA. Industrial corn is the primary source crop at the moment, but NatureWorks are working actively to diversify feedstocks, investigating other fibrous non-food crops, or even creating lactic acid from carbon dioxide or methane. NatureWorks refer to their PLA under the Ingeo brand, and offer full information online on how it is made, and end of life options.

HOW PLA IS MADE

Corn plants are milled to extract the starch, in the form of glucose. The glucose is then fermented to produce lactic acid. Next up, a chemical process transforms the lactic acid into a polymer, which can be made into pellets, known in the industry as resin. Just like a conventional plastic resin, the PLA pellets can be used in a variety of ways – extruded into a sheet or film, injection moulded, cast into sheets, or spun into fibres. PLA has a huge range of applications, but at Vegware we use it for:

- PLA-coated board for paper cups and soup containers
- Clear cold cups, salad containers, deli and portion pots, and lids for a variety of products
- Clear windows in sandwich wedges, salad boxes and bags



CPLA – CRYSTALLISED PLA FOR HIGHER HEAT USE

PLA has a low melt point, so it is best for cold food use. Where more heat resistance is needed such as in cutlery, or lids for coffee or soup, we use a crystallised form. This involves adding chalk to the PLA to act as a catalyst, and then rapidly heating and cooling the PLA resin during production. Vegware's CPLA products are still suitable for industrial composting, in either in-vessel or open windrow composting.

CORN FOR FOOD, FEED AND INDUSTRIAL USES

The industrial corn used to make NatureWorks Ingeo PLA is non-food-grade, so it is not competing with food for human consumption. The whole plant is harvested, and every part of it is used. The protein and starch have many different uses:

- the plant-based proteins are used to make animal feed;
- the starch has many industrial uses, including in airbags, corrugated cardboard, recycled paper, pharmaceuticals, condoms, oil refining and drilling…and making PLA.

Read more information on food and bioplastics from NatureWorks.

ENVIRONMENTAL BENEFITS OF PLA

There are environmental benefits of Vegware's PLA foodservice disposables on the production-side. NatureWorks shows that manufacturing PLA produces approximately **80% less greenhouse gases** and uses approximately **52% less non-renewable energy (NREU)** than traditional polymers like polystyrene.

Read NatureWorks' peer reviewed and published eco-profile for the complete data set.

From a cradle-to-gate perspective the Global Warming Potential (GWP) of PLA is confirmed is 500g CO2 per kg of PLA, which is roughly a **75% reduction in carbon footprint** versus most traditional plastics, shares PLA-producer Total Corbion PLA in their peer-reviewed report.

SUSTAINABLE GROWING PRACTICES

The corn plants are grown using sustainable farming practices, without excessive pesticides and water use. In the same way that FSC can prove the sustainability of timber production, NatureWorks has independent ISCC PLUS certification – more info here. This in-depth scheme demonstrates the sustainable growing practices for the plants used by NatureWorks to make PLA:

1. No sourcing from land with high biodiversity, high carbon stock or from peatland (2008 as the reference year).
2. Agricultural practices (fertilizer & pesticide use, storage, disposal, tillage practices, equipment calibration, irrigation)
3. Environmental protection (protect natural vegetation & water courses, soil erosion, soil organic matter)
4. Social sustainability (child labour, workers protection, labour condition, land rights, training, water rights)
5. Greenhouse gas emissions on farm level.

Implementing this scheme has involved helping farmers to alter their growing practices for greater sustainability.

PLA – WHICH WASTE STREAM?

Vegware's compostable catering disposables can biodegrade in under 12 weeks in commercial composting, which provides the perfect balance of microbes, moisture and warmth.

Where there is no access to industrial composting, used Vegware should be put in general waste. Vegware's takeaway packaging is made from plants, not plastic, using lower carbon, renewable or recycled materials, and these sustainability benefits still apply no matter what happens to them after use.

Used Vegware should NOT be placed in standard recycling bins which collect paper, plastics and metals, as those materials go to a different type of sorting facility. Another reason is that food waste harms the quality of mechanical recycling – the same applies to any used foodservice disposables.

General waste goes to either incineration or landfill. If Vegware is incinerated, energy is produced. Incineration studies from NatureWorks, a key materials supplier of ours, show that their PLA bioplastic produces more heat than newspaper, wood or food waste; also that it produces no volatile gases and leaves little residue. Some in the waste sector prefer plant-based materials over conventional plastics as they give off fewer toxic gases.

In landfill, studies have shown that compostable packaging is inert and does not give off methane.

Please do not litter – compostable packaging is not expected to break down when discarded in the environment, and is not a solution to marine pollution.

Home composting conditions vary with the skill of the householder, so we don't make any claims there, but there have been successful trials using hot compost bins.

PLA – NOT A THREAT TO PLASTICS RECYCLING

Compared to conventional plastics, bioplastics currently represent a tiny fraction of packaging, so it is not currently economical to sort PLA from other waste streams. If there is a major increase in bioplastics volumes, then waste sorting facilities can be calibrated to recognise and sort bioplastics using near-infrared identification. As well as composting, PLA is suitable for mechanical recycling into new PLA, as practised by Looplife Polymers in Belgium.

Studies have shown that low levels of bioplastics do not harm plastics recycling. German and Italian researchers have found there was no reduction to quality, up to these levels:

- Up to 3% PLA in post-consumer PP plastic recyclate (1)
- Up to 10% PLA in PS plastic re-granulates (1)
- Up to 1-2% PLA in recycled PET plastic short-spinning plant (2)
- Up to 10% MaterBi in the recycling of PE plastic shopping bags (2)

This information comes from (1) the report PLA in the Waste Stream, a report initiated by the German Ministry of Food and Agriculture. And (2) from CONAI, the National Packaging Consortium of Italy: Working Group Biodegradable Packaging Recovery Project report, 2012. We don't encourage anyone to put PLA into plastics recycling, but these studies offer comfort to plastics reprocessors, who are understandably keen to maintain quality.