ODB SYSTEM

TIBIO

Bioremediation of oil-filled cables

TIBIO SAGL
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Switzerland

OUR
COMPANY & BUSINESS SECTORS

TIBIO is part of the Frattale Group holding company based in Lucerne, Switzerland.

TIBIO's products and services are designed for **environmental professionals**.

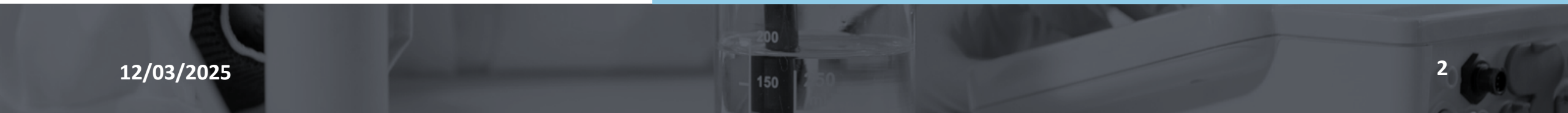
Commercial activities

Environmental biotechnology: biotechnological applications for the treatment and management of pollutants and for the management of public health problems

Chemicals: development of solutions for treating pollutants (absorbent polymers)

Green chemistry & Microbiology: chemical reactions using enzymes and micro-organisms

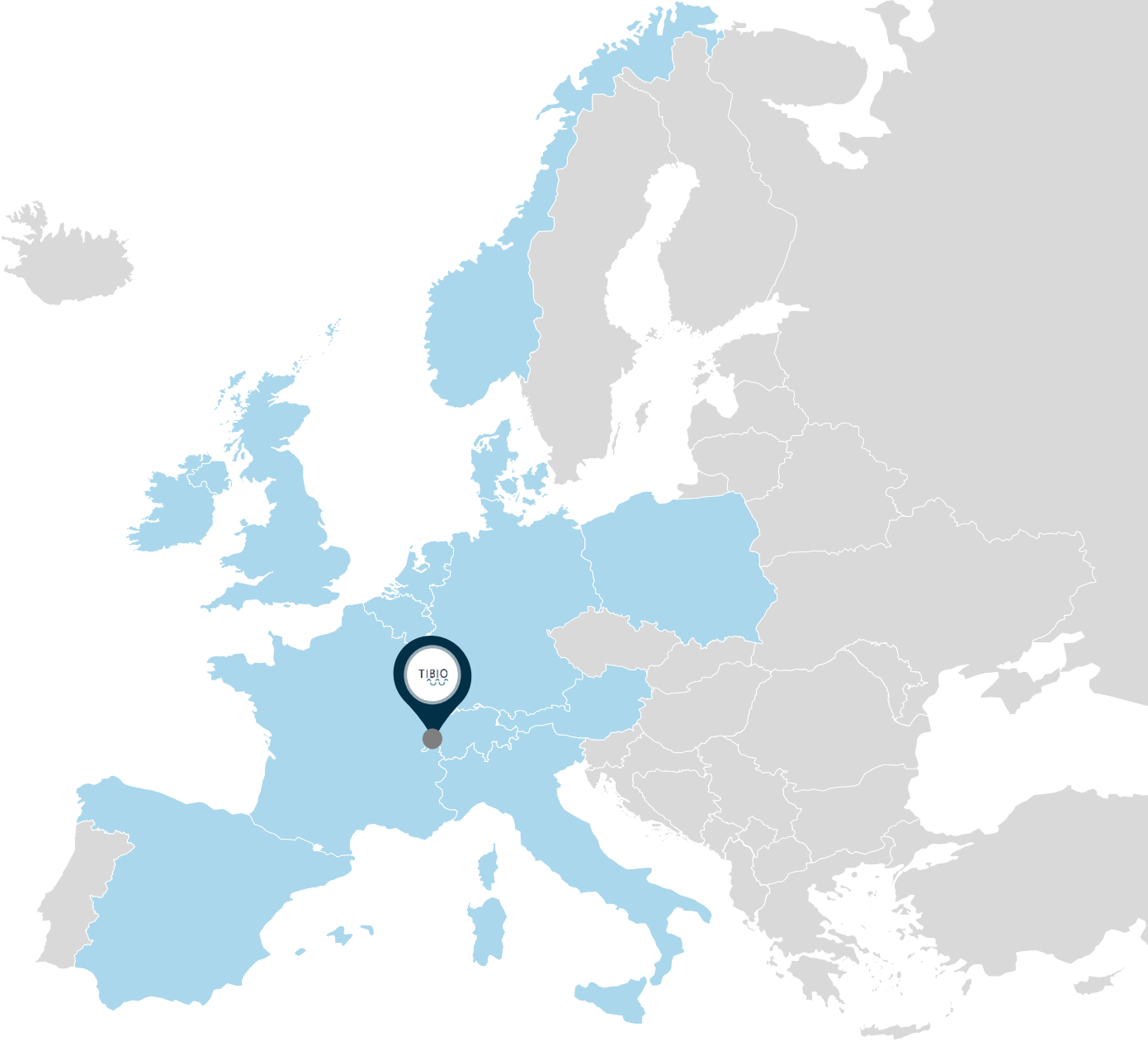
Scientific support & Due Diligence: support for environmental professionals



LA
COMPANY MISSION

SUSTAINABILITY

We are firmly convinced of the need to move towards industrial applications that maintain and enhance quality of life while **minimizing** or even neutralizing **environmental impacts**.



OVER 15 YEARS' INTERNATIONAL EXPERIENCE

ODB SYSTEM®
OIL DEGRADATION BY BACTERIA SYSTEM

ISSUES & REGULATORY CONTEXT

Fluid-oil cables pose a risk to the environment, since degradation of the outer sheath structure very often leads to leaks into the ground.

For this reason, when cables are de-energized, managers resort to several complex and costly approaches:
- Permanent control of cable pressure
- Excavation and removal of the cable along its entire length
- Compressed air blast for partial oil drainage

The ODB System® solution is an effective alternative that removes all the oil contained in the cable, rendering it inert and thus neutralizing the environmental risks associated with its presence in the soil.

Cables must **be physically removed**

Depending on the route of the underground link, dismantling the cables is a very costly operation, requiring site closures and complex civil engineering works, particularly in urban areas, difficult-to-access zones and protected areas.

The excavation of fluid-oil cables requires strict methodology and special attention to the high risk of leakage during handling operations.

Obligation to **monitor oil pressure**

Underground cables are kept under pressure after the link has been taken out of service.

When a pressure drop is identified, it is usually due to an oil leak, which must be detected as soon as possible. The cost of repairing the damaged section of cable and treating the contaminated surrounding land is high, given the operational complexity and degree of urgency.

SOLUTION

ODB System® offers a **safe, flexible and minimally invasive turnkey solution** for decommissioning underground oil cables and treating dielectric oil contamination in situ.

The **only 100% organic solution** that meets today's requirements.

A SWISS TECHNOLOGY DEVELOPED BY

ODB SYSTEM®
FEATURES

ODB System® offers a **safe, flexible and minimally invasive turnkey solution** for the decommissioning of underground oil cables and the complete treatment of dielectric oil contamination.

The **only biological solution** that meets today's requirements to eliminate 100% of the environmental risks associated with the degradation of fluid-oil cables over time.

In situ treatment avoids excavation and dismantling costs.

Installation of an ODB System ® injection unit on customer site

ODB SYSTEM®
APPLICATION

Underground connections using **oil-filled cables (OF)** pose an environmental hazard due to the risk of oil leaking into the ground.

Environmental agencies are making managers and owners aware of the contamination that can be generated by oil-filled cables, both during and after their period of operation.

Widespread **alternative methods** such as compressed air blasting are **not effective**, since the oil volume is only partially drained, and therefore does not exclude the risk of leakage into the ground.

Cable solution
single-phase and three-phase

ODB SYSTEM®
SCOPE OF ACTION

The ODB System® solution is **compatible with** all types of oil-filled cable, from 16 kV to 400 kV, **regardless of the length of the** link.

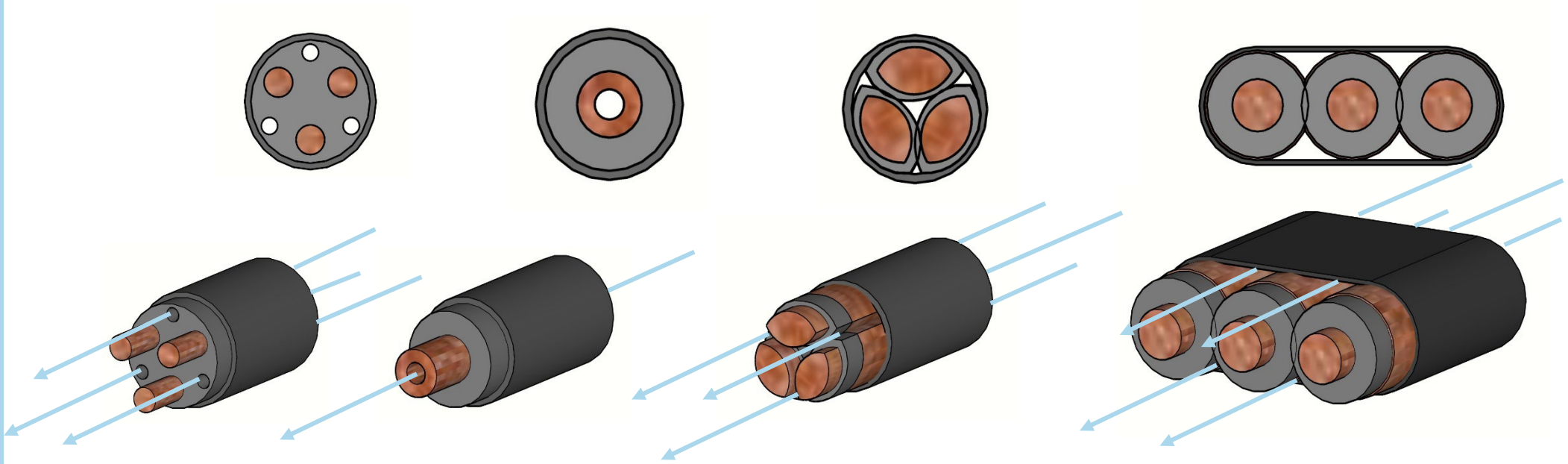
The bacterial solution is injected into the permeable channels and spreads through the paper matrix.

Conductor
Copper or Aluminium

Insulation
Paper matrix

Outer sheath

ODB solution

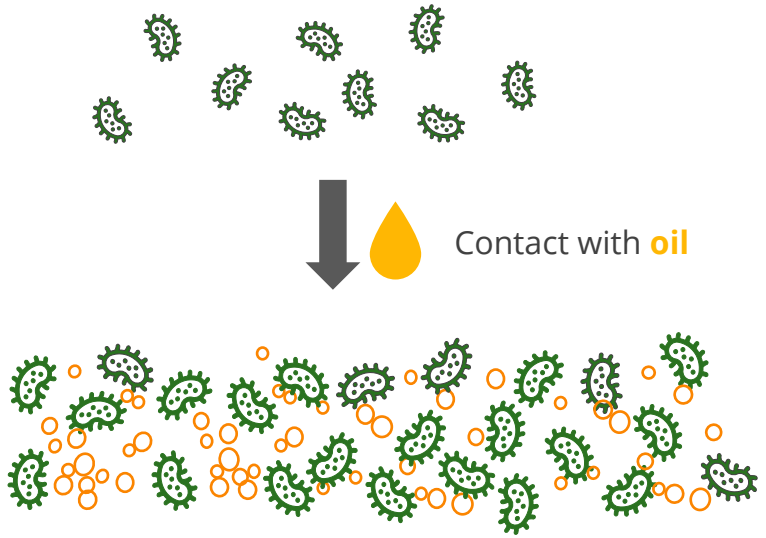


ODB SYSTEM®
MICROBIOLOGICAL APPROACH

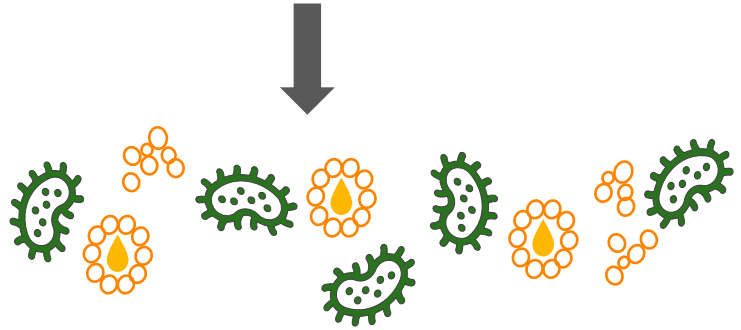
The bacteria in the ODB system are selected for their **biodegradation capacities** and are **highly effective** in removing and mobilizing hydrocarbons.

The decontamination process is based on a **natural**, totally **environmentally-friendly** procedure.

These bacteria offer a **wide range of** bioremediation **applications**, notably in the industrial, contaminated sites and soils and marine environment sectors.



Bacteria proliferate inside the cable, degrading the **oil** and producing **biosurfactants**.

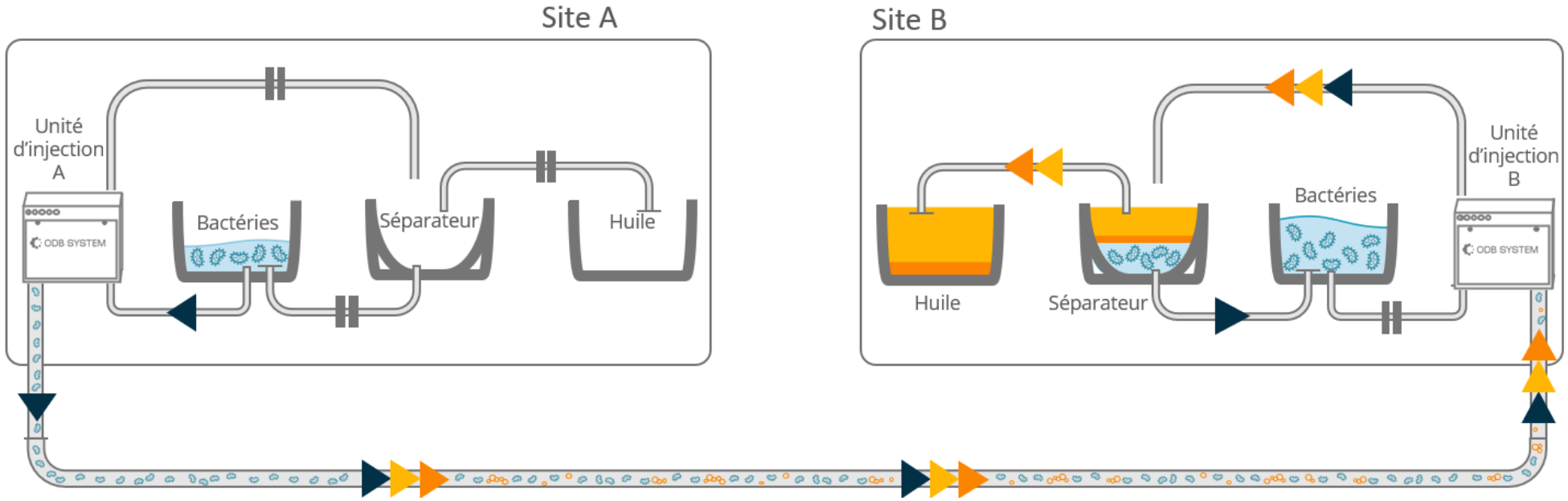


Biosurfactants help mobilize the **oil** in the cable.

ODB SYSTEM®
OPERATING PRINCIPLE

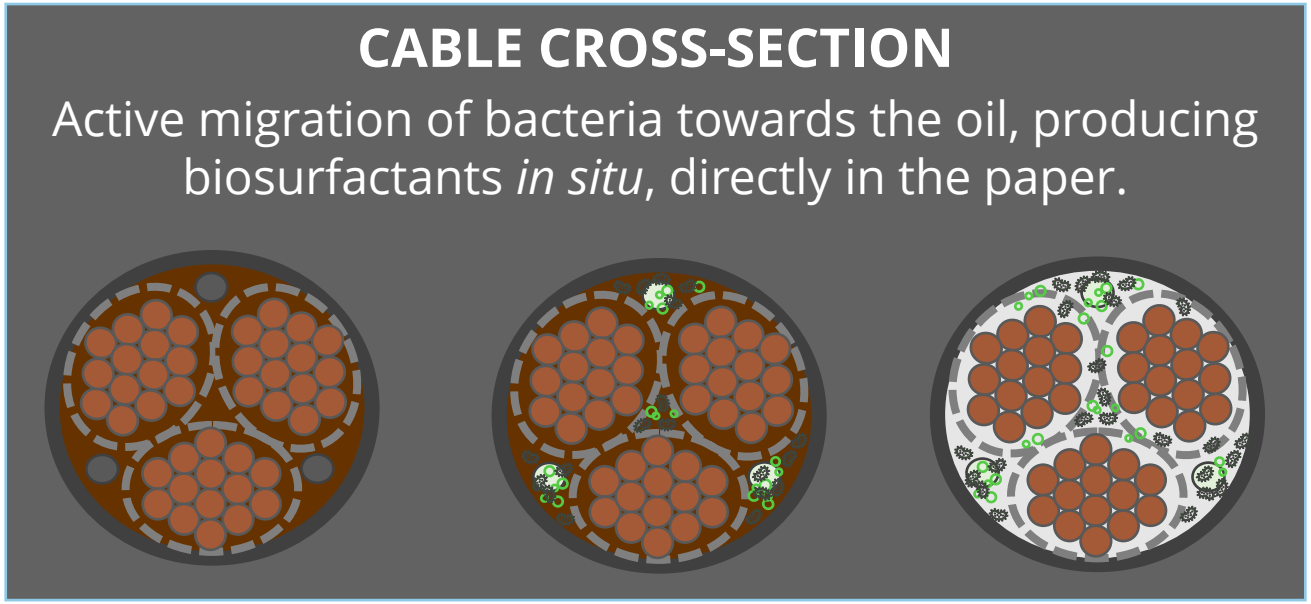
For 14 to 16 weeks, the bacteria are injected bidirectionally into the cables.
Weeks 1, 3, 5, 7, 9, 11, 13, (15): Injection from site A to site B.
Weeks 2, 4, 6, 8, 10, 12, 14, (16): Injection from site B to site A.

Injecting bacteria from site A extracts the oil from the cable and collects it at site B.
At site B, the oils are then separated from the bacteria and stored in separate tanks.
The bacteria recovered at site B will be reused in the next injection cycle, at site A.



ODB SYSTEM®
OPERATING PRINCIPLE

ODB System® is the only solution that cleans the oil-impregnated paper matrix through biodegradation and bacterial mobilization.



1. Before treatment

2. Injection of bacteria into permeable channels

3. Penetration of bacteria into the paper matrix

ODB SYSTEM®
SAFETY

The patented ODB System® biotechnological solution is based on a **natural**, **environmentally-friendly** process.

It's a blend of risk class 1 bacterial strains where no toxic chemicals are used and no environmental pollutants are produced.

Their use poses no risk to humans or the environment, in accordance with European directives* and other applicable regulations.

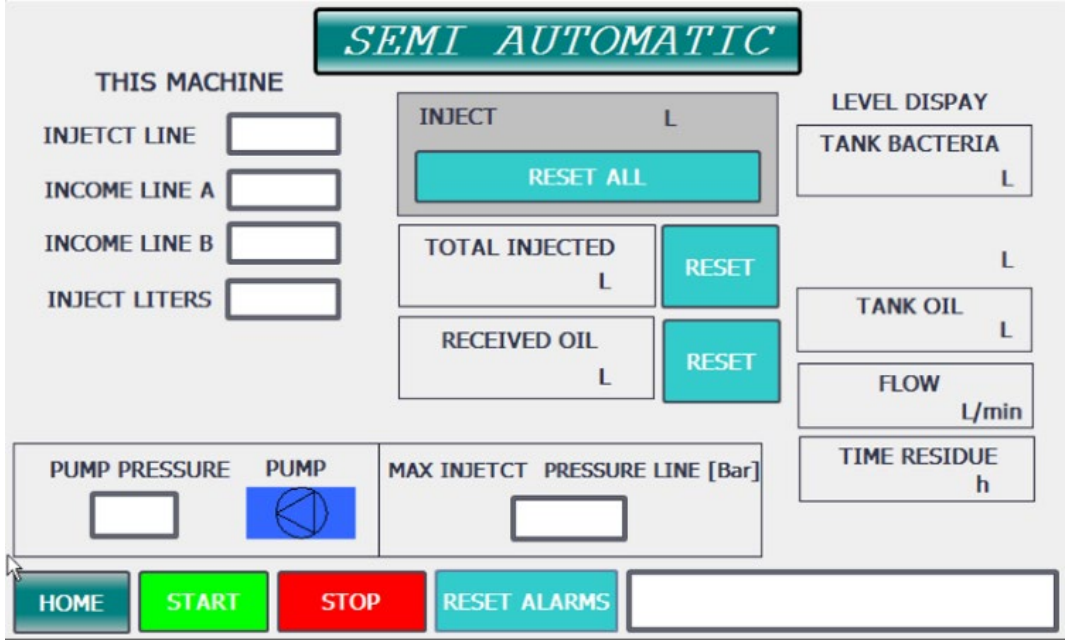
Same risk group as yogurt

* *European Directive 2000/60/EC*
European Directive 2006/123/EC
European Directive 91/676/EC
AwSV German 2017

ODB System® is equipped with management software for **remote**, real-time **monitoring of** plant operation.

Injections are monitored online, where the parameters tracked can be used to set **alarm thresholds** and trip the system in the event of anomalies.

At the end of the treatment process, **100% of the environmental risks are neutralized**, and no further oil contamination of the soil is possible.



***ODB System V.2023* management interface used to remotely control injections and monitor operations**

ODB SYSTEM®
ADAPTATIVITY

The ODB System® solution is **modular** and offers different combinations.

Installations are sized on a project-by-project basis according to the specific characteristics of the link, including :

- Accessibility to link ends
- Cable length and cross-section

Indoor installation of ODB System® in a building

Unloading an ODB System® installation, pre-assembled in a 20’ maritime container

ODB SYSTEM®
SUMMARY & KEY FIGURES

Biodegradation of transformer oils: a market first

The only **100% natural**, **safe** and legally **compliant** solution.

A **patented**, **certified** solution with highly selected bacteria, making decontamination highly effective.

A **turnkey** solution that can be implemented in the toughest environments.

Over 15 years' experience and successful international projects

Over 150 km of oil cables treated

More than 30 projects in Europe (Germany, England, France, Norway, Netherlands, Switzerland)

ODB SYSTEM®
SUSTAINABILITY

ODB System® **saves** at least **267 tonnes of CO2 per km** of cable processed.

For a complete excavation in an urban area of 1 km with an average width of 1m

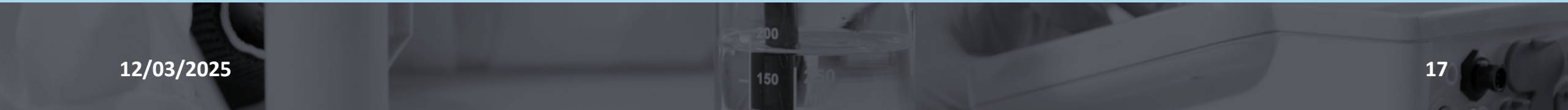
Savings equivalent to :

100,000 liters of fuel oil

133,500 m³ of gas

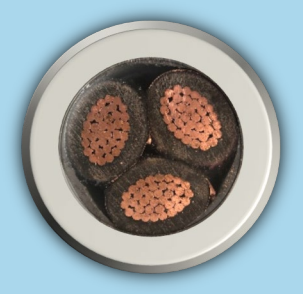
267 Paris-New York **round trips**

3,700,000 km in a small city car



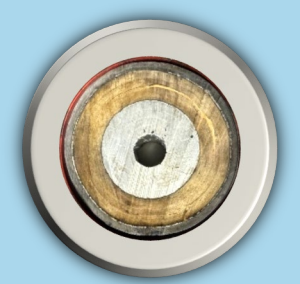
STUDY CASE 1
Industrial context

Single-phase 63 kV cables
Length 2.17 km
16-week treatment



STUDY CASE 2
Urban context

110 kV three-phase cable
Length 3.20 km
14-week treatment



STUDY CASE 3

Sensitive context - protected area

60 kV single-phase cables
Length 1.45 km
16-week treatment

TIBIO

THANK YOU

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