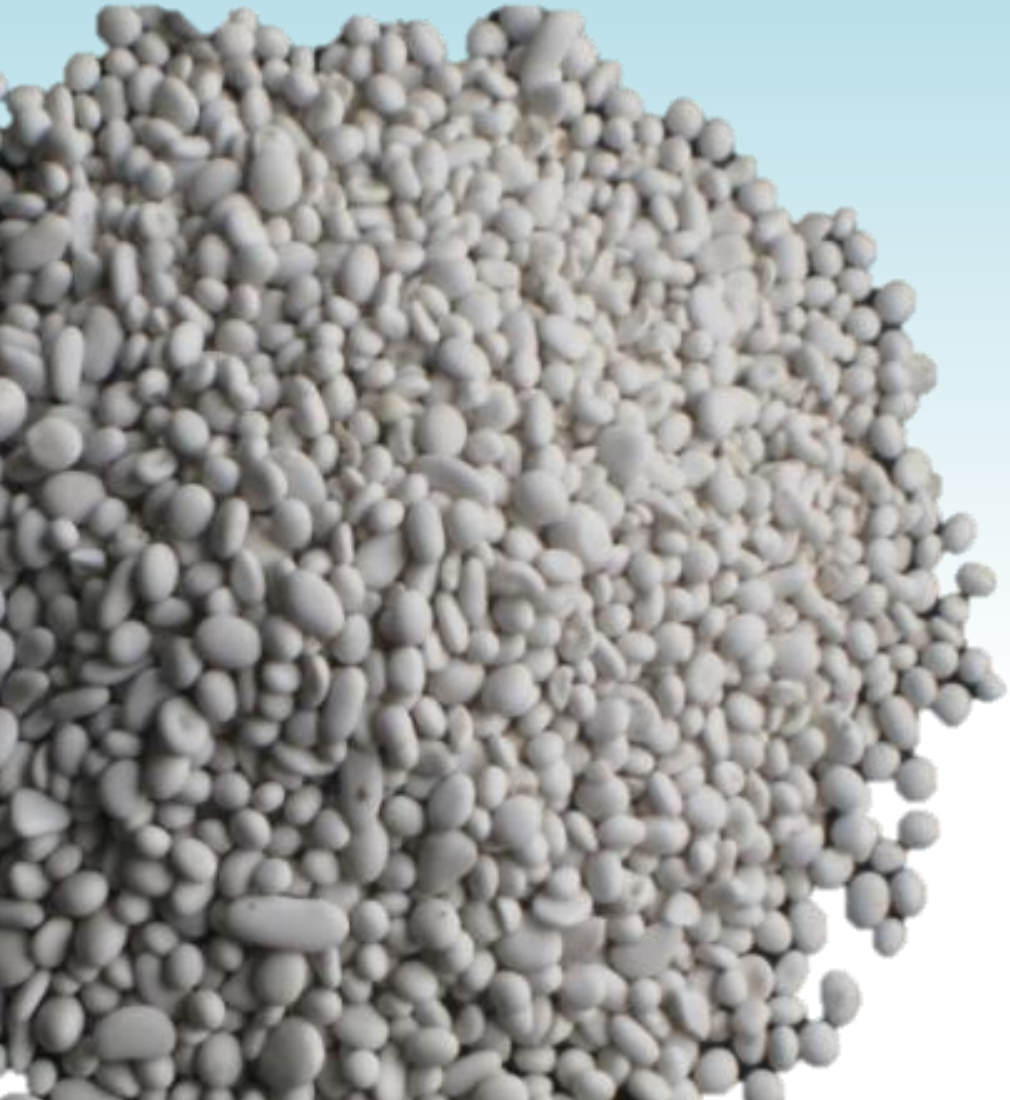
NuReSys®

recovers nature's essentials

REFERENCES

NuReSys®



RECOVERS

P & N

FROM LIQUID WASTE STREAMS

AS

STRUVITE CRYSTALS

2006
Akwadok builds its first struvite reactor.

Application
Dairy industry

Customer
Humana Milchunion E.G.
Altentreptow
Germany

	Technical Data
Start-up	2006
Volume	125m³/h
PO4-P in	60 – 65 mg PO_4-P/l
PO4-P out	15 – 20 mg PO_4-P/l

Struvite reactor built to treat effluent from UASB on effluent of a French Fries processing plant.

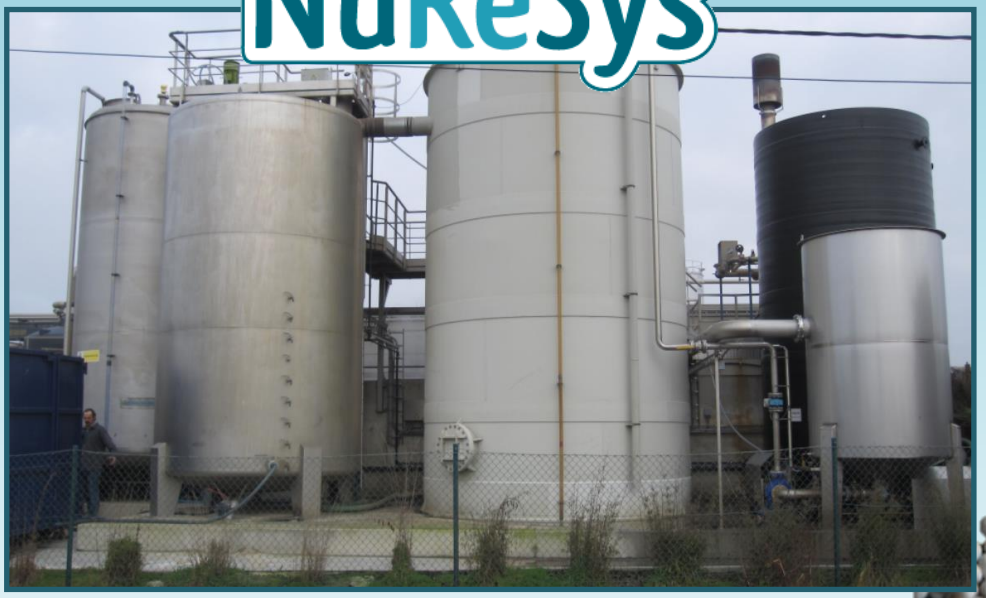
Application

French Fries Production

Customer

Agristo N.V.
Waterstraat 40
8531 Harelbeke-Hulste
Belgium

	Technical Data
Start-up	2008
Volume	60m³/h
PO4-P in	100 - 125 mg PO_4-P/l
PO4-P ef	15 – 20 mg PO_4-P/l
Struvite	**750 Kg/day**



Struvite reactor built to treat effluent from UASB on effluent of a French Fries processing plant.

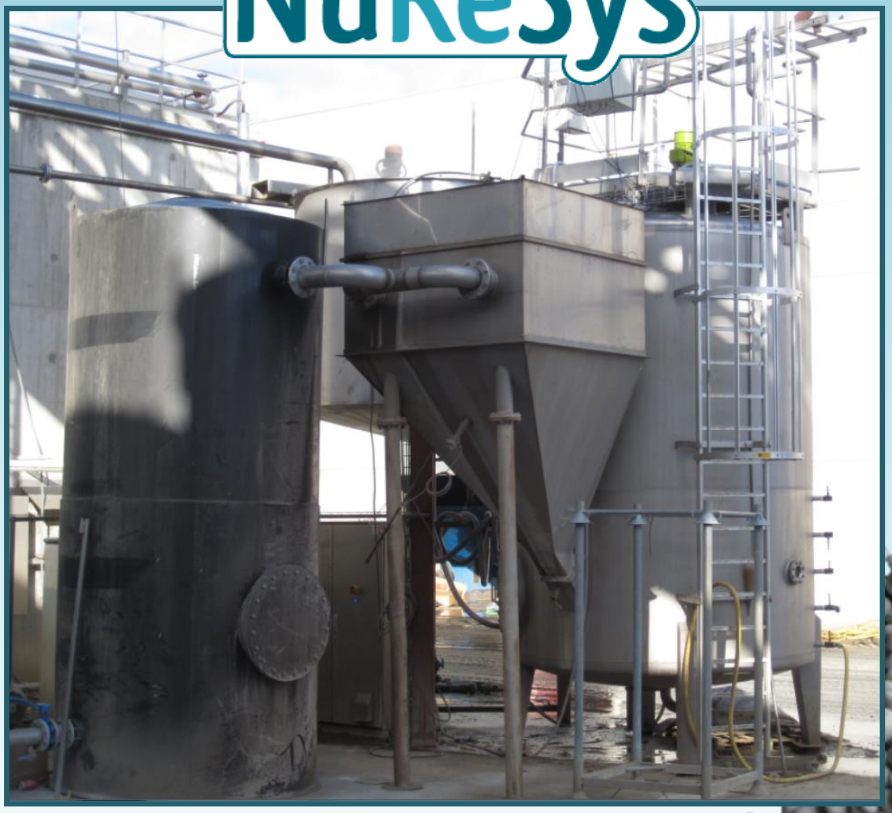
Application

French Fries Production

Customer

Clarebout Potatoes
Heirweg 26
8950 Nieuwkerke / Belgium

	Technical Data
Start-up	2010
Volume	50m³/h
PO4-P in	120 - 150 mg PO_4-P/l
PO4-P out	15 – 20 mg PO_4-P/l
Struvite	750 Kg/day



Struvite reactor built to treat effluent from pharmaceuticals production plant.

Application
Pharmaceuticals

Customer
Genzyme bvba
Cipalstraat 8
2400 Geel / Belgium

	Technical Data
Start-up	2011
Volume	30m³/h
PO4-P in	55mg PO_4-P/l
PO4-P out	15 – 20 mg PO_4-P/l
Struvite	**220 Kg/day**

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Struvite reactor built to treat effluent from UASB on effluent of a French Fries processing plant.

Application

French Fries Production

Customer

Clarebout Potatoes
Chaussée de Lille
7784 Comines-Warneton
Belgium

	Technical Data
Start-up	2012
Volume	80 m^3/h
PO4-P in	115 mg PO_4-P/l
PO4-P out	15 – 20 mg PO_4-P/l
Struvite	**1.100 Kg/day**

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Struvite reactor built to treat effluent from UASB on effluent of a French Fries processing plant.

Application
French Fries Production

Customer
Clarebout Potatoes
Heirweg 26
8950 Nieuwkerke / Belgium

	Technical Data
Start-up	2012
Volume	120 m^3/h
PO4-P in	150 mg PO_4-P/l
PO4-P ef	15 – 20 mg PO_4-P/l
Struvite	1.800 Kg/day

NuReSys technology applied on

DIGESTED SLUDGE

of a **Municipal Waste Water** Treatment Plant

+ avoids clogging of pipes and pumps
+ better dewater ability
+ less PE consumption
+ Struvite harvesting

Struvite reactor applied on **DIGESTED SLUDGE** with 5-6% of suspended solids.

Application
Municipal Waste Water
Treatment Plant

Customer
AQUAFIN
Dijkstraat 8
2630 Aartselaar
Belgium

	Technical Data
Start-up	2013
Volume	8 m^3/h
PO4-P in	220 mg PO_4-P/l
PO4-P out	30 mg PO_4-P/l

Struvite reactors applied on **CENTRATE** of MWWTP.

Application

Municipal Waste Water Treatment Plant

Customer

Waterboard Aa en Maas

RWZI Apeldoorn

The Netherlands

Waterschap Aa en Maas

UW WATERSCHAP

LOGISTICON WATER TREATMENT

NuReSys®

Waterschap Aa en Maas

UW WATERSCHAP

LOGISTICON WATER TREATMENT

NuReSys®

Waterschap Aa en Maas

UW WATERSCHAP

LOGISTICON WATER TREATMENT

NuReSys®

Struvite reactors applied on centrate of MWWTP.

Application

Municipal Waste Water Treatment Plant

Customer

Waterboard AA en Maas
RWZI Apeldoorn
The Netherlands

	Technical Data
Start-up	03/2015
Volume	4,5 m^3/h
PO4-P in	450 mg PO_4-P/l
PO4-P out	20 mg PO_4-P/l

Waterschap Aa en Maas
UW WATERSCHAP

LOGISTICON WATER TREATMENT

NuReSys®

waterschap vallei en veluwe

GMB Ervaar de zekerheid

Imtech

NuReSys technology applied on

- Primary sludge leachate
- Digested sludge
- Centrate

a **HYBRID** combination

NuReSys®

waterschap vallei en veluwe

GMB Ervaar de zekerheid

Imtech


waterschap
vallei en veluwe
NuReSys®
GMB
Ervaar de zekerheid
Imtech

NuReSys®

Struvite reactors applied on digestate + centrate of MWWTP.

Application

Municipal Waste Water Treatment Plant

Customer

Watership Vallei en Veluwe
RWZI Apeldoorn
The Netherlands

	Technical Data
Start-up	03/2015
Volume	73 m^3/h (peak 140m^3/h)
PO4-P in	230/250 mg PO_4-P/l
PO4-P out	20 mg PO_4-P/l
Struvite	**2.600 kg/day**

waterschap vallei en veluwe

GMB Ervaar de zekerheid

Imtech

Effluent Volume	m³/day	1.200				
PO4-P IN	mg/l	120	PO4-P OUT	20	to be removed	100
kg P to be removed	kg/day					120
@ mol Fe / P		1 / 1		2 /1		
Fe to be added	kg/day	631		1.262		
FeCl3 40%	kg/day			3.155		
FeCl3 40%	€/t	200	€/day	631		
Cost to remove 1 kg of P (FeCl3)				5,26		

@ mol Mg / P		1,1 / 1				
MgCl2 32%	€/kg P		0,831			
ratio NaOH / m³	l/m³	0,100				
NaOH 29%	€/kg P		0,153			
E-Power installed	KwH	24				
E-Power consumption	€/kg P		0,115			
Maintenance	€/kg P		0,210			
Cost to remove 1 kg of P (NuReSys)				1,309		
(50€/Ton)	Value of struvite			-0,400		
	Avoided cost N removal			-0,600		
	Final Opex			0,309		

kg P to be removed / year	kg/y			42.000		
Price difference	€/kg P			4,95		
Benefit	€/year			207.861		
Capex	€	526.000				
Amortization time	**months**			30		

Interesting volume : 50m³/h

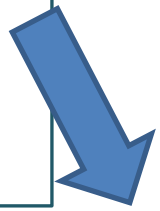
Interesting PO_4-P level : 120ppm

The higher the volume

the lower the Capex / Kg P removed

The higher the PO_4-P concentration

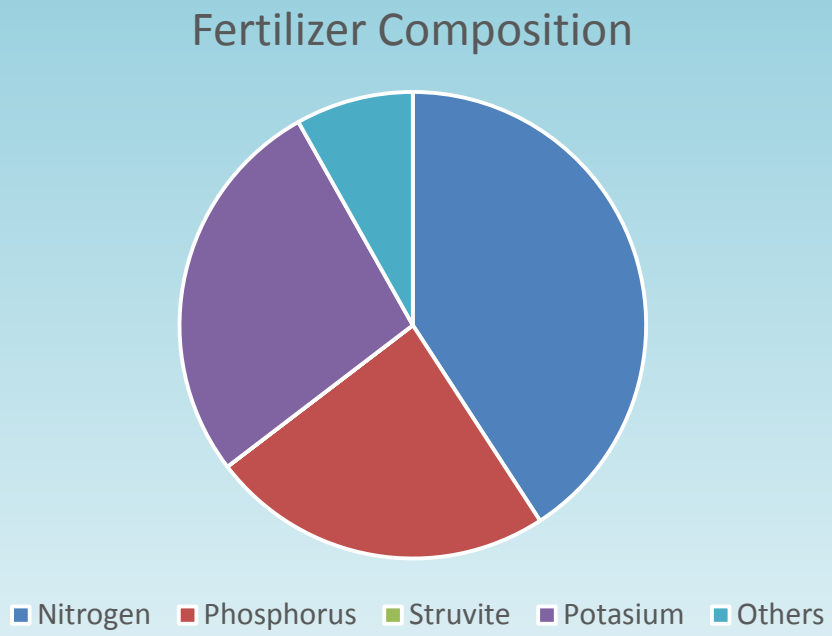
the lower the ammortisation cost / Kg P removed



Effluent Volume	m³/day	1.200				
PO4-P IN	mg/l	180	PO4-P OUT	20	to be removed	160
kg P to be removed	kg/day					192
@ mol Fe / P		1 / 1		2 /1		
Fe to be added	kg/day	1.010		2.019		
FeCl3 40%	kg/day			5.048		
FeCl3 40%	€/t	200	€/day	1.010		
Cost to remove 1 kg of P (FeCl3)				5,26		

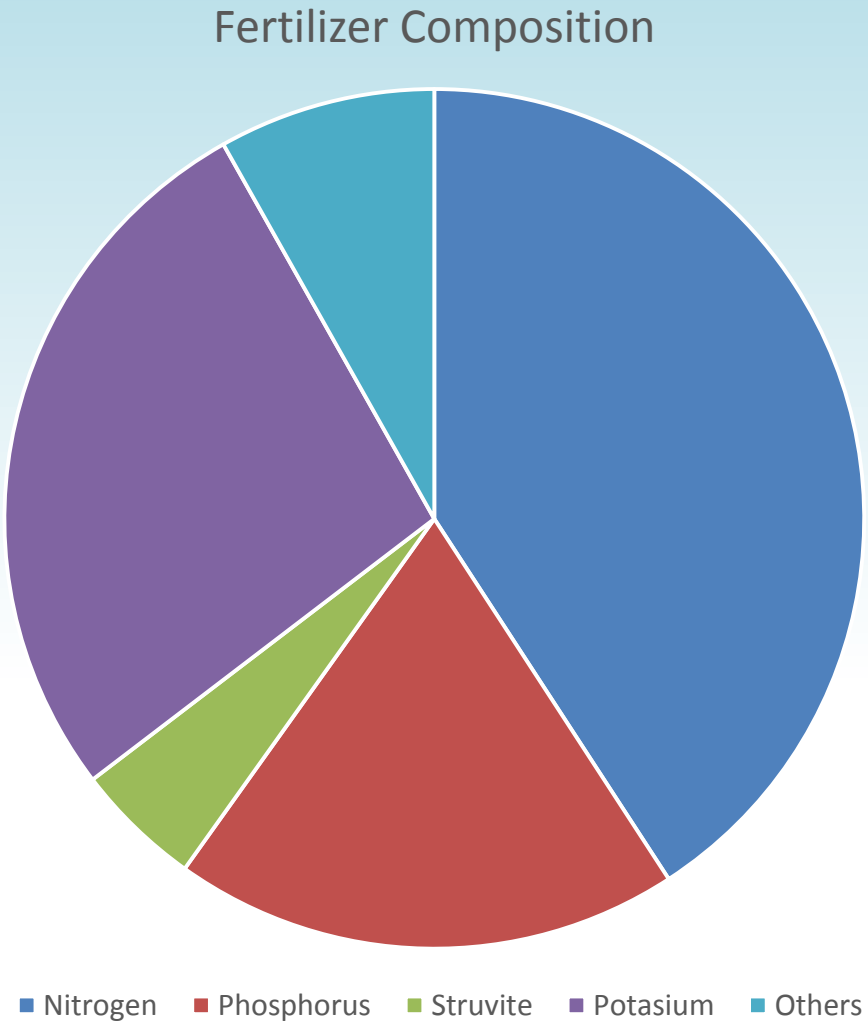
@ mol Mg / P		1,1 / 1				
MgCl2 32%	€/kg P		0,831			
ratio NaOH / m³	l/m³	0,100				
NaOH 29%	€/kg P		0,153			
E-Power installed	KwH	24				
E-Power consumption	€/kg P		0,115			
Maintenance	€/kg P		0,210			
Cost to remove 1 kg of P (NuReSys)				1,309		
(50€/Ton)	Value of struvite			-0,400		
	Avoided cost N removal			-0,600		
	Final Opex			0,309		

kg P to be removed / year	kg/y			67.200		
Price difference	€/kg P			4,95		
Benefit	€/year			332.577		
Capex	€	526.000				
Amortization time	**months**			19		



STRUVITE in FLANDERS

3,5 tons/day



1/5 of the original $P_2 0_5$ content has been replaced by $P_2 0_5$ as struvite

Applied on rather acid ground

42T of P = 335 T of struvite

STRUVITE

CONSIDERED TO BE A SLOW FERTILIZER

USED AS A STARTER FERTILIZER

FOR MAIZE…


STRAVIET


STRAVIET
10 kg/ha
5-25-0 10 MgO

THANK YOU

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