

# What to Expect

PTFE · Micro-sized PTFE · Granules · Hybrid waxes · Micro-sized hybrid waxes · Natural waxes · Oi ulsions · Polypropylene waxes · Micro-sized polypropylene waxes · Powders · Micro-sized Silica · Solv persions · Sugar cane waxes · Micro-sized sugar cane waxes · Water-based dispersions · Water-based il-based dispersions · Zinc · Air classified waxes · Amide waxes · Micro-sized amide waxes · Benzoin xes · Micro-sized diamond · Fischer-Tropsch waxes · Micro-sized Fischer-Tropsch waxes · Polyethylene cro-sized polyethylene waxes · PTFE · Micro-sized PTFE · Granules · Hybrid waxes · Micro-sized hybrid tural waxes · Oil-borne emulsions · Polypropylene waxes · Micro-sized polypropylene waxes · Powder I Silica · Solvent-based dispersions · Sugar cane waxes · Micro-sized sugar cane waxes · Water-based

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#### **DEUREX - THE WAX COMPANY**

- Medium-sized family business
- Over 30 years of experience
- Customers in over 38 countries
- 110 permanent jobs have been created



## Waxes...

... are required for the production of printing inks, lacquers, hotmelts, rubber, plastic and much more...

## PRODUCTION SITE





1989	Foundation of DEUREX GmbH
1990	Installation of first production site for PE waxes
1997	Invention of spray micronization of waxes
2000	Startup of 1st spray tower
2007	Foundation of DEUREX AG for marketing of waxes
2008	Invention of natural sugar cane waxes
2010	Invention DEUREX PURE
2011	Sale of micro business
2012	Expansion of production and warehouse site
2013	Startup of production DEUREX PURE
2013	Startup of production sugar cane waxes
2014	Development and introduction of hybrid waxes
2015	Startup production of Fischer-Tropsch waxes
2016	Modification of light sugar cane waxes
2017	Winner of the "European Inventor Award" for PURE
2017	Relaunch micro-sized waxes
2019	Production of oxidized PE and FT waxes

Married Married Community



## Innovative Business Approach

Inventor of Spray Micronized Waxes, Suger Cane Waxes, Coated Micronized Waxes, PURE







### WHAT IT DOES?



Suitable for hydrophobic liquids, as oils and chemicals, alcohols and surfactants.

1 kg binds up to 13,75 l oil, quick absorption due to large surface of 3 m<sup>2</sup>/g of the raw material.

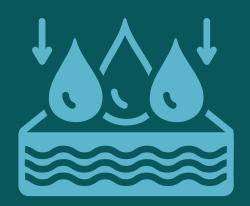
Binds permanently, absorbs no water and floats permanently on the surface even when saturated. Can be removed without residue.
Can be seperated mechanically then reused, burned up or recycled.

- Environment friendly and hydrophobic wax cotton
- Adsorbs all hydrophobic liquids (such as Oil, Solvent, Chemicals, Petrol, Alcohol, Surfactants etc.) on the water surface
- Fast rate of adsorption, purification within a few minutes
- Hydrophobic doesn't bind any water at all
- Water flows unhindered through PURE, only the pollutant will be absorbed
- Works in seawater and fresh water



- Protection of water and environment due to insolubility
  - Non biodegradable
  - No hazardous goods
  - Easy to separate from water
  - No residues
- Long time adsorbent (prevention agent)
  - Permanently resistant to UV
  - Robust to all kind of weather conditions
  - Binds the soaked pollutant permanantly
  - Floats permanantly on the surface even when fully saturated





CERTIFICATES

HIGH RATE OF ABSORBTION



CEDRE (FRANCE)

13,75 l/kg

ITC (CZECH REPUBLIC)

9,11 **I/**kg

DEKRA UMWELT (GERMANY)

6,55 l/kg

## Redemption by DEUREX Easy removal Mechanical Seperation from water by Centrifuge Reuse of PURE and Pollutant without any significant loss of efficiency





### EUROPEAN INVENTOR AWARD 2017





"Günter Hufschmid's
invention could
change the way oil
and chemicals are
cleaned up after a
potentially
devastating spill."



Technical Relief Agencies
Fire Departments
Schleswig-Holstein State Coastal Protection Agencies
Industrial Parks
Oil Spill Response
Shipping Companies
Ports and Marinas
Steel Plants

Car Workshops
Motorway Maintenance
Sewage Treatment
Airport Maintenance
Gas Stations
Rain Storage Reservoirs
Wind Turbine Parks





#### **EXAMPLE 1**

Oil damage protection for wind turbines with the OSC Oil Safe Collar by Rotor Rope.

Depending on size the gearbox, the generator and other hydraulic actuators are filled with 300 to 800 l of oil. With 1,000 wind turbines, 3-4 turbines per day suffer oil damage causing contamination in the ground or at sea. The ring is filled with DEUREX PURE, it catches the oil damage and reduces maintenance effort and protects our environment.

## OEOS one earth-one ocean

#### **EXAMPLE 2**

oeoo purifies waters in Nigeria from immense oil spills caused by pipelines. They want to prove that these can be eliminated with relatively simple means, the support of the local people and the use of DEUREX PURE.





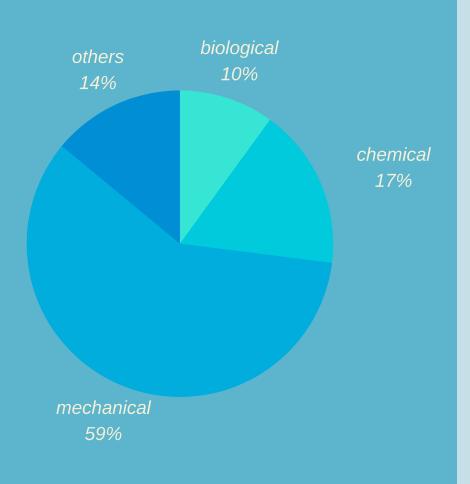


#### MARKET DESCRIPTION

- Total Market for oil spill management = 131 billion USD/a
  - Pre-Oil Management 77 % = 101 billion USD/a
  - Post-Oil Management 23% = 30 billion USD/a
  - CAGR of 3 % p.a. from 2019 2025
- Market Driving:
  - Growing safety concerns and Regulations
  - Increasing Number of Global oil spills
  - Rising onshore and offshore drilling activities led to
  - rapid growth in oil transportation

## MARKET DESCRIPTION: POST-OIL SPILL RESPONSE TECHNIQUE

- Most common method is trying to contain the spill machanical (like PURE).
- Mechanical recovery involves the use of containment booms, skimmers and aktive booms.
- The market is fragmented with major companies striving for market leadership.
- The use of PURE may provide a comparative advantage over conventional products.



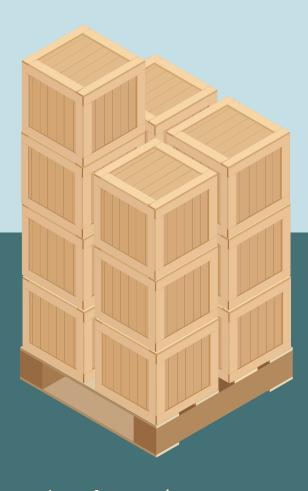
	ABSORBENCY litre oil/ kg	TYPE OF POLLUTANT	HYDRO- PHOBIC	ECO - FRIENDLY	PERMANENTLY FLOATABLE/ LONG TERM USAGE	REUSABLE	RESIDUE FREE	UNHINDERED WATER PERMEABILITY
WAX   PURE	13,75	UNIVERSAL	<b>~</b>	<b>~</b>	<b>✓</b>	<b>~</b>	<b>✓</b>	<b>~</b>
POLY- PROPYLENE	5,8	OIL ONLY	<b>✓</b>	×	<b>~</b>	×	<b>✓</b>	×
POLY- URETHANE	5,2	OIL ONLY	<b>~</b>	×	×	×	×	×
CORK	4,8	OIL ONLY	×	×	<b>~</b>	×	<b>~</b>	<b>✓</b>
PEAT	2,8	UNIVERSAL	×	×	×	×	×	<b>✓</b>
RUBBER MATERIALS	1,2	OIL ONLY	<b>~</b>	×		×	×	×

## Comparison to...

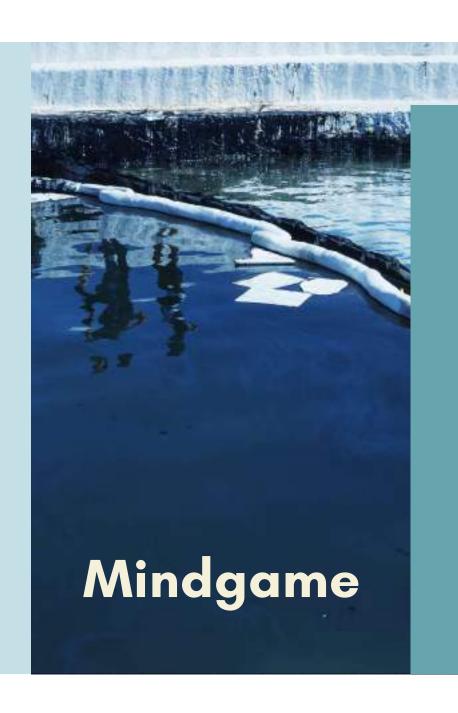
...A COMMON GRANULATE:
RECOVERY OF A SMALL OIL SPILL (100 L)







200 kg of granulate are required



CRUCIAL FACTORS IN THE EVENT OF AN OIL SPILL:

#### **Response Time**

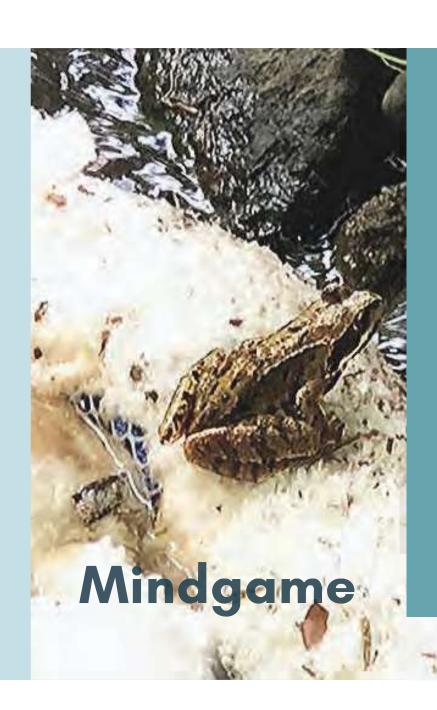
Fast response time is crucial < 8 hours

#### Volume

Huge volume of oil binder needed; limited capacities on boats

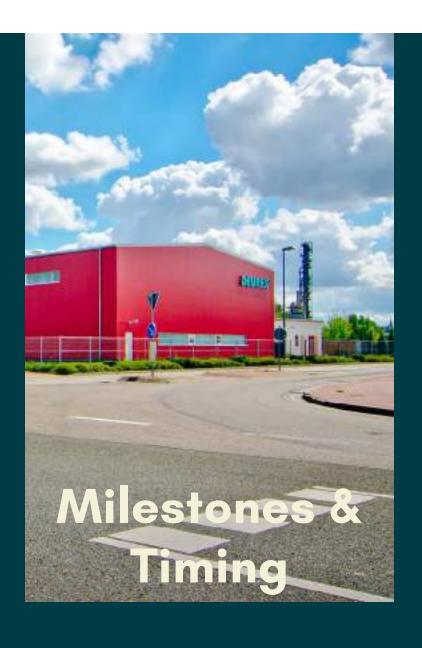
#### Recovery

The soaked binder works even under heavy sea conditions



#### MOST EFFICIENT SOLUTION

- Carry the raw material on board of the vessel
- Produce PURE on board (1g raw material = 3 m² of PURE)
- PURE can be sprayed directly into the ocean (machine is similar to a snow cannon)
- Trawl or suck up the soaked PURE from the water surface
- Seperate Oil and Pure on board
- Shredder or centrifuge the recycled PURE and spray it into the ocean again
- Repeat until the contamination is fully removed



**2010** Chance Discovery of DEUREX PURE and

Exploration of the outstanding properties

**2011** Standardized testing (by DEKRA, CEDRE, ITC)

**2012 Nov** German Patent (valid 20 years)

2014 Completion of the laboratory plant

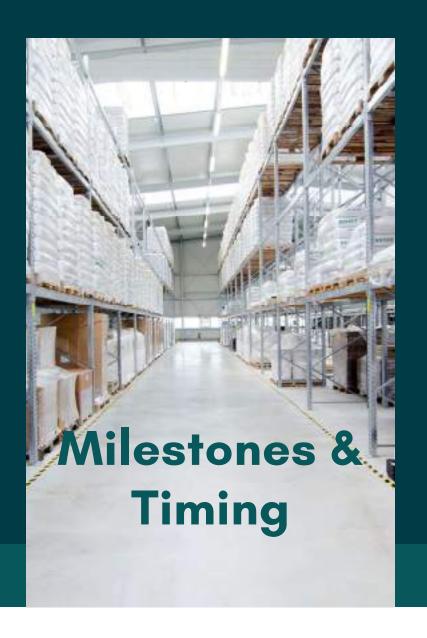
2015 Dez European Patent (valid 20 years)

**2016** Technological upscaling to develop pilot plant

**2017** Winning European Inventor Award

Securing the raw material supply chain for

12.000 t/a



**2018** Ensuring industrial reproducibility

Completion of pilot plant 400 t / a

2019 Marketing LaunchSecuring new markets and collaborations

**2020** Development of PURE made from renewable

resources

**2021** Development of a PURE plant for oil spill

vessels

## Who Are We?



GÜNTER HUFSCHMID
Inventor
CEO DEUREX AG



FELIX HUFSCHMID

Project Manager
M.Sc. Economics
M.A. Educational Management

#### PHILIPP HUFSCHMID

Projekt Manager M.A. (TUM) Architecture



### Let's Talk

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