SANERGRID®

ENERGIES · ENVIRONNEMENT · SAFETY

RISK MANAGEMENT SOLUTIONS

FOR OIL TRANSFORMERS

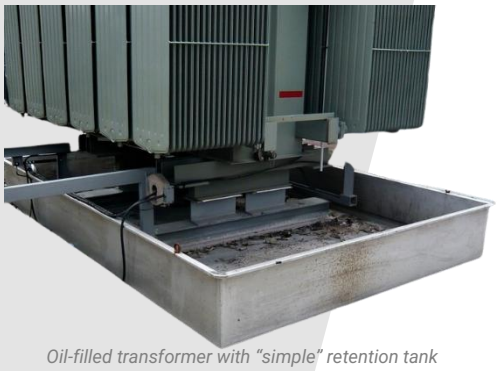
CONTAINMENT EXPERTS

GROUND, WATER, FIRE.

FORM0013-A | Ind.: 02

OIL TRANSFORMER RISK MANAGEMENT

Retention solutions | Passive fire protection | Drainage systems for polluted rainwater



Oil-filled transformer with "simple" retention tank TRT®-W oil bund without suffocating cover for storage

SANERGRID® have developed unique expertise in the design and manufacture of containment and passive fire extinguishing solutions for electrical transformers. Our innovative technologies, in-house design office, dedicated factories, and experienced project managers are here to support you in tackling environmental and safety challenges throughout the entire lifecycle of your transformers — **from manufacture and transport to storage, commissioning, and end-of-life dismantling.**

1. GROUND CONTAMINATION RISK: TOTAL RETENTION SOLUTIONS

Electrical transformers are fulfilled with dielectric oil, (hydrocarbons). To prevent oil spill they must be equipped with retention systems capable of holding a volume equal to a **minimum of 100% of the oil they contain**.

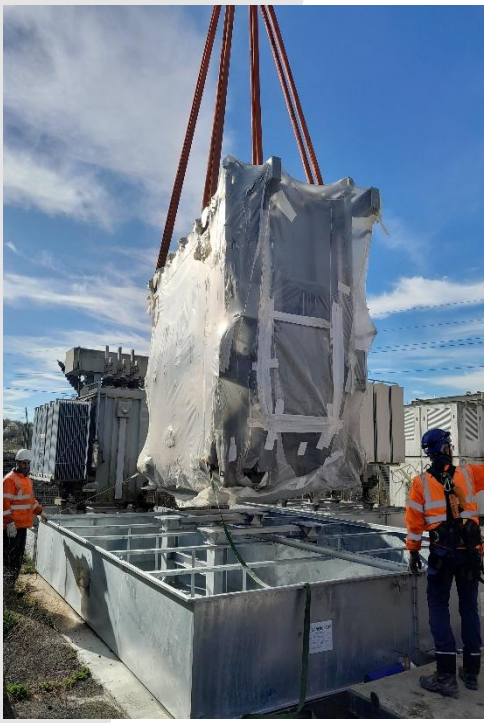
Therefore, SANERGRID® has designed a complete range of containment solutions for energized or disconnected transformers (example: storage)

1.a. Metallic retention tanks: comply with standards, robustness & durability

Ranges BDRG and BDRSA: Tanks with 2, 3 or 4 removable walls, so that the transformers can be rolled into the tank and the fronts closed tightly afterwards.

Ranges TRT® and TRT® MODULO: Fully welded watertight containment tanks

- With or without supporting beams to raise up the transformer above the ground
- Hot-dip galvanized to ISO standard EN1461-2022 for high corrosion resistance
- In monobloc or modules in order to fit into a regular truck width



TRT®-MODUL- 2 : 2 x TRT assembled together to accept power transformer oil volume for long term storage - SNCF

BDRG2 oil containment tank with 2 panels that can open in order to roll the transformer without use crane

TRT®-SP equipped with raised beams, rail in order to roll the transformer and gratings for safety maintenance area

1.b. Flexible retention tanks or berms: manage with flexibility the oil spill risk

The flexible containment tanks technology **TRFLEX** has been designed by SANERGRID thanks to a unique high-tech tarpaulin, and allows you to store for short, mid or long term your power transformer in oil, indoor or outdoor conditions, while complying with environmental standards on hydrocarbon discharge for your transformers and heavy machinery filled with dielectric oils.

Ranges TRFLEX® ECO | REFOR | ECO+ | ECO-TRUCK | ECO-MAINTENANCE:
Robustness, simplicity and high resistance to mechanical and chemical stress and ultraviolet rays for long or very long-lasting wear, depending on the model

- Internal braided core, reinforced in both directions with polyester for enhanced mechanical strength,
- Double-sided PVC coated tarpaulin grammage from 800g/m² to 1450g/m²
- Complete seal thanks to our unique double-sided ultrasonic welding process
- Angled metal structures, geotextiles and accessories for a turnkey solution
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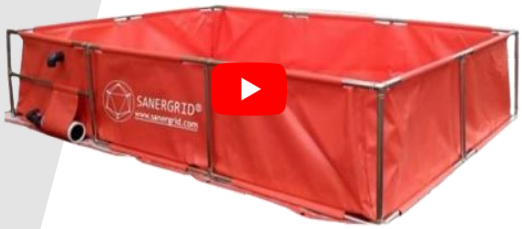
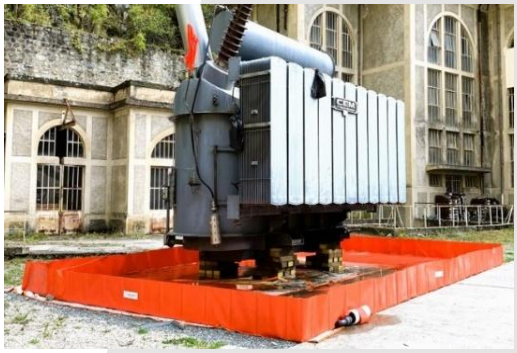
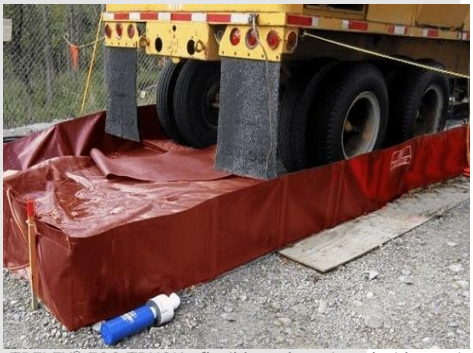


TRFLEX®-REFOR flexible containment, reinforced with metallic tubular structure design for outdoor transformer storage



TRFLEX®-ECO+ with SPI® PETRO-PIPE filter: high mechanical resistance tarpaulin with special geotextile for long term outdoor storage.



TRFLEX®-ECO TRUCK™ flexible tank equipped with special rolling tracks anti-puncture. Tank equipped with SPI® PETRO-PIT filter for continuous drainage

TRFLEX®-ECO MAINTENANCE : flexible tanks with non-slip gratings for oil filled transformers accessories storage (bushings, HV switchgear…)

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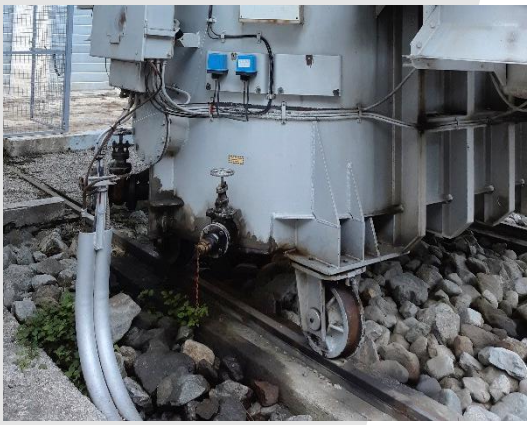
2. PASSIVES FIRE PROTECTION

Historically, oil pits were often in concrete, filled with pebbles or stones to “suffocate” the fire. After a few years, these stones become almost impossible to clean, become slippery or clogged and blocked by dirt and sludge, preventing fluids from entering the pit and compromising the fire-extinguishing performance of the pebble-filled containment system.

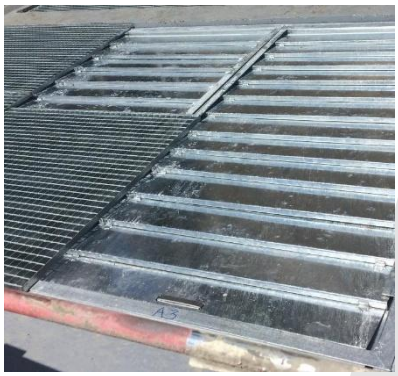


Typical oil transformer containment pit with stones and pebbles after couple of years: oil contamination, organic debris and dirt…

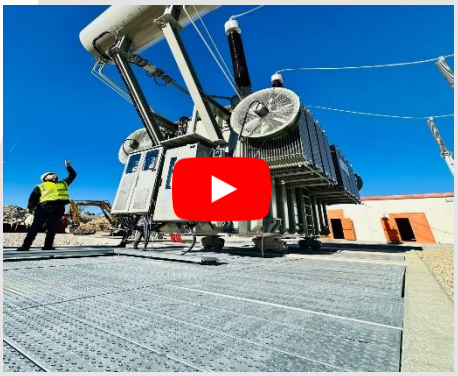
Over the years, SANERGRID® has developed unique expertise: **Passive fire-extinguishing cover for hydrocarbon fires**. Indeed, to achieve this result, we act on the phenomenon known as "hydrocarbon pool fire risk" by simultaneously addressing the three parameters of the fire triangle.

1. **Oxidize**r: Prevent renewal of O2 (Oxygen)
2. **Fuel :** Prevent fuel stagnation (Hn-Cx-Oy) (dielectric oil)
3. **Temperature** : Avoid thermal runaway (T) .(exponential heat increase)

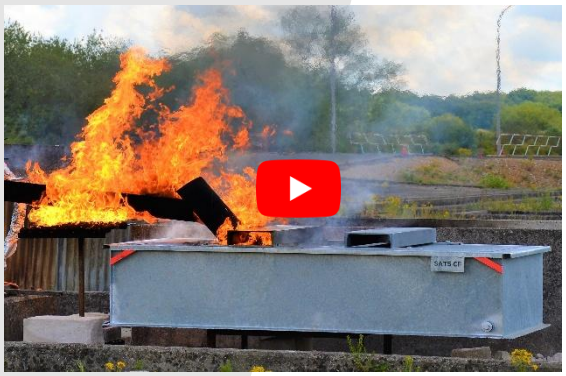
2.a. Our EXTICOV® fire-suffocating covers EXTICOV®-CCF™ and EXTICOV®-LHD® offer a simple, reliable, and robust system that is ready to use, requiring minimal maintenance. These “covers” are installed directly beneath electrical transformers, whether in existing or newly constructed concrete containment pits, using specially designed angles and support beams. Anti slippery, they allow also easier access into the concrete pit and simplify maintenance and cleaning operation.



EXTICOV®-CCF™ fire suffocating slats with non-slip gratings, perfect for indoor use

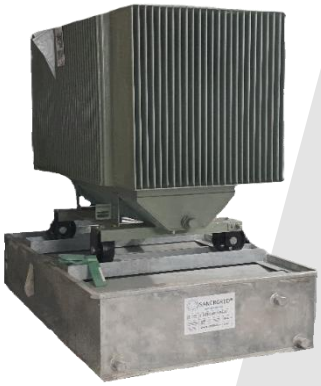


EXTICOV®-LHD® fire suffocating gratings cover, high floor resistance capacity



SANERGRID tested in independent laboratories the fire suffocating properties for EXTICOV covers- and oil extinguishing tanks ERT

2.b. Our fire-extinguishing tanks are the result of combining SANERGRID®’s expertise in fire suppression with our proven know-how in hydrocarbon retention. This innovative solution offers you the unique advantage of integrating both containment and fire-extinguishing functions into a single, reliable system.

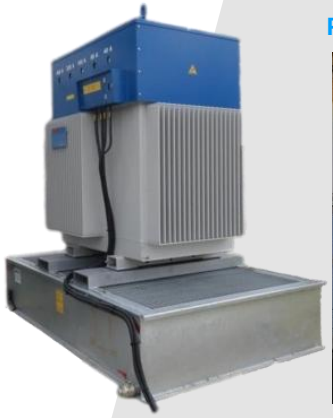


ERT-Monobloc retention tank with fire suffocating slats CCF™

Ranges ERT® & ERT®-MODULO equipped with EXTICOV®-CCF™ fire suffocating slats and gratings.

2 x ERT-MODULO 2 tank with handrail, stairs and non-slip gratings for customer that cannot dig a containment

ERT-MODULO 5 tank for photovoltaic plant in remote area and need to create containment in less than 2 hours



TRT-LHD : Monobloc retention tank with fire-suffocating gratings LHD®

Ranges TRT®-LHD & TRT®-LHD-MODULO equipped with EXTICOV®-LHD® fire-suffocating gratings.

TRT®-LHD-MODULO 3 extinguishing retention tanks with rails to roll transformer on it, and SPI PETRO PIPE filtration system for mineral oil

TRT-LHD-MODULO 3 retention tank with handrail equipped with filters PETRO PIPE MIDEL 7131for synthetic oil

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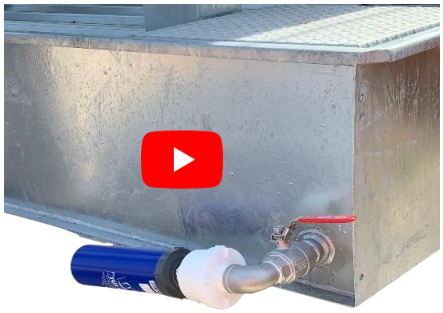
3. DRAINAGE & DEPOLLUTION OF RAINWATER: over 30 years of expertise

The SANERGRID® Group is the European subsidiary of **S.P.I.,** the inventor and global leader in hydrocarbon filtration solutions.
How can you evacuate rainwater from your retention areas simply, autonomously, and safely, while avoiding the risk of hydrocarbon or dielectric fluid pollution? Our SPI® anti-hydrocarbon filters provide an effective response to this challenge by performing three key functions:

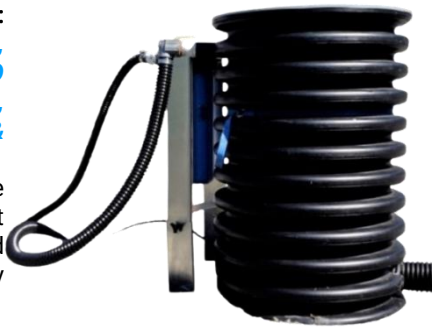
1- **Drainage:** The filter, installed at the lowest point of your retention area or connected to a pump, continuously evacuates rainwater.
2- **Filtration:** In the presence of oil traces, the SPI® filter allows water to pass through while absorbing pollutants via a unique chemical process known as "tackifying". This reaction solidifies hydrocarbons, achieving a discharge level of less than 5 ppm, in full compliance with EN 858-1 and the Water Act.
3- Blocking: When an oil leak becomes excessive or the filter reaches saturation, the active material within the filter solidifies entirely, preventing any fluid from escaping into the environment.

This solution enables you to safely drain flexible or metal tanks, concrete containment pits, or new or existing subterranean remote pits, sum pump or bund guard systems, all while reducing your waste treatment volumes and associated costs, and offering excellent operational flexibility.



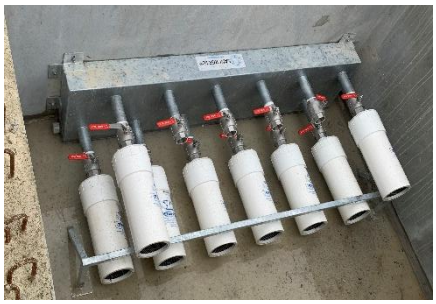
PETRO PIT 416 anti-hydrocarbon filtration kit with elbow, valve pre filter and filter connected to a ERT fire suffocating tank SANERGRID

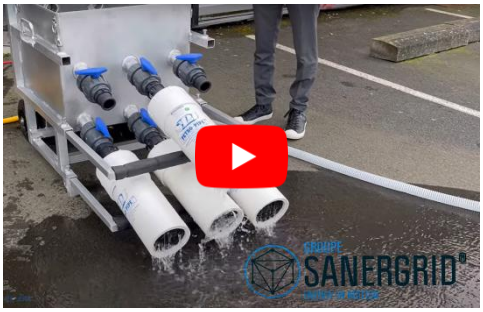
SPI® Gravity Filters: Ranges: *PETRO PIPE, PETRO PIT, PETRO BARRIER, PETRO PLUG, STORM BARRIER & SKID PIPE*
Cartridges or skids are installed at the lowest points of pits and operate by gravity drainage.



Pumped hydrocarbon filtration system PETRO-BARRIER

SPI® pumped filters: Ranges PETRO BARRIER PUMP & PETRO PIPE PUMP
Special solutions connected to sum pump, bund guard pumps or alarms detectors to guarantee <5ppm concentration of hydrocarbons





PETRO PIPE POMPE mobile pumping vault and pit

4. SANERGRID® CSR Policy, Certifications, and Standards

Since 2020, the SANERGRID® Group as manufacturing engineering, has implemented a Corporate Social Responsibility (CSR) policy built around 3 core pillars: **Reducing industrial waste, promoting social diversity and employee well-being, and lowering carbon emissions throughout our value chain**
This is why our manufacturing facilities for EU market, are located in France, Spain, Denmark, and across Western Europe, strategically positioned to support short supply chains and minimize the carbon footprint associated with production and logistics.
In recognition of our commitment to excellence and sustainability, our factories are:

- quality management systems certified to ISO 9001
- environmental management practices meeting the requirements of ISO 14001

These certifications reinforce SANERGRID®'s ongoing dedication to responsible innovation, product reliability, and sustainable industrial practices.

• Our retention solutions comply with most European and international standards *(including NF C13-100, NF C13-200, EN 61936-1, CIGRE 23-07 recommendations, and IEEE 980, covering the management of electrical risks, earthing, fire hazards, soil contamination, and rainwater control etc…).*

• SONEC®'s EXTICOV®-CCF™ and SANERGRID®'s EXTICOV®-LHD® fire-suffocating covers have been tested multiple times in independent laboratories *(including CNPP, MFPA Leipzig (Report No. GU IV/99-011-1, Germany), and SP Technical Research Institute (Report No. 5P05551, Sweden)).*

• Our SPI® rainwater drainage systems comply with the French Water Act (Decree 77-254), the ICPE decree, and the EN 858-1 standard for hydrocarbon separator discharges. SPI® filters have been regularly tested by independent laboratories for over 30 years *(Bureau Veritas COFRAC (I.D. Report: 003606/2776443/1/1/1, France, 2015)– SPI Phoenix (I.D. Reports: AR67044 in 2002, 2004, 2005, 2009, 2018, 2022, USA)– TÜV (Report No. 2432974, Germany, 2016) etc… and are regularly re-tested in independent laboratories…)*

SANERGRID®, a company from GROUPE SANERGRID® ENERGY IN MOTION

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