Panara

The company Panara was established in 2001
as a production and trading company of PE plastics films.

Since 2006 the company entered into the bioplastics area with the goal to develop biodegradable bio- based blends for different types of plastic processing.

Presented great results achieved by processing bio polymers PLA and PHA + other components were obtained thanks to the collaboration and partnership with the Slovak University of Technology, Faculty of Chemical and Food Technology and also thanks to powerful R&D and technical basement **CEPOMA** (Centre for Applied Research of Environmentally Friendly Polymeric Materials) located and operated in their headquarter in Nitra (Slovak Republic).
Last year, the installation of modern industrial lines was completed and initial operation started. Now we are launching industrial production with the aim of placing products on the European and world markets. The production capacity of the new plant is 4 - 7 thousand tons of semi-product (pelets)
New developed material is registered under trademark **NonOilen®**

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Panara

The vision and goals of the company

PANARA company wants to establish its product NonOilen® as an ecologically appropriate brand of bioplastic, which is respected by legislation and by public as well. The material will not be considered as plastics by the producers and consumers but as a natural material

PANARA wants to expand its activities to <u>every part of NonOilen® products' life cycle</u> especially by using closed chain of NonOilen® products (Closed Loop System), collection, recycling of used and damaged NonOilen® products and their disposal as a part of (NON-PLASTIC) organic waste

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NonOilen® meets the requirements for sustainability, which are:

- biodegradability (ability to degrade chemically into natural elements),
- recyclability
- right composability

Concurrently, mechanical and physical properties of **NonOilen®** products are comparable with standard (fossil) plastics.

Our goal is to introduce **NonOilen®** on the market as a class of ecological luxury in plastics field.

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Non- Oil- En®

no
fossil
environmet

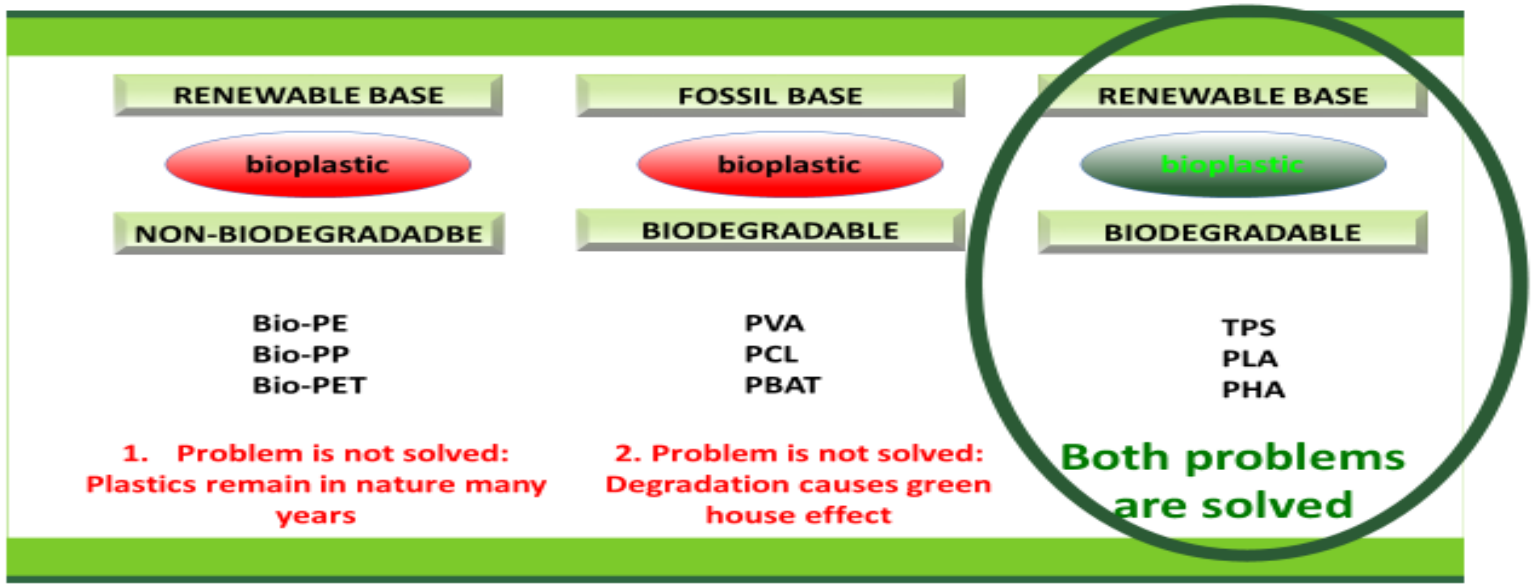
Blends for biodegradable bio-plastics based on PHA and PLA

Real Environmentally Friendly Bioplast

Bio-based • Biodegradable • Compostable • Biocompatible

PANARA JSC, Krškanská 21 , Nitra SLOVAKIA

The Solution **bioplastics**



From the perspective of a complete solution to the problems with plastic and plastic waste in connection with the protection of the environment is a forward-looking and sustainable **real alternative** in the production and the **use of biodegradable plastics** made **from renewable sources** of raw materials, to be able to degrade as well under conditions of controlled composting, as well as in the wild (land, water, sea water).

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Uniqueness

NonOilen® technology

worldwide unique technology **for processing of biopolymers (PLA,PHA)** into **multicomponent blends**

that respect current environmental requirements,

which are **able to reach mechanical, physical and technical properties comparable to fossil based materials used for plastics .**

Basic characteristics **:**

- Biobased
- Biodegradable
- Compostable
- Eco friendly

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Commercial and other benefits

BENEFITS OF MULTICOMPONENT BIODEGRADABLE BLENDS
Nonoilen ®:

1) Material based on blending of various components – PHA, PLA and other minor bio- based components,

2) Multicomponent material brings the possibility to create recipes for different final applications and customize them according to customer requirements

3) Nonoilen material may be processed on standard production lines used for plastics processing,

4) Strong ecological and social impact thanks to its innovative sustainability advancement.

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NonOilen®

Two categories of bio-based ecological polymeric blends

Category I

PLA
+
PHB, PHA
+
Plasticiser

Industrial compostability

Home compostability
(special grades)

Category II

PLA
+
PHB, PHA
+
TPS
+
Plasticisers

Industrial compostability

Home compostability

Biodegradation in soil
(special grades)

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Panara IP

IPR : **NonOilen® 1G**

Exclusive license granted from Slovak Academy Of Science
PANARA owns a territorial license for the EU, China, Singapore Japan , South Korea and Russia.

IPR : **NonOilen® 2G**

Panara has its **own solution** for the bio-based bioplastic NONOILEN blends which contain plasticised starch. In contrast to the previous solution these blends are able to degrade in **home compost, soil** and sea water too.
Currently, national patent granting phases is over in the USA, Canada, EU, Australia, New Zealand, Brazil, Chile, China, Hong Kong, Malaysia, Singapore, India

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Patended solution

Patended solution was presented and awarded by:

2021- Expo Dubaj

2019 – World Bio Markets exhibition Amsterdam– Nonoilen nominated in section Biostar for most innovative bio material

2018 – Slovak Ministry of the Environment – Nonoilen concept as the winner of the innovative waste management award

2017 –- Expo Astana

2015 – Expo Milano

2013 – Award for techtransfer in Slovakia – Innovation with the biggest potential for practical application

2012 – Gold medal Taipei International Show and Technomart

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R&D – key figures

- **prof. Pavel Alexy**
- **Head of R&D**

- **prof. Dušan Bakoš**
- Guarantor of natural polymers **research focused on tissue engineering**

- **Ján Bočkaj**
- **Main Technologist**

- **Katarína Tomanová**
- **Head of laboratories and testing center**

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The Shareholders , The 1st and 2nd investment round

The Founders
Miroslav Galamboš , Pavol Trúnek , later prof, Pavel Alexy

1st round May 2021

Financial Investors:
ALPLA Werke Alwin Lehner GmbH & Co KG
Lobos Invest GesmbH
Nawitas Development

2nd January 2023

Financial Investors:
H10 Holding GmbH,
Lobos Invest GesmbH,
Nawitas Development

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