



**ECOGEHR<sup>®</sup>**

Bio-based plastics

***Bio-plastic applications and  
obstacles in new markets***

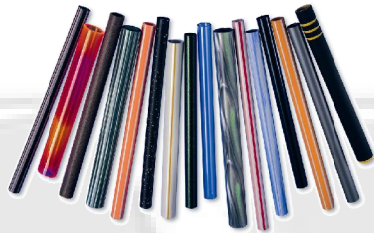
2011-03-04

# Why bio-based plastics at GEHR?

## Consumer goods:

- Request from Cosmetics and Writing instruments

*“What about a green tube for green consumer products?”*



- Benefit: ‘Green’ cosmetics/writing instruments in bio-based tubes
- Drawback: In the beginning the available materials did not fulfill the chemical specifications for these markets

# *Why bio-based plastics at GEHR?*

## **Stock shapes:**

Extrusion of tubes worked well

Why not also in stock shapes (rods, sheets, profiles)?

Initial idea:

- Stock-shapes for proto-typing
- Expand GEHR's stock-shape range
- Unique selling proposition
- Innovative + Future oriented

Disadvantages:

- Little to no technical data
- Confusion about bio-degradability for industrial applications
- Mechanical engineers were/are looking for technical features not for green products

➤ **Opportunity for GEHR to develop new markets**

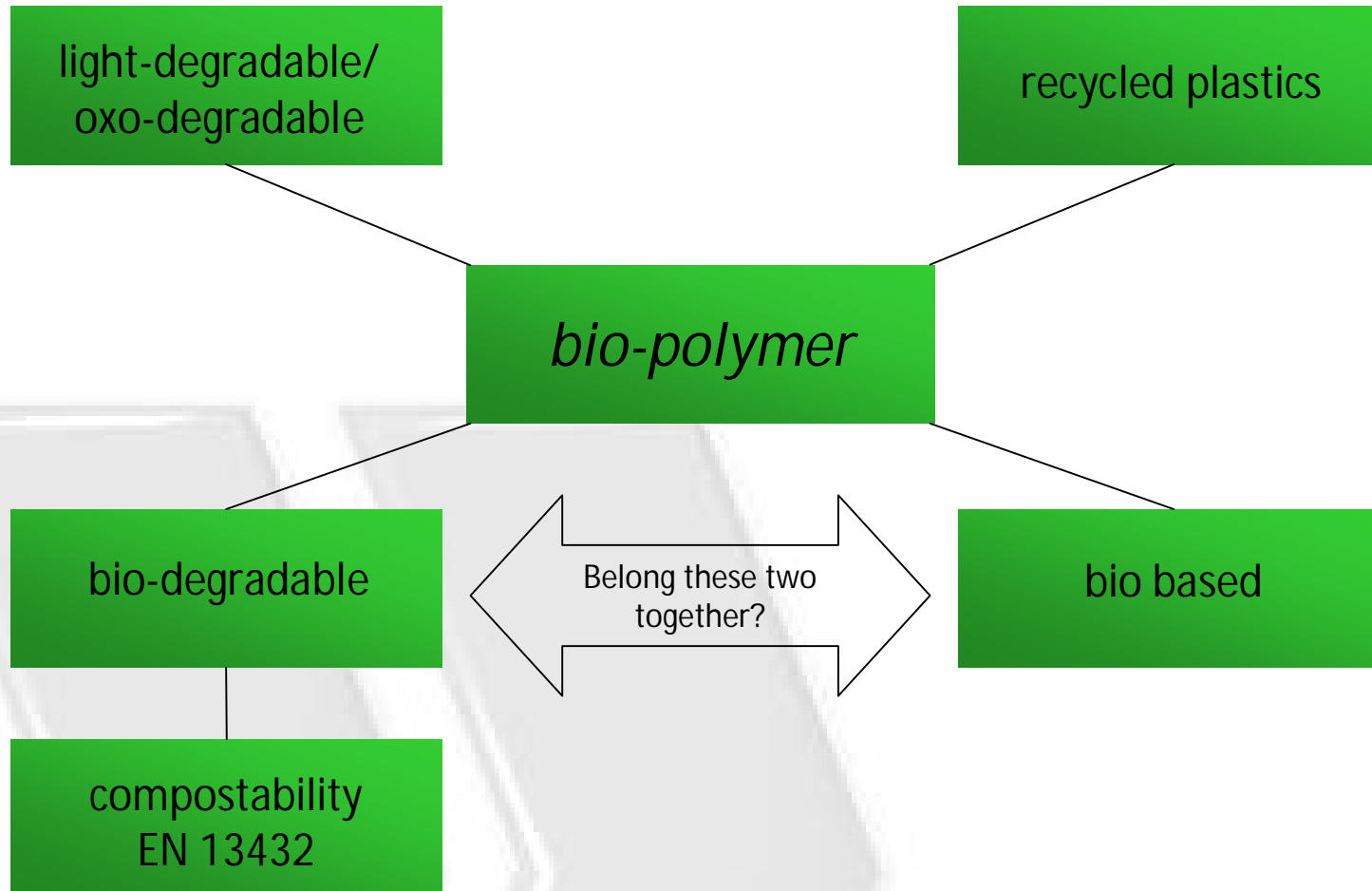
## ***Challenges for market entry***

- Understanding of bio-plastics?
- Wording to customers?
- Avoiding of ‚Greenwashing‘

# ***Definition by European Bioplastics***

- Plastics, that are based on renewable resources or that are biodegradable. They must fulfill all criteria of scientific accepted norms for certification of biodegradability and compostability of plastics (EN 13432).

# General overview



# ***Light-depending degradation/ oxo-depending degradation***

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- ~~Plastics split under the influence of solar radiation / oxygen into small pieces (due to additives). The mineralization of these small particles takes still a long period of time.~~
  - ~~Fragmentation but no real degradation takes place~~
  - ~~Danger of accumulation of micro-plastics in the environment~~

# Renewable resources

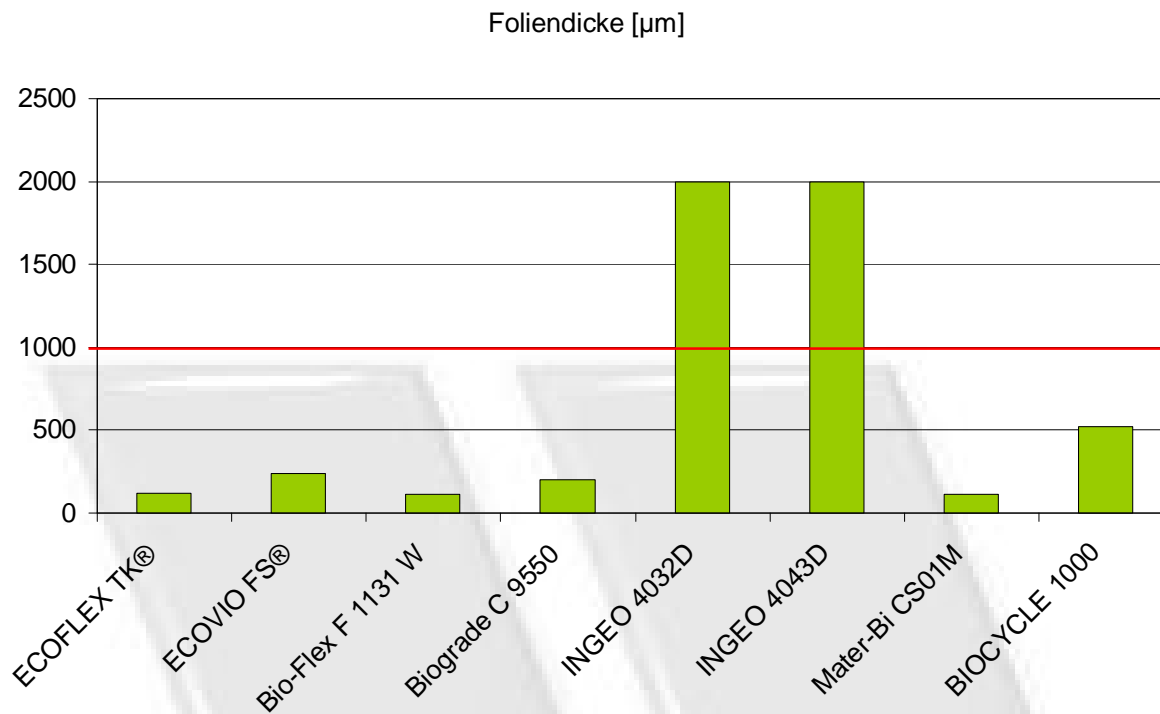


No competition with food is our target!

# Biodegradable/Compostable

- Under suitable environmental conditions (temperature, humidity, pH value), biodegradable materials can be broken down by micro-organisms such as bacteria and fungi..
- Currently biodegradation or compostability norms like EN 13432 (EU), ASTM D6400 (USA) and AS 4736 (Australia) are made for thin packaging foils (µm) (norm: 60-90 % material biodegraded in 12 weeks means compostable)

# Biodegradable/Compostable

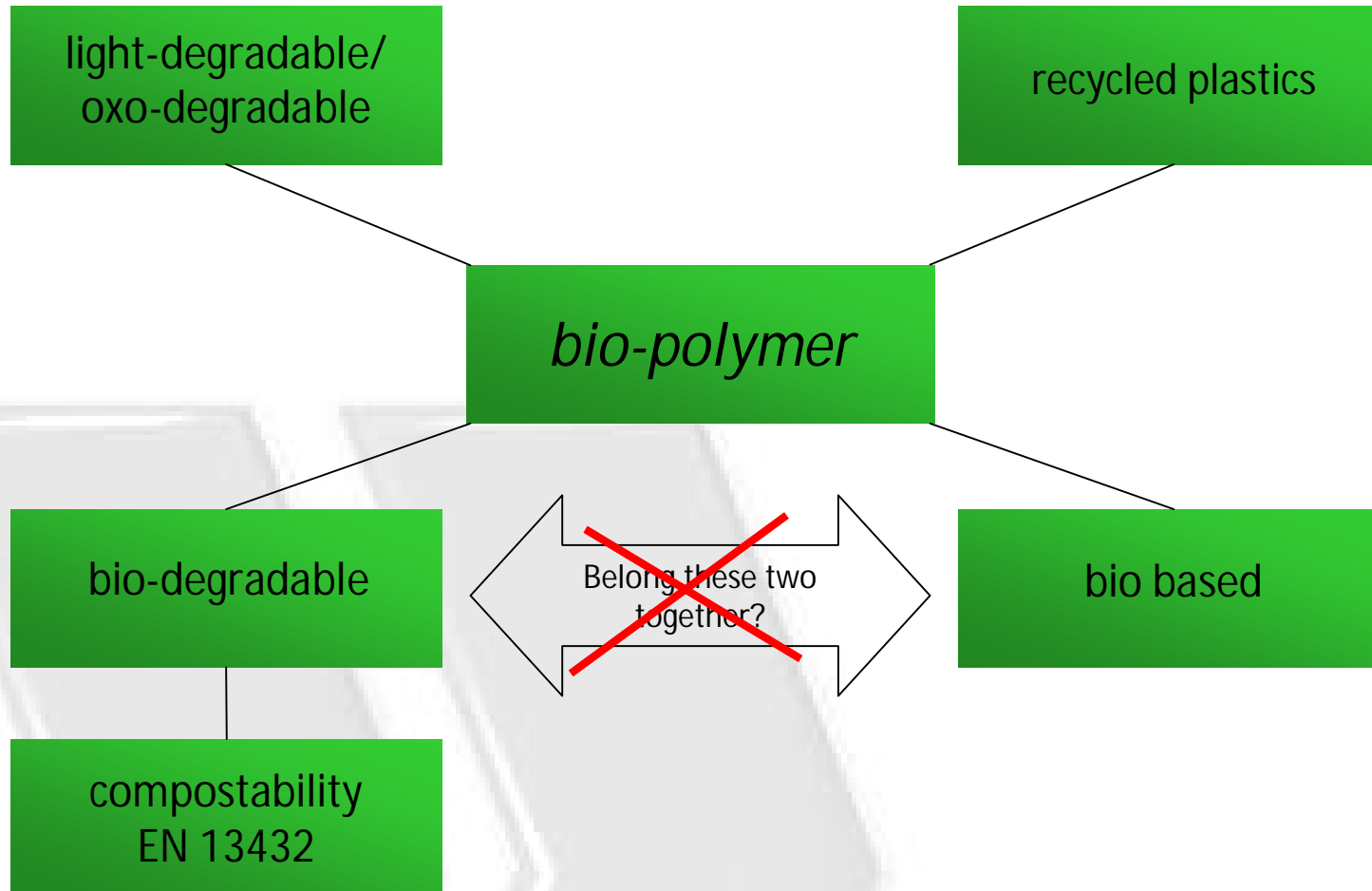


- Most semi-finished products are thicker than 1000 µm
- For most of our customers compost-ability is not important
- ECOGEHR-materials are mainly used in durable applications
- **Some of the resins represented in ECOGEHR are certified according DIN EN 13432 but not the semi-finished products**

# Self-conception of ECOGEHR

- Bio-based (in some cases biodegradable)
- At GEHR the renewable content is at least 45 %, mostly 70-100 % (common use of “bio” = 20 % renewable)
- **No** bio-polymers are:
  - Compostable Co-Polyesters based on crude oil
  - Polymers that degrade under light or oxygen influence (additives)
  - Recycled plastics

# Conclusion



# Where is **ECOGEHR**<sup>®</sup> placed compared to conventional plastics?

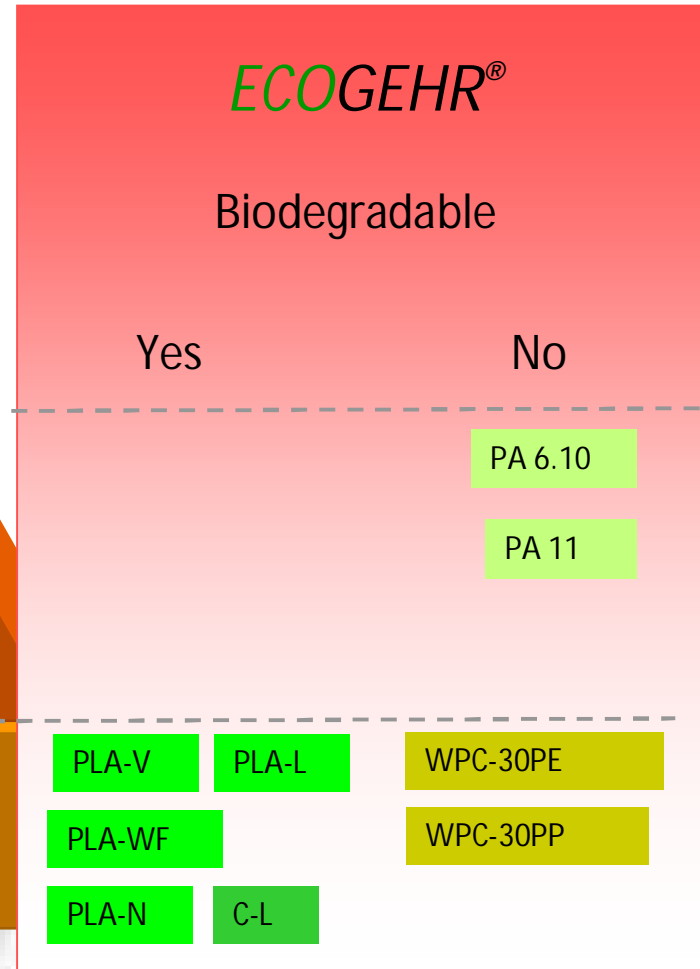
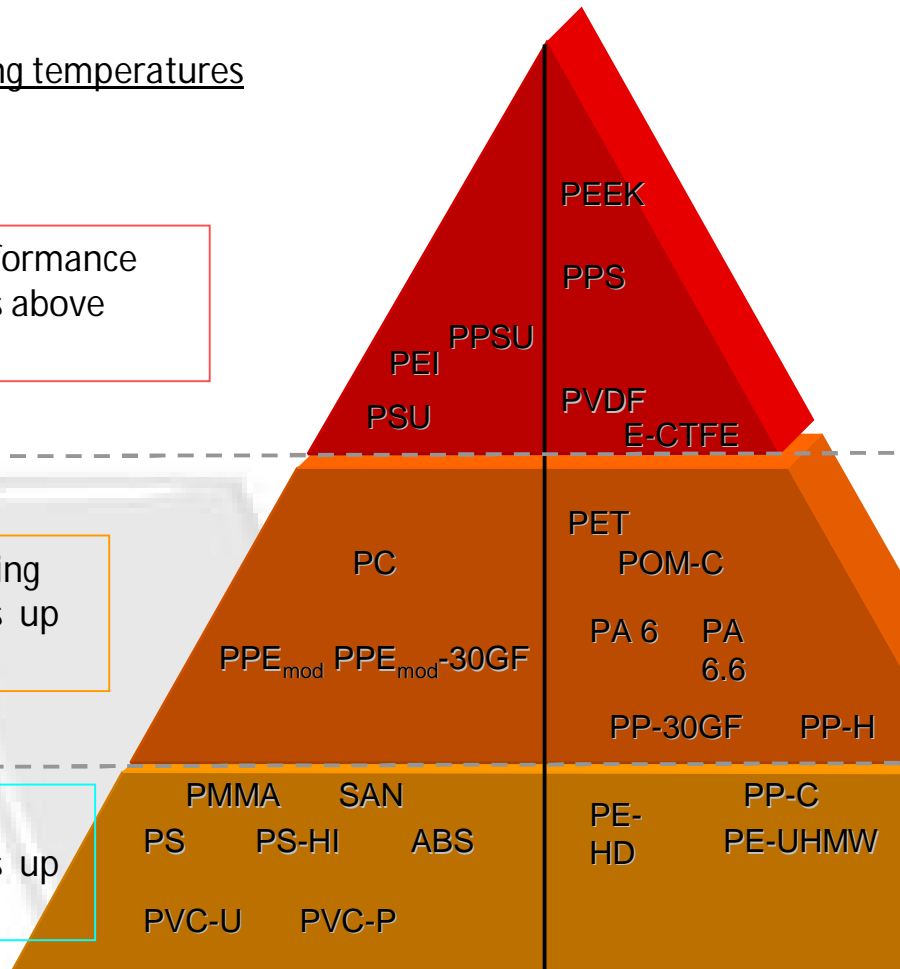


Operating temperatures

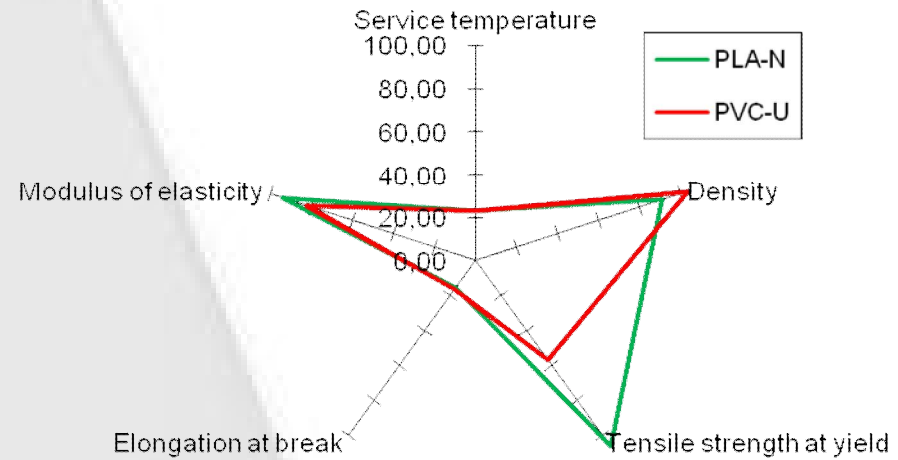
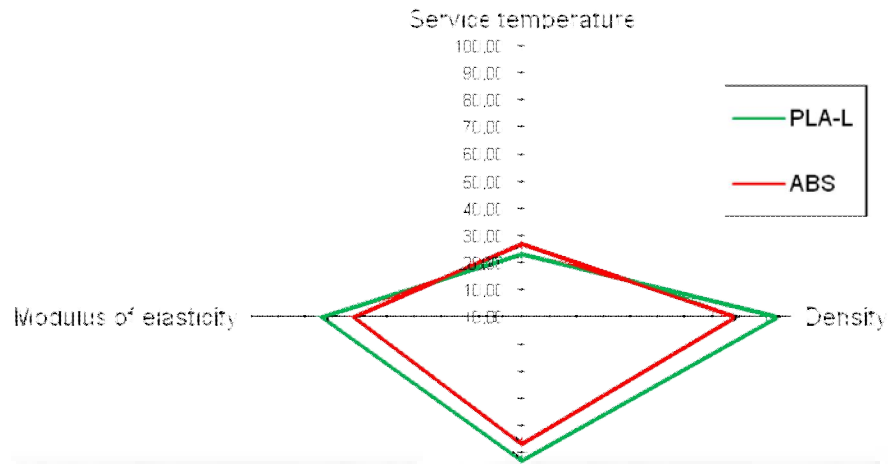
High Performance  
Polymers above  
140°C

Engineering  
Polymers up  
to 140°C

Standard  
Polymers up  
to 90°C



# Comparison of technical properties



# *Our portfolio*

**ECOGEHR**<sup>®</sup>  
Bio-based plastics

- Sheets
- Calendered Sheets
- Rods
- Tubes
- Profiles



# Applications: Machined Parts



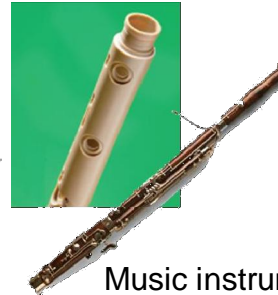
Mouthpieces  
for woodwinds



Wooden building blocks



Furniture



Music instruments



Shaving brush



Ladder rungs /  
Playgrounds



Rectangular  
tubes for park  
benches



Screw tip (to fix  
fence posts)



Engineering  
parts (cogwheels,  
parts for pumps)

## Target market: Signage

**Features: Thermo-formable, bendable, printable, glue able, available in different color (-> custom run)**



# Gratification for our engagement

**ECOGEHR**<sup>®</sup>  
Bio-based plastics



2008 **Bioplastics**  
Awards  
Best Bioplastics Processor

## Thank you for your kind attention!

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