COMPACT HEAT RECOVERY & FLUE GAS CLEANER IN ONE
FOR USE IN INDUSTRIAL APPLICATIONS
TERRAOSAVE® is a filter which is an investment and not just a cost. The return on investment period is between 5-10 years, depending on the installation parameters and the demand for heat recovery.

TERRAO® Exchanger

A REVOLUTION IN FLUE GAS CLEANING ON AN INDUSTRIAL SCALE

One device that filters the flue gases and recovers the energy at the same time.

1st price of innovation

10 international patents!
The recycling of energy is appropriate for all flue gases, at all temperatures and compositions:

- **from 130°C to 1000°C and above:**
  - Gas combustion from furnaces, incinerators, boilers, turbines, engines
  - Sectors: glass and metals industry, cement work, steam process, waste & power plant, marine industry...

- **from 90°C to 130°C and above:**
  - Fumes from production processes, flue gases and boiler plants
  - Sectors: food industry, paper industry, chemical, boiler rooms, district heating

- **from 70°C to 90°C and above:**
  - Steam from production processes
  - Sectors: food industry, paper industry, chemical industry

- **from 30°C to 60°C:**
  - Hot air generated by the drying process, moist air produced in technological processes
  - Sectors: food, wood, paper, cardboard, chemicals
The loss of thermal energy in the exhaust flue gases may in extreme cases be up to 40% of the total input energy, depending on the appliance and the type of fuel being used. This is energy we do not use which is expelled into the atmosphere.

By installing the Terrasave, a large part of this energy can be recovered and reused in the process, e.g. for preheating water or other energy carriers in the system.

**Typical energy split in a Gasoline Internal Combustion Engine**

- **Exhaust flue gases losses**: 40%
- **Effective power**: 25%
- **Cooling losses**: 30%
- **Friction and parasitic losses**: 5%
FLUE GAS CONDENSATION

The Terraosave solution captures and recovers the thermal energy contained in gases and exhaust fumes. The direct exchange process extracts sensible heat. What distinguishes the Terra® heat exchanger is that in addition to sensible heat, it also extracts the latent heat, which is much greater, as shown on the diagram below. In many cases, the recovered energy from a single Terra® exchanger will be up to 2.5 times greater than the traditional plate heat exchangers.

Diagram of energy consumption from water via Terra® heat exchanger (TW<TR<TS)

Terraosave may recover up to 50% of the appliance output from the latent heat energy of flue gases that would otherwise be wasted.
A UNIQUE FILTRATION SYSTEM
WITH A RETURN ON INVESTMENT

Innovative technology based on thermodynamic technology mixing flue gases with water.

Terraosave captures and injects exhaust fumes into the water or to another fluid commonly used for purification.

This unique device provides at the same time:

- **Flue gas cleaning:** Pollutants from the flue gases are filtered by a proportionate volume of liquid.

- **Energy recovery:** Both explicit and implicit energy from the exhaust gases are transferred through the water.
TERRAOSAVE® technology – significantly reduces contamination levels emitted into the atmosphere:

**Fine Particles (PM$_{2.5}$ PM$_{10}$)**
- Efficiency $>85%$

**Volatile Organic Compounds (VOC)**
- Efficiency $>85%$

**NITROGEN OXIDES (NO$_x$)**
- Efficiency $>55%$

**SULPHUR OXIDES (SO$_x$)**
- Efficiency $>85%$

Terraosave® can additionally neutralize acids and reduce the amount of particulate matter.
It’s reasonable these days to be prepared for energy shortages and increased costs.

The recovered heat energy is clean and it doesn’t cause additional CO₂ emissions.

In addition to providing constant, sustainable energy Terrao® technology contributes to the improvement of air quality, ensuring that the industry around us will be more sustainable, more efficient and more environmentally friendly.
WHY IT’S WORTH CHOOSING TERRAOSAVE® TECHNOLOGY?

- Up to 2.5x higher energy recovery compared to traditional heat exchangers
- Compact size for one module 5000 Nm³/h
  - Height approx. 2 m, width 2.9 m, depth 1.7 m
- Energy recovery from the latent heat a total of 50% to 90% of the energy
- Can be combined in cascades depending on the size of the installation
- High filtration efficiency PM₂.₅, PM₁₀, NOₓ, SOₓ, VOC, heavy metals
- Easy to maintain and high availability
- Possibility to apply for a grant
- Friendly service does not require boiler shutdown
- Can be retrofitted
- Stops pluming at chimney outlet

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WOOD SHIPS BOILER
ZAANDAM, NETHERLANDS

Heat Recovery and Nox filtration from biomass exhaust gases from the boiler room for the local district heating
- Boiler capacity: 2 MW
- Heat Recovery: 400 KW (gain of 20%)
- Nox emission level (output): 35 mg/Nm$^3$ (reduction of 50%)

PELLET BOILERS
VERBIER, SWITZERLAND

Heat Recovery and Dust filtration from biomass exhaust gases from boiler room for the local district heating
- Boilers capacity: 2 x 1.25 MW
- Heat Recovery: 800 KW (gain of 32%)
- Dust emission level (output): 20 mg/Nm$^3$ (reduction of 90%)

GAS STEAM BOILER
AMIENS, FRANCE

Heat Recovery from exhaust gases from a steam production’s boiler to preheat the process water
- Boiler capacity: 20 MW
- Heat Recovery: 800 KW (gain of 10%)
DISTRICT HEATING BOILER ROOM
CREIL, FRANCE

Heat Recovery from exhaust gases from district heating boiler room

- Boiler capacity: 3 MW
- Heat recovery: 1 MW (gain of 33%)

UNEAL FACTORY
PAS-DE-CALAIS, FRANCE

Recycling of the energy from the fumes of a steam boiler to heat the molasses stored in a 35 ton tank

- Boiler capacity: 1 MW
- Heat recovery: 100 kW (gain of 10%)

TERRAOSAVE® uses 100% innovative Terrao® direct exchange technology.
Recovering latent energy through thermodynamic mixing is exclusive and patented know-how.

The information contained in this brochure is correct at the time of printing. The most up-to-date information is contained in the current product certificate. They are available on our website or from our Technical Advisor. Errors and omissions in printing are reserved.
The Poujoulat Group exports to 30 countries and has 19 companies in 9 countries: France, Germany, Switzerland, Denmark, Belgium, the UK, Holland, Poland and China.