



aquapak

## Bio Hydroxy Polymers – The Missing Link in Bioplastics

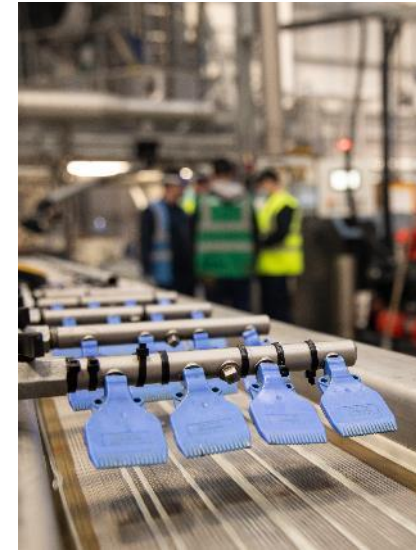
Mark Lapping, CEO on behalf of Dr John Williams, CTO



Global  
Commitment

# Aquapak Polymers

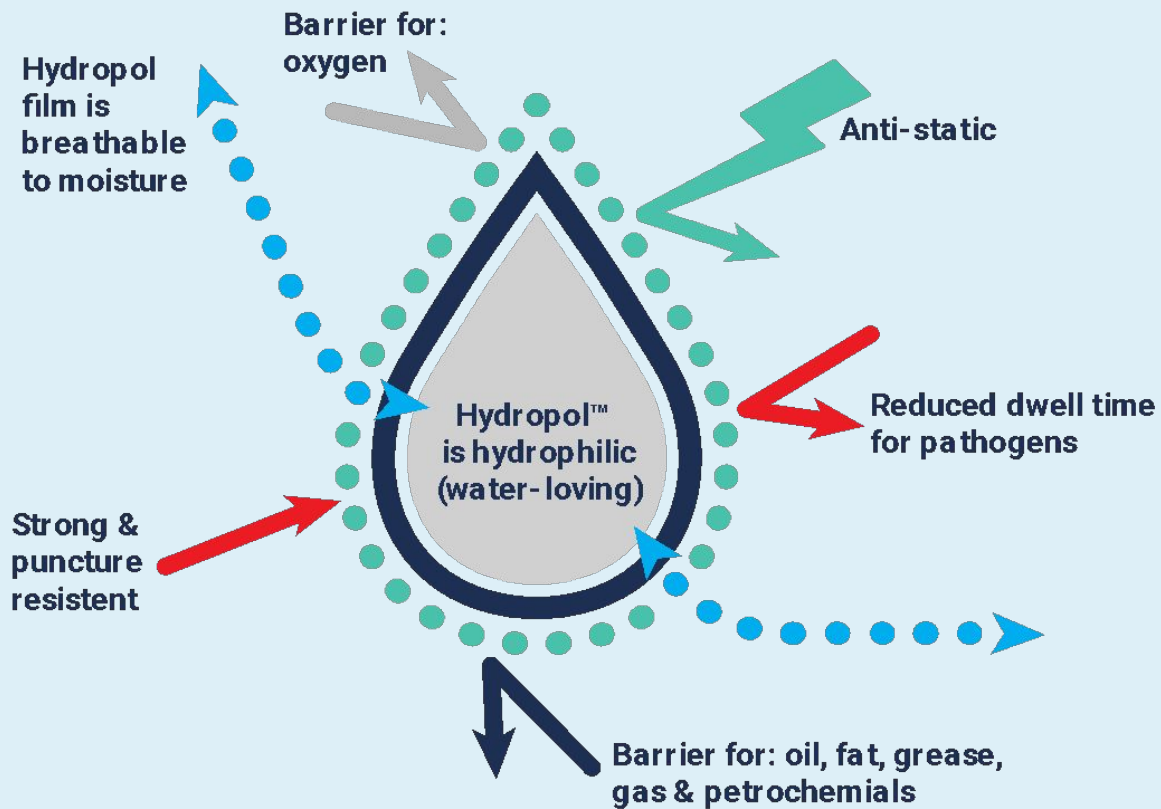
Experts in the manufacture of thermally processible Polyvinyl Alcohol



4700m<sup>2</sup> compounding  
facility in Birmingham,  
UK, currently with  
30,000MT capacity.  
ISO9001 certified.

# High functionality

Polymer technology that's 'cracked the code' on sustainable plastic to facilitate the circular economy



Tailored solubility

+



Biodegradable

=



Easier separation & recycling



Non-toxic & marine safe



Suitable for AD plants



Compostable

Low environmental impact

hydropol™

Enables multiple end of life options

Easier separation and recycling, compostability

Proven safe in paper mills & AD plants



hydropol™

Sustainable solutions  
for brands across the  
world



Hydropol allows for  
scalability of  
sustainable platforms

Suitable for diverse  
types of products

# Hydropol functionality

Plus end-of-life comparatives



Most innovative technology in the market

	Properties	Hydropol
Functionality	Thermo-processible	✓
	Hydrophillic	✓
	Water Soluble	✓
Raw Material Source	Petro Chemical (Bi-Product Used)	✓
	Bio Material	✓
End of Life Options	Biodegradable	✓
	Recyclable	✓
	Compostable	✓
	Dissolveable	✓
	Anaerobic Digestion	✓
	Landfill Biodegradable	✓

KEY:

Hydropol  
Thermo-processible Polyvinyl  
Alcohol (PVOH)

# Typical routes to bio PVOH

New routes to bio polyvinyl alcohol needed



Poly hydroxy polymers such as PVOH have advantageous properties both functionally and at end of life.

This can be seen in the current Hydropol products

The standard route to creating bio PVOH follows the petro process but uses bio VAM (vinyl acetate monomer) instead of petro.

However, to achieve this route requires scale and large capex



The route to bio  
Developing the bio hydroxy Hydropol family



Aquapak has developed a two stage process which is not reliant on VAM

This process is creating a family of bio hydroxy polymers

Made from biomass (existing bio platform monomers derived from non-food feedstock)

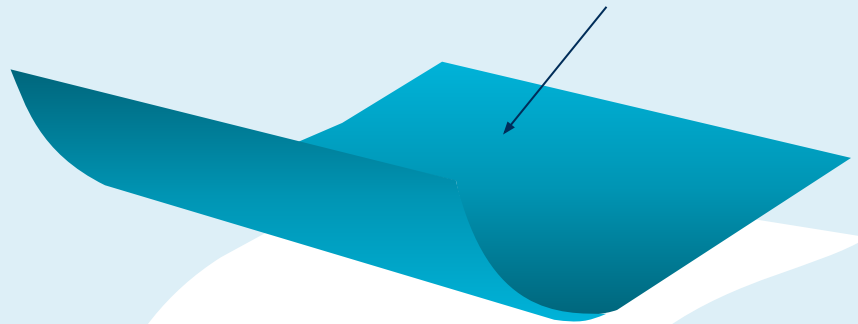


# New multi-functional bio hydroxy polymers

Combining high functional performance and multi end of life options including recycling and compostability



Aquapak's Bio Hydroxy Polymers



Cellulose and bioplastics

- ✓ Adds barrier properties and strength
- ✓ Enhances front end performance
- ✓ Adds clarity
- ✓ Multiple end of life properties including recyclability and compostability
- ✓ Excellent synergy with existing materials

Multi functional polymers

Offer high functional performance & multiple end of life options

Like Hydropol PVOH, they show excellent synergy with existing materials including cellulose and bioplastics

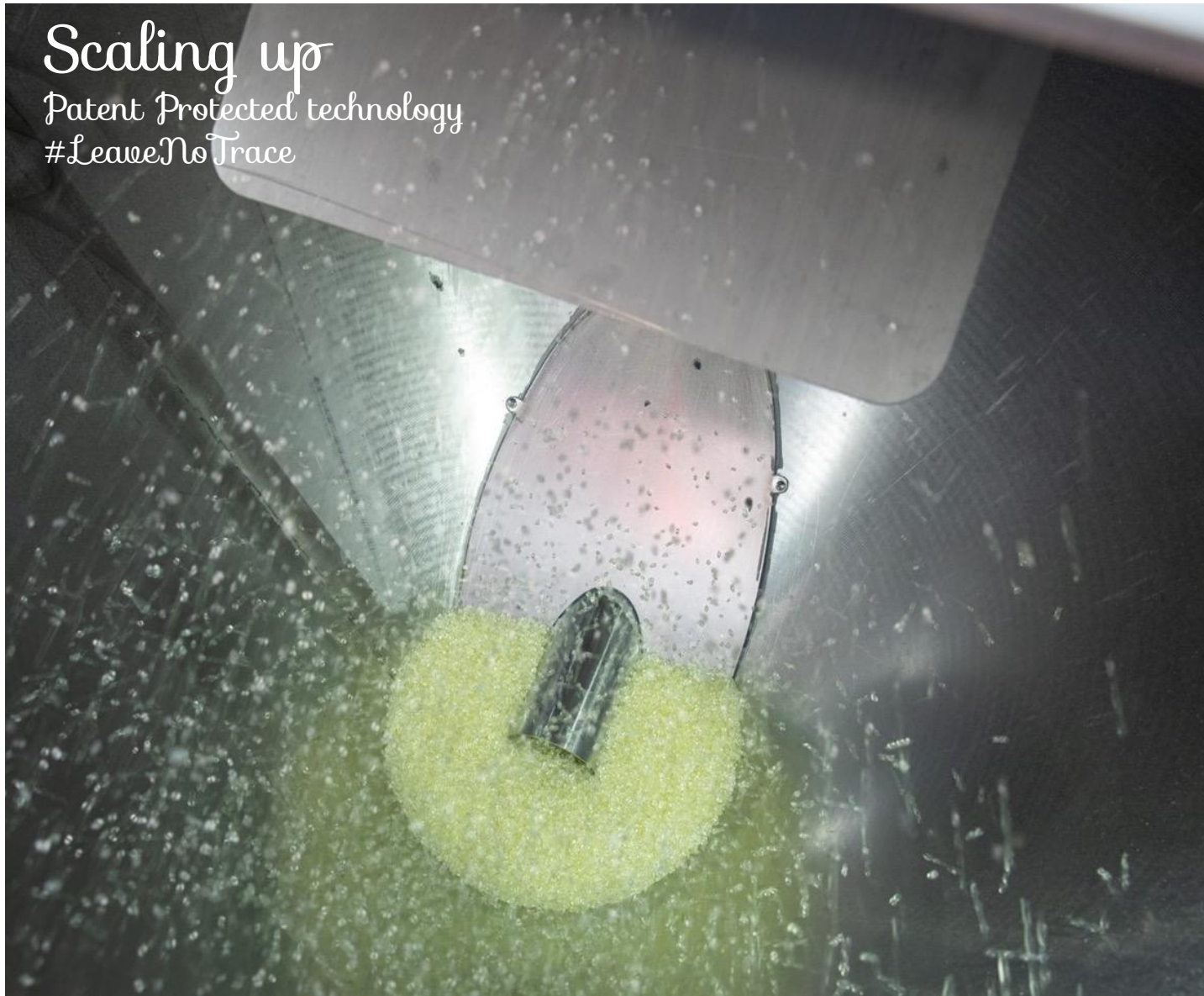
Enhance other materials in terms of front-end performance



# Scaling up

Patent Protected technology

#LeaveNoTrace



Aquapak has scaled the first target polymers to multi kg quantities

These are undergoing processing and performance trials prior to tonne scale up

Other polymers in the family will be available by end of 2023/early 2024 for similar testing

Hydropol bio is the sustainable, renewable missing link to the supply chain

# Dedicated R&D Capabilities

Extensive inhouse expertise + strategic partnerships

## Key Focus Areas



### Formulation

- Material combination and characterization
- IP generation



### Manufacturing Process

- Optimization and processing efficiency - design, throughput ability and stability
- Processes IP



### Application specific technology

- Focus on mechanical strength and barrier properties
- End-of-life optionality



### Data Collection

- Application optimization
- End-of-life data portfolio

## Strategic Partnerships with Institutions

### Research and Academia



### NGOs



Team of 23 technical experts with 12 dedicated to R&D - 6 have PhDs - lead by Dr. John Williams



2 full scale labs, pilot equipment and scaled application testing unit in-house

New capabilities unlocked and new solutions delivered



Thank you  
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Accelerating the transition to the Circular Economy



Global  
Commitment