



GLARE CONTROL FABRICS MANUFACTURED FROM PLANTS





M + N PROJECTEN

HAS DEVELOPED A NEW GENERATION OF GLARE CONTROL FABRICS
THAT LEAVE OTHER MATERIALS TRAILING BEHIND

REVOLUTION®

MADE FROM ANUALLY RENEWABLE MATERIALS INSTEAD OF OIL

HOW IS IT MADE?

REVOLUTION® IS MADE BY EXTRACTING SUGARS FROM PLANTS GROWN ANNUALLY. THESE SUGARS ARE CONVERTED INTO A REVOLUTIONARY MATERIAL, WHICH IS NOW BEING USED TO PRODUCE THESE ECOLOGICALLY ADVANCED GLARE CONTROL FABRICS.

CAN A NEW GLARE CONTROL FABRIC MAKE THE DIFFERENCE?

AT M + N PROJECTEN WE THINK IT CAN! WE SET OURSELVES THE CHALLENGE OF DEVELOPING GLARE CONTROL FABRICS OF THE HIGHEST QUALITY THAT SURPASSED OUR CURRENT SUSTAINABILITY REQUIREMENTS.

Technical accuracy and market insight into the client's requirements and wishes led to the development of a new generation of glare control fabric, made from renewable raw materials. Revolution® is not made from the standard polyesters used for conventional glare control fabrics but from Ingeo™, an ingenious new material that is 100% extracted from annually renewable vegetable raw materials rather than from oil.

Revolution® meets the same performance standards as polyester fabrics. It is very stable and durable. Less fossil fuels are also used in the production of the raw materials and less greenhouse gases are produced in comparison with the traditional polymers used for synthetic fibres.

WHAT IS THE DIFFERENCE?

“DID YOU KNOW THAT REPLACING 25,000 SQUARE METRES OF GLARE CONTROL FABRIC MADE FROM POLYESTER WITH EQUIVALENT 170 GSM MATERIAL MADE FROM INCEO™ FIBRE IS EQUAL TO THE FOLLOWING:

FOSSIL FUEL SAVINGS EQUIVALENT TO:

- » burning 3,837 litres of petrol
- » burning 1,096 gallons of gasoline
- » monthly electricity consumption by 81 residents in Western Europe
- » monthly electricity consumption by 35 residents of the U.S.
- » monthly electricity consumption by 55 residents of Australia/New Zealand
- » lighting a 100 watt bulb for 15 years
- » 27 barrels of oil a year

CO2 SAVINGS EQUIVALENT TO:

- » covering 55,941 kilometres in a new car in Western Europe
- » covering 22,475 miles in a new car in the U.S.
- » covering 43,719 kilometres in a new car in Australia/New Zealand
- » the consumption of 2 cars not driving for one year in the U.S.
- » the storage of carbon by 2 hectares of pine or fur forest for a year
- » the consumption of 342 propane cylinders used for home barbecues
- » the growing of 210 tree seedlings for 10 years

These reductions are estimates, and based on the “cradle to pellet” element of the life cycle. Ingeo™’s ecological profile and the available data on PET are applicable here. The calculations are based on all 170 grams per square metre PET being replaced by the same weight in Ingeo™ fibre and there being no changes to the ecological footprint associated with processing of the polymer to end product later in the production chain.

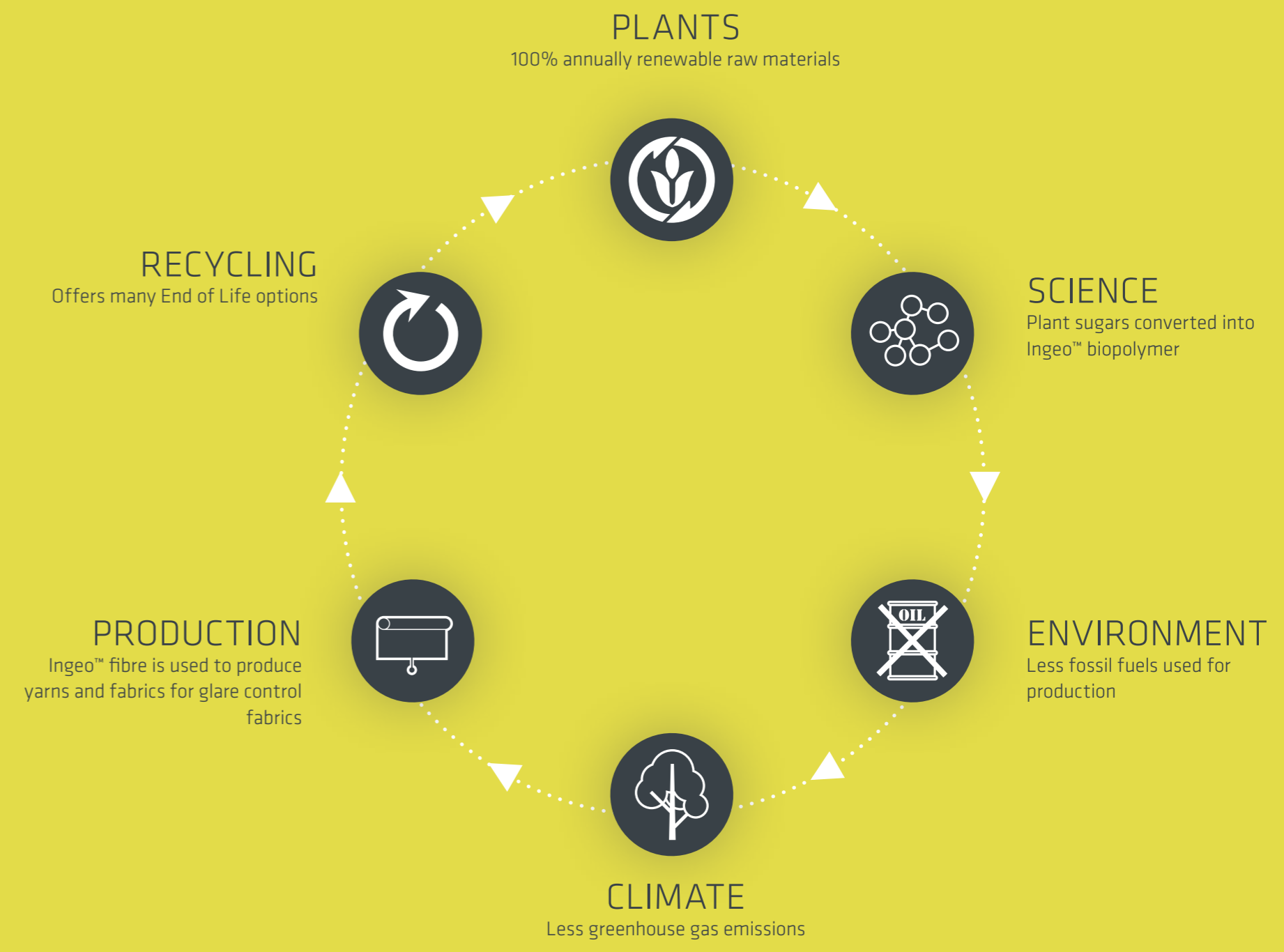




- » Revolution® is an innovation based on 100% annually renewable vegetable raw materials
- » Revolution® has outstanding light fastness
- » Revolution® glare control fabrics are certified by the STFI
- » Revolution® is durable and dimensionally stable
- » Revolution® meets the performance standards for polyester
- » Revolution® uses less fossil fuels from cradle to pellet
- » Revolution® causes less emissions of greenhouse gases during production*
- » Revolution® glare control fabrics contribute to carbon footprint reduction*

* In comparison with traditional polymers used for synthetic fibres





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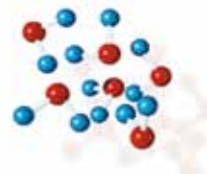
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INGEO BIOPOLYMER BEGINS WITH PLANTS

Ingeo™ biopolymers are made from plants. This Revolution® ary bioplastic is composed of long chains of polylactic acid made of natural sugars.



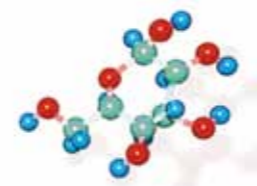
Carbon dioxide



Water



Sunlight



Glucose



Starch

- > Carbon dioxide is absorbed by the plant.
- > Water is absorbed by the plant, through the roots.
- > Sunlight is the energy source used by the plant to convert CO2 and water into sugar.
- > Glucose (sugar) is used as an energy source by the plant, and stored in the form of starch. This starch is the raw material for Ingeo™ bioplastic.
- > Oxygen is released during this process.

CONVERTING SUGAR INTO PLASTIC

The first step is converting the starch from the plant into sugars. These sugars are converted into lactic acid through a fermentation process (also used to make wine and beer). This lactic acid is then linked into long chains called polylactic acid. The polylactic acid is the bioplastic (plastic made from biological raw materials or plants). NatureWorks calls this bioplastic Ingeo™.

INNOVATIONS WITH INCEO™

The Ingeo™ bioplastic is converted into a fibre by our partners. This is then spun into a yarn that is used to weave the glare control fabrics (Revolution®). Subsequent processes ensure that the blinds meet high quality standards.



REVOLUTION® OFFERS DIVERSE RECYCLING OPTIONS

After the use phase, the glare control fabrics can be mechanically recycled. In mechanical recycling the plastic is processed back into pellets that can be re-used for a new application. Revolution® products can also be incinerated with energy recovery. This can be used to produce green electricity or steam, since the carbon in the material is from renewable raw materials.

If Revolution® ends up in a landfill site it will not break down, so the carbon will be stored in the landfill and a positive contribution will therefore be made to climate change. There is an End of Life Option to compost Ingeo™, but this is still being investigated in the case of Revolution®. The same is true of the chemical recycling route, through which the polymer is broken down into lactic acid again.



ENECO N.V. ROTTERDAM

Lettable floor space	30.000 m ²
Number of roller blinds (manual and electric)	± 1.500 stuks
Revolution® surface area	± 6.400 m ²





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