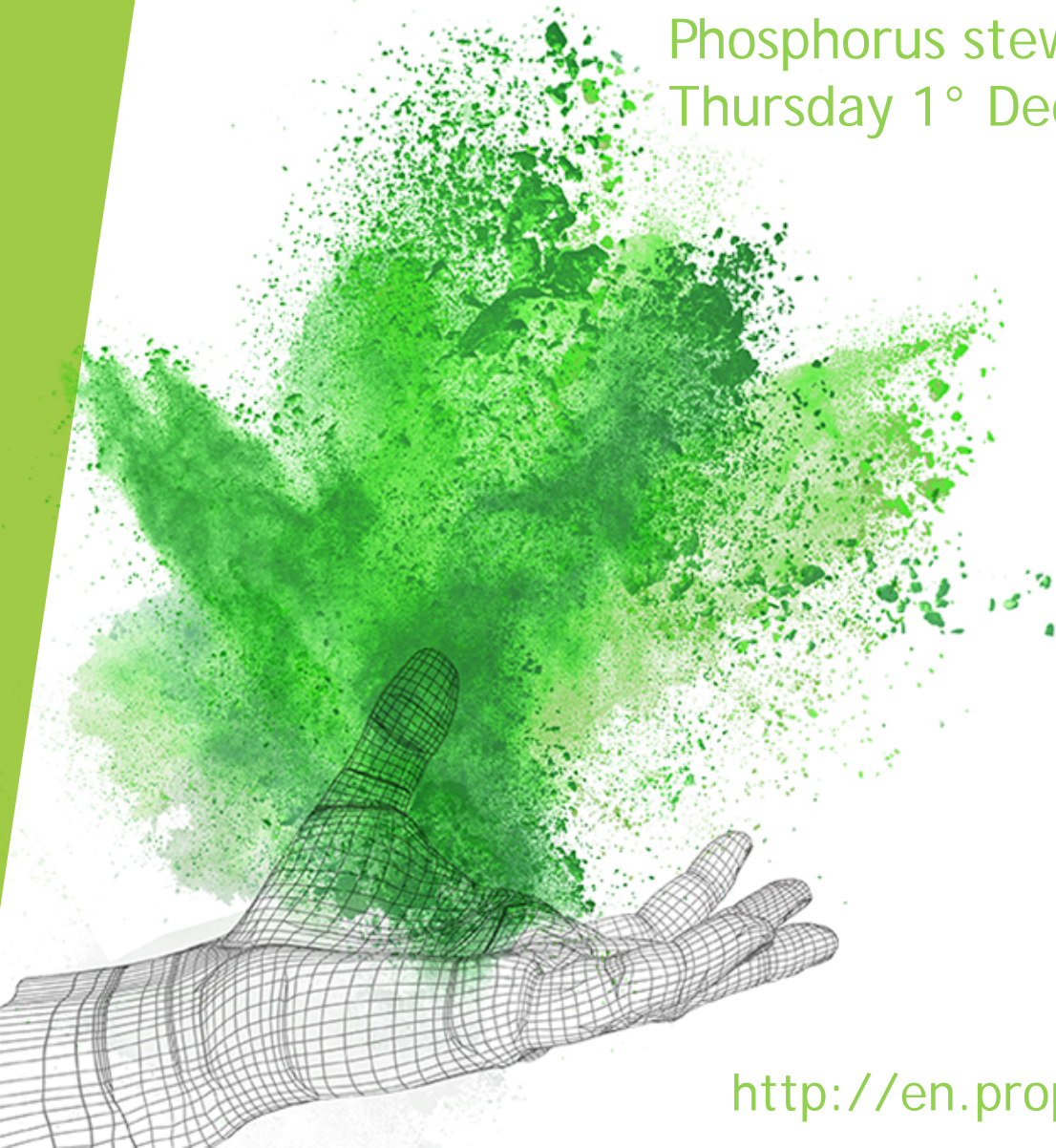


# ProPHOS Chemicals

Phosphorus stewardship in industrial applications  
Thursday 1° December, Brussels

Dott. Marco Michelotti

<http://en.prophoschemicals.com>



“Manufacturing organizations tend to attract attention the way airlines do: one only notices them when they are late, when ticket prices rise, or when they crash! When they are operating smoothly, they are almost invisible.”

Robert H. Hayes

Roger W. Schmenner

Harvard Business Review

# Our Vision

“We want to be a Green chemical company, which invests in research to develop innovative products and services, customized for the customer, while respecting the values of Sustainability and Ethics of Work.”





Innovative solution for phosphate recovery  
from exhausted extinguishing powders



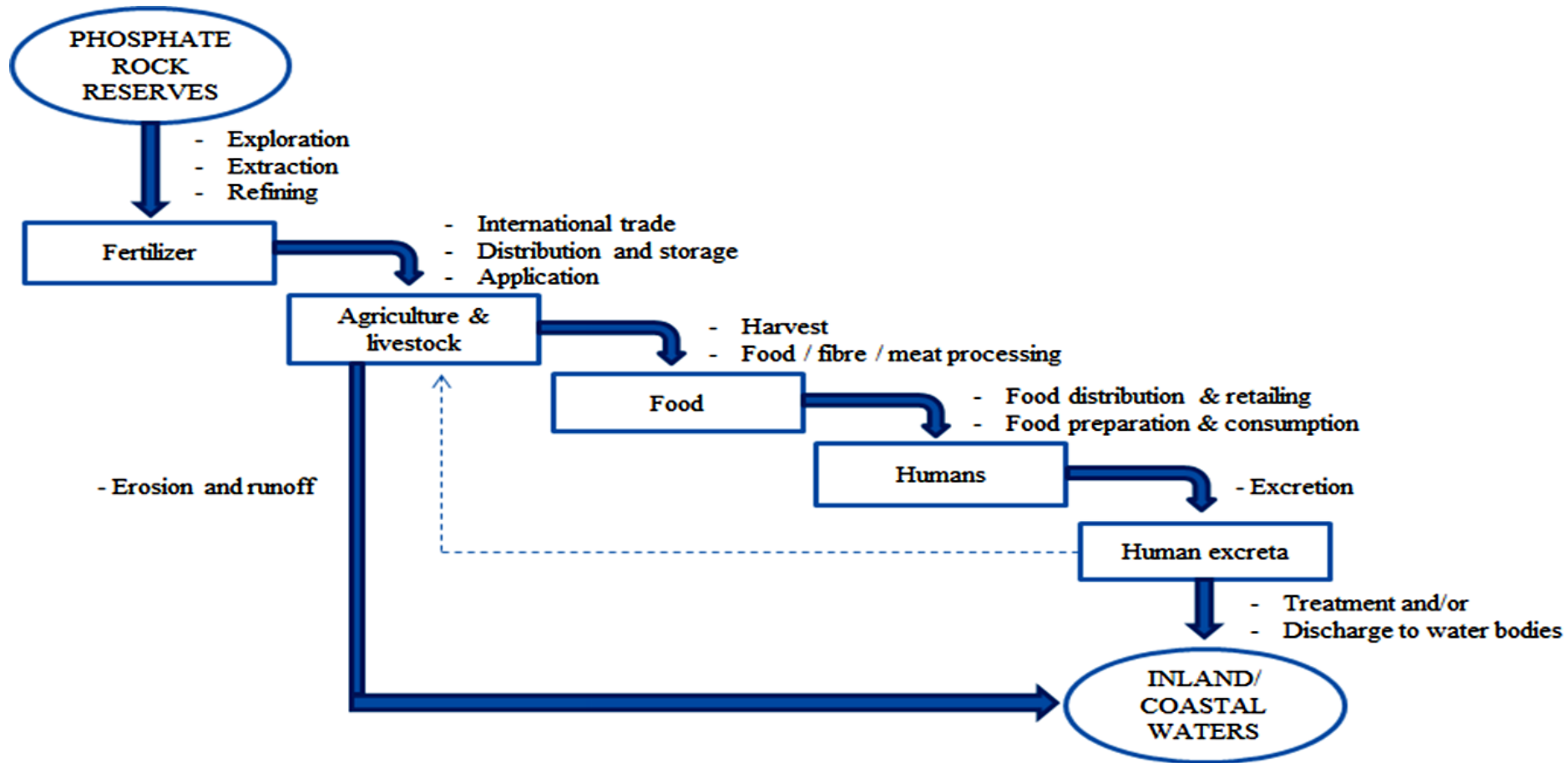
This project has received funding from the  
EU's Horizon 2020 research and innovation  
programme under Grant Agreement No -  
724586



## Objectives

- Developing *an innovative eco-compatible method for removing the silicon component* from exhausted extinguishing powders;
- Implementing *an industrial plant* for the treatment of this waste, recovering monoammonium phosphate;
- Obtaining *raw materials* for the formulation of *specialty fertilizers* for agricultural use, and for the production of *flame retardants* in the wood sector;
- Achieving further *environmental benefits* in term of reduced greenhouse gas emissions.

# PHOSPHORUS is essential to life!!!



The global phosphate demand is rising due to a growing world population and associated food demand, increasing the demand for phosphate fertilizers.

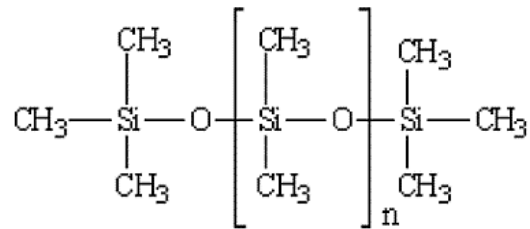
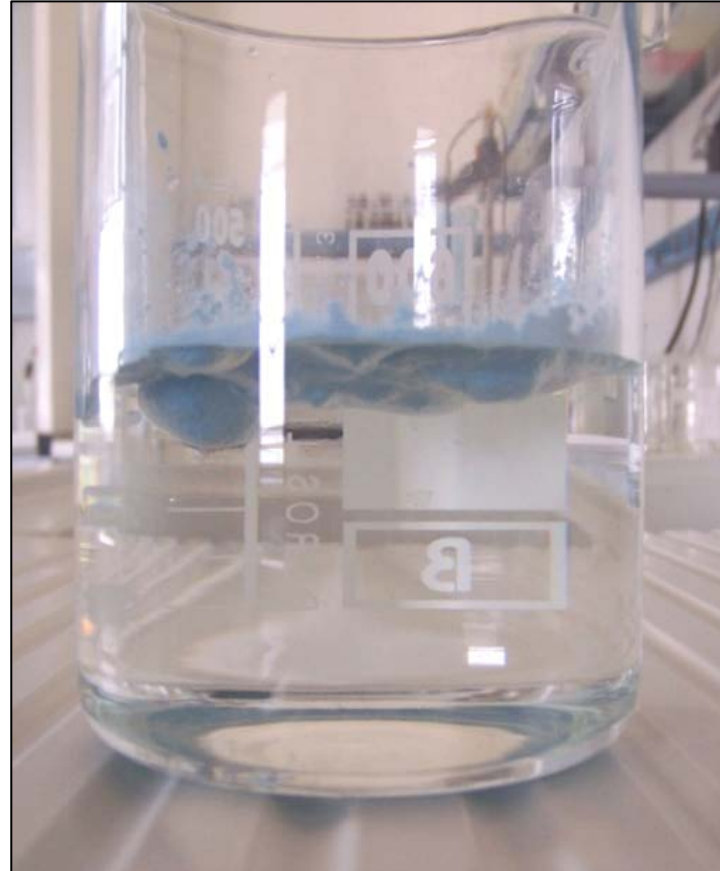
# Industrial Problem



Ammonium Sulfate



Monoammonium Phosphate



Silicone Oil

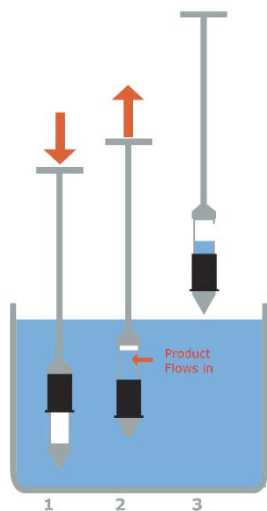
## ABC Extinguishing Powder

Monoammonium Phosphate	40,0 %
Ammonium Sulfate	55,0 %
Silicone Oil	< 0,5 %
Dyes	< 0,5 %
Additives	< 1,0 %



# Sampling and Analysis Protocol

Sampler



Moisture analyzer



Spectrum Two



Optima 8000

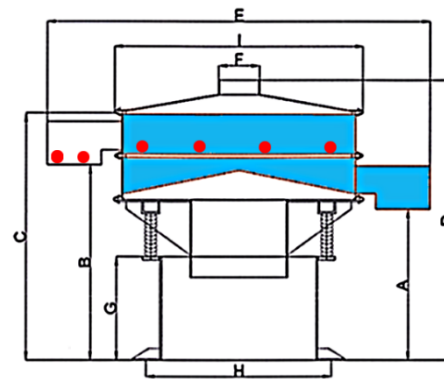
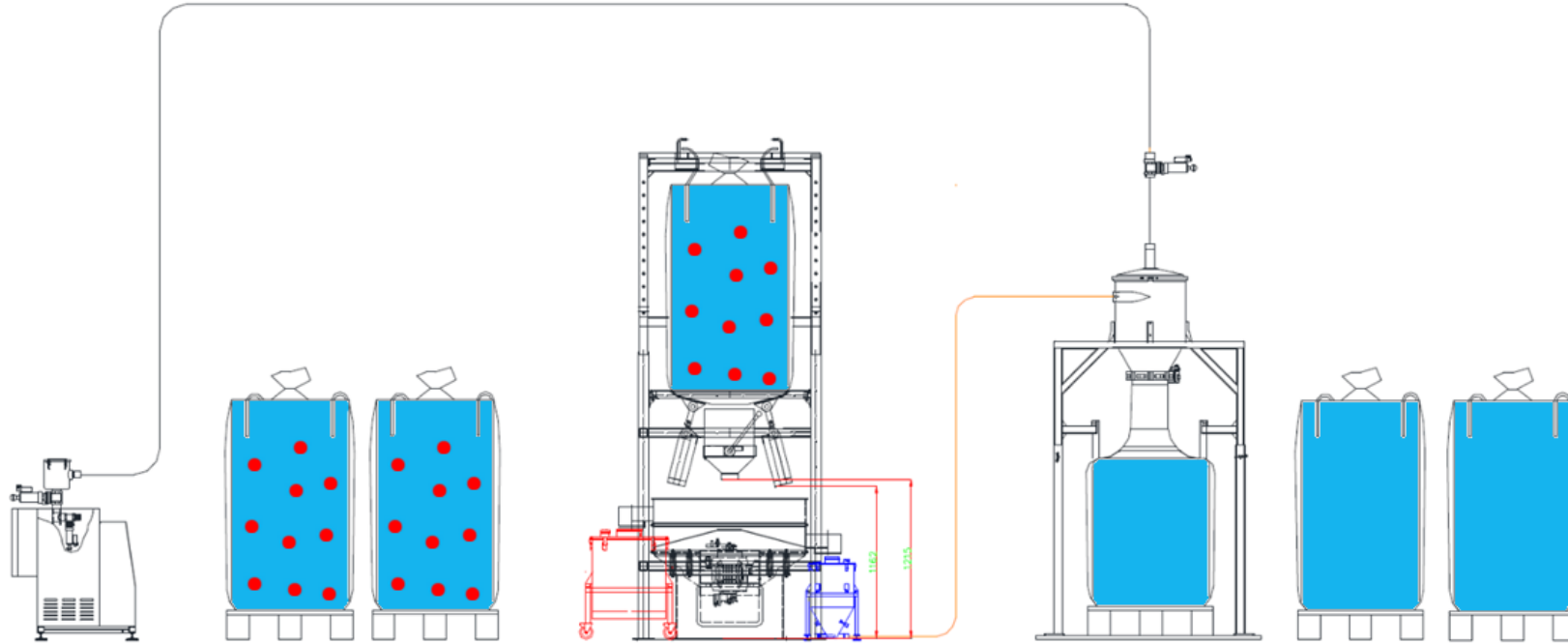


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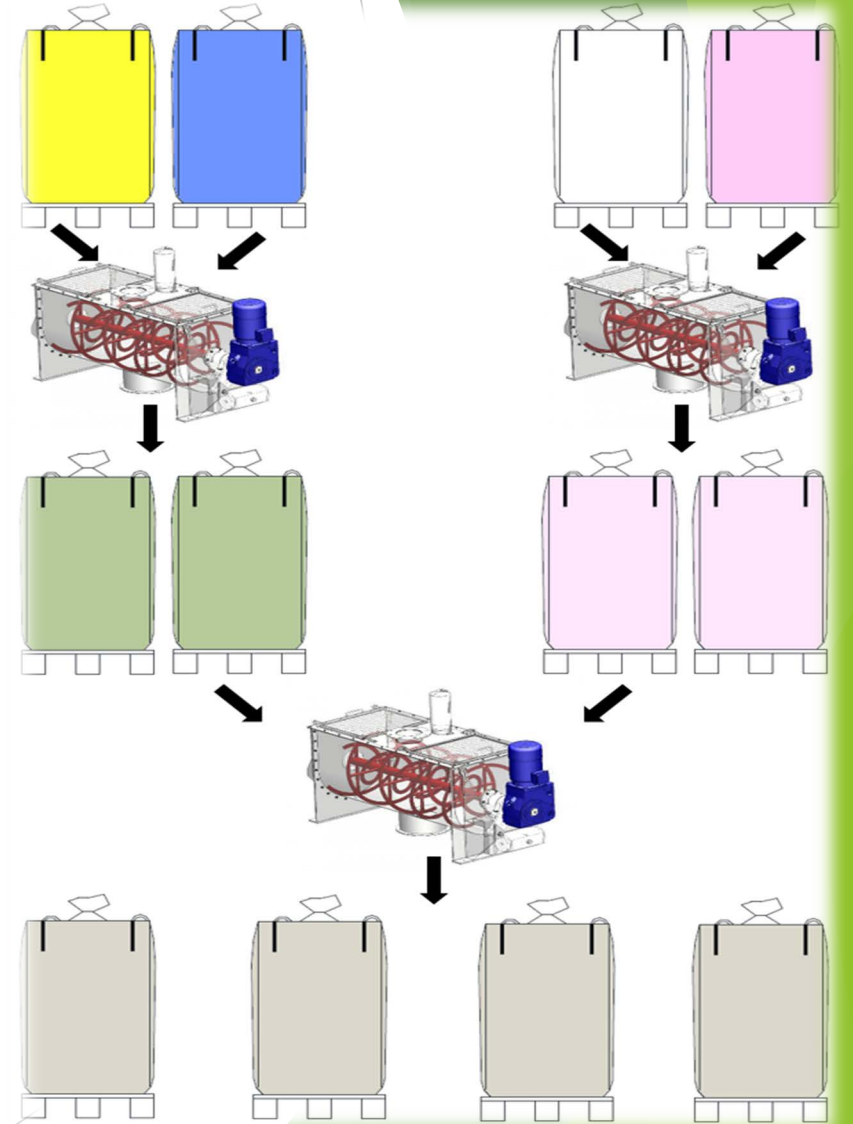
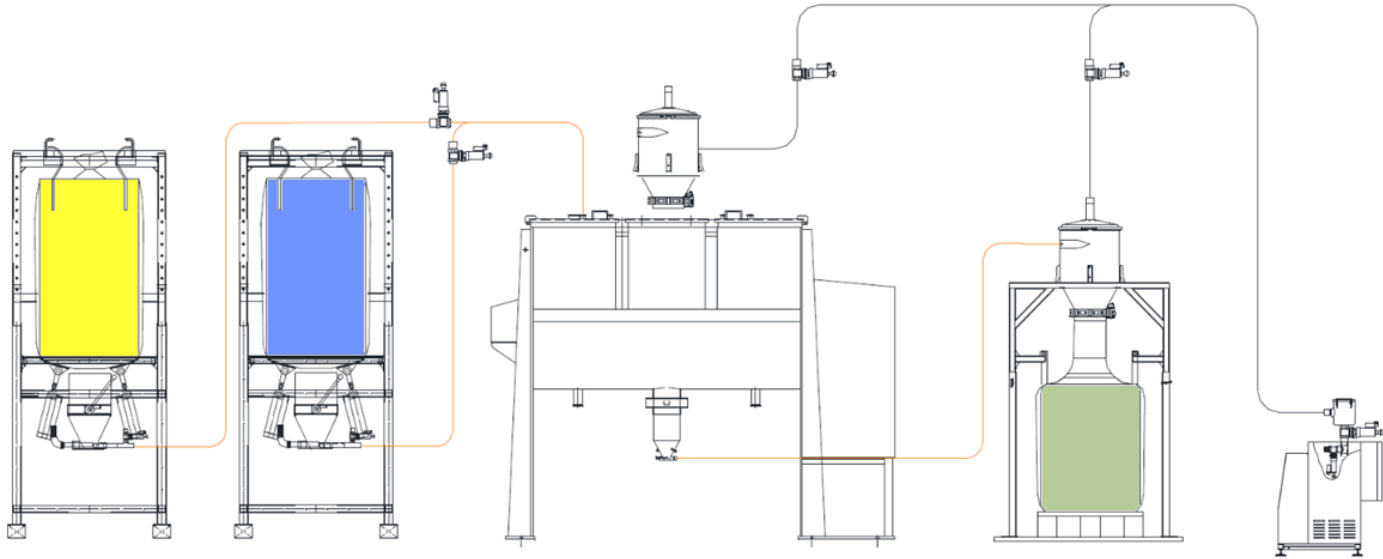




# Primary (Mechanical) Treatment



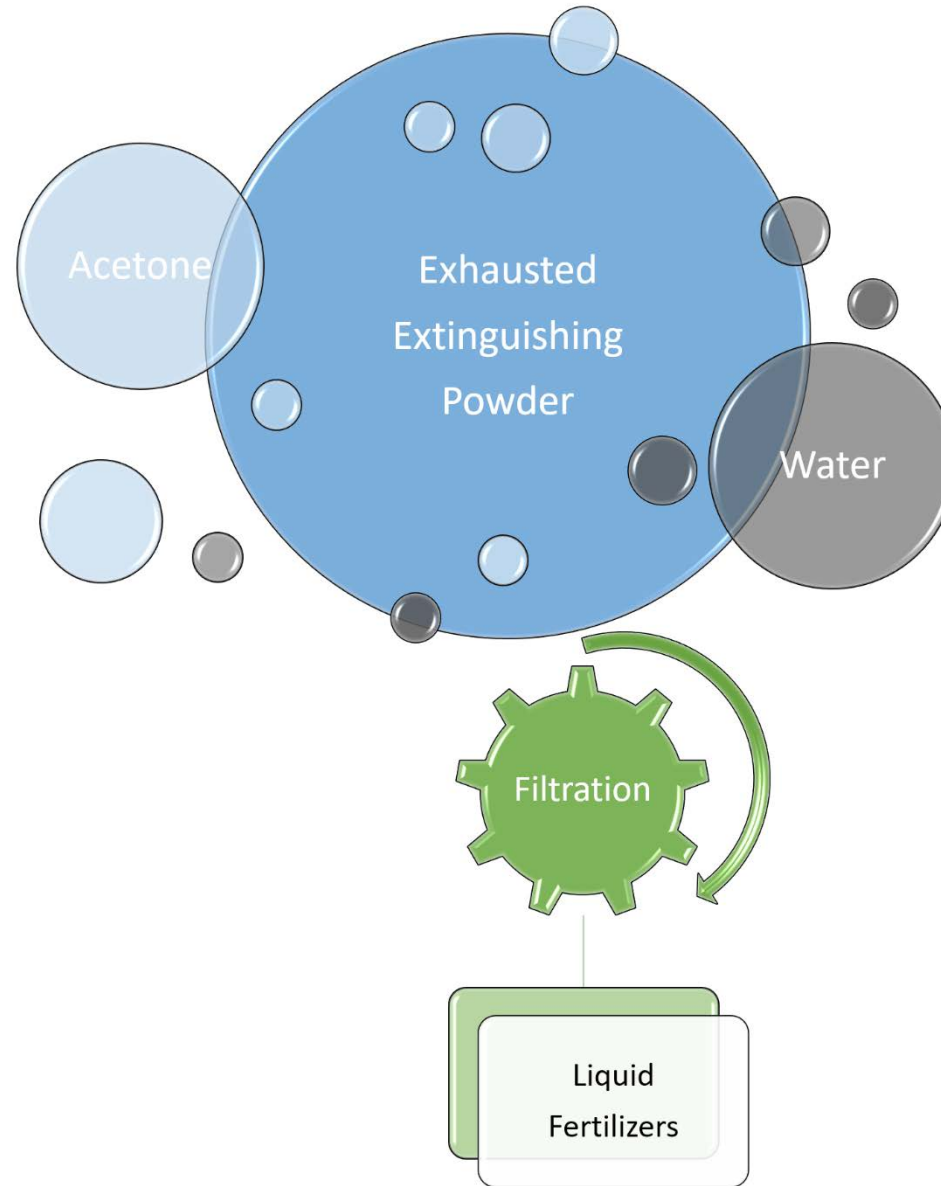
# Homogenization





# European Patent

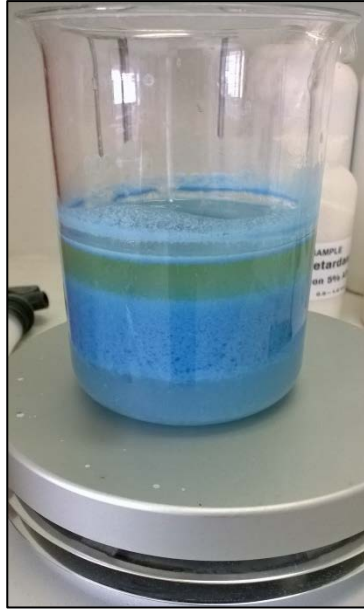
EP 11166044.5





# European Patent

EP 11166044.5

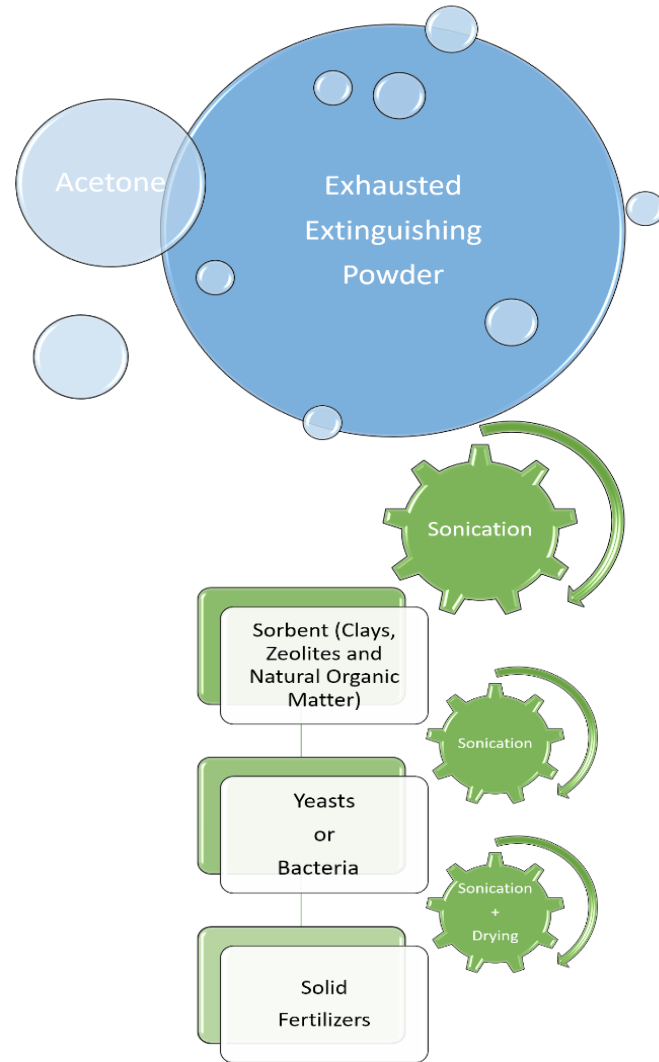


Total nitrogen (as N)	31080 mg/kg
Phosphorus (as P <sub>2</sub> O <sub>5</sub> )	51159 mg/kg
Silicon	135 mg/kg
Silicone oil	n.d (*)
Dyes	n.d (*)
Additives	n.d (*)
Dry residue	20,29% w/vol
(*) below the detection threshold of the instrument i.e. <5 mg/kg	





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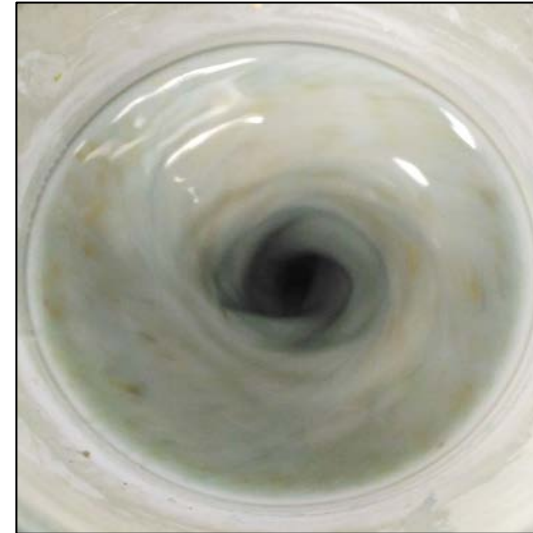
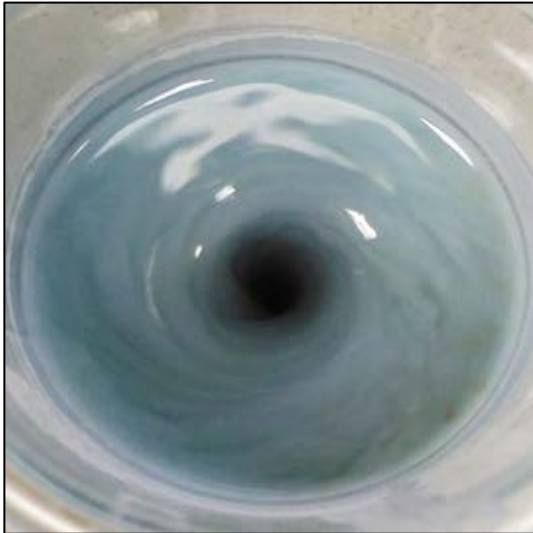
# Removing Color and Heavy Metals

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## Sorbents

(clay, zeolites and organic matter)

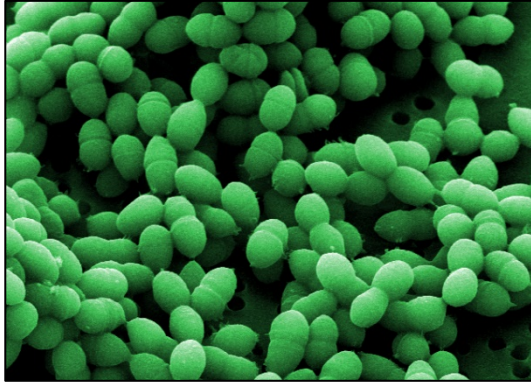
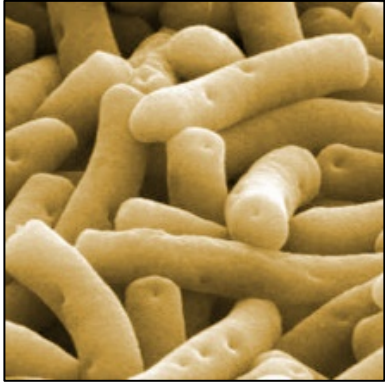


Over Time



# Biological Treatment

IP 102016000108478

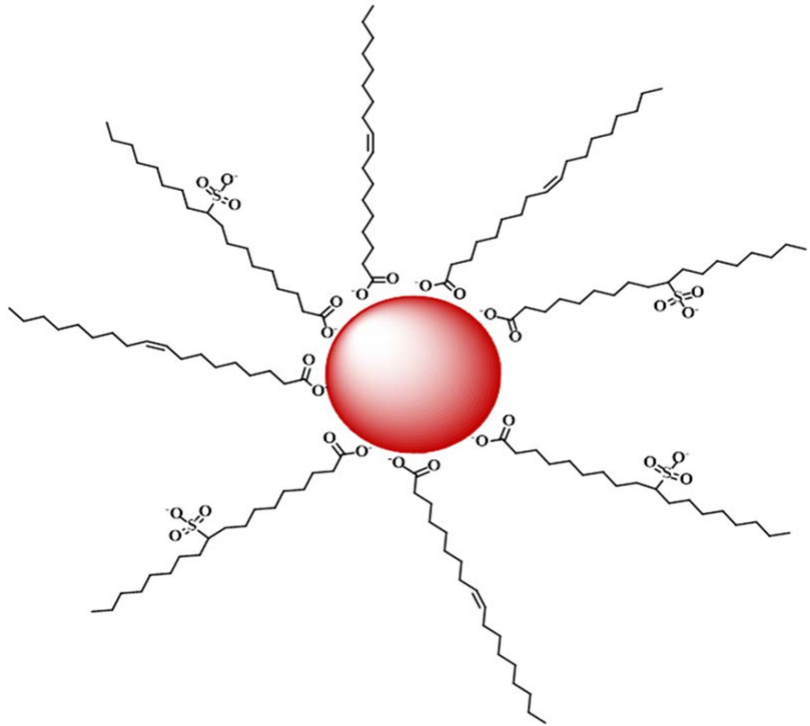


Yeasts  
or  
Bacteria

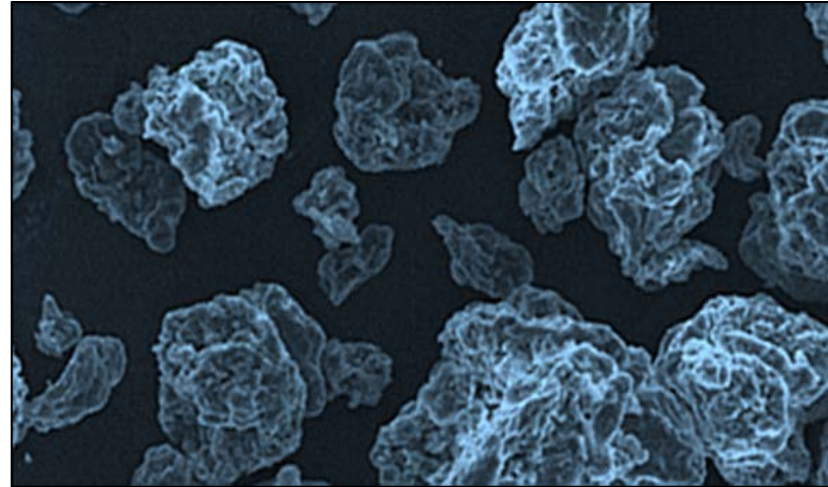


# Liquid Fertilizers

*Magnetic Materials*

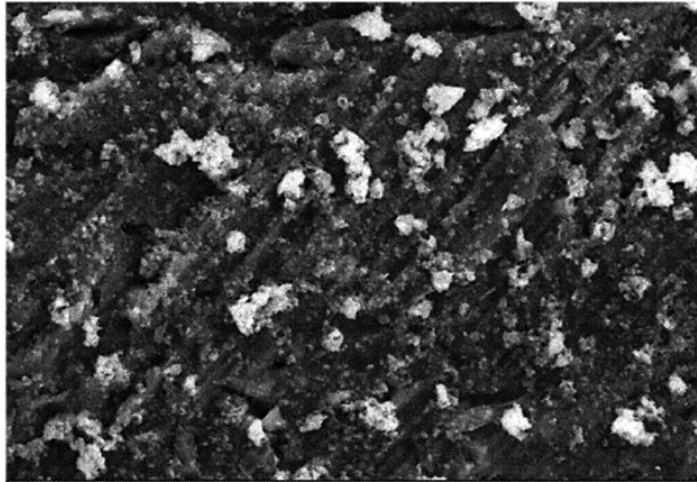


*Zeolites*

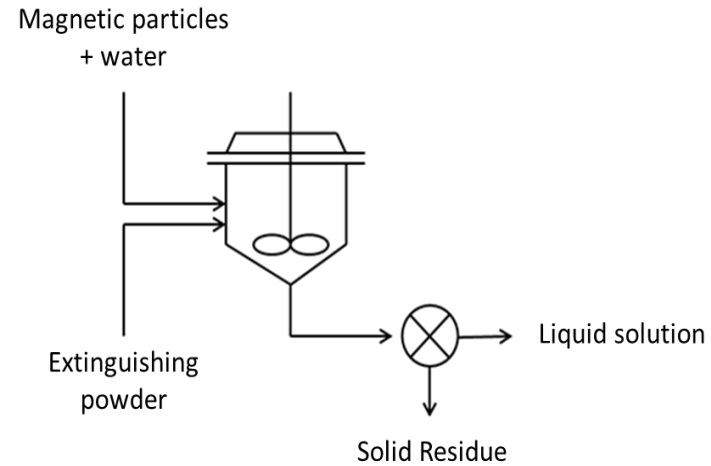




# Magnetic Materials

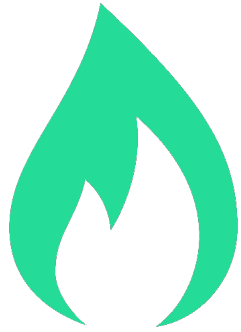


2.00µm EHT = 20.00 kV I Probe = 200pA Vacuum Mode = Variable Pressure Mag = 5.00K X  
 WD = 7.0 mm Detector = VPSE Chamber = 30 Pa Reference Mag = Out Dev.



METAL	UoM	PRE-treatment	POST- treatment	DLgs 152/06 All. 5 Tab 2	Method
As	µg/l	66,9	2,4	10	EPA
Mn	µg/l	927	22,4	50	EPA
Fe	µg/l	4216	36	200	EPA+POM

# Wood Sector



**FLAME<sup>®</sup>  
RETARDANT**  
PROPHOS CHEMICALS



# Microprilled Fertilizers



The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. The shapes are primarily triangles and polygons, creating a dynamic, layered effect. The overall composition is clean and modern.

Thank you  
for your  
attention!

[www.phosave.com](http://www.phosave.com)