



# Environmental Technology for the Industry

EXHAUST AIR TREATMENT  
WASTE INCINERATION

**COMPANY & TECHNOLOGY PRESENTATION**

BARCELONA | SEPTEMBER 2016 | Version 3

ISO 9001  
BUREAU VERITAS  
Certification



## Environmental Technology for the Industry:

- **Exhaust Air Treatment**
  - Volatile Organic Compounds (COV), NOx
- **Waste Incineration**
  - Solid & Liquid Waste, Sludge

### Milestones & History

- 2005 - Founded in Barcelona, Spain
- 2006 - First international customer
- 2010 - International expansion commenced
- 2011 - Moved to larger facilities
- 2012 - 70% revenue increase in comparison to 2011
- 2013 - Opening of Sales Office in Moscow, Russia
- 2014 - Opening of Sales Office in Santiago, Chile
- 2015 - Opening of Sales Office in Beijing, China

### International Presence:

Headquarters: Barcelona, Spain

Sales Offices: Moscow, Russia  
Santiago, Chile  
Beijing, China

Complete Project Management, including:

**Engineering & Design | Production | Installation | Commissioning | Maintenance Service**

## Exhaust Air Treatment

- Regenerative Thermal Oxidizer (RTO)
- Regenerative Catalytic Oxidizer (RCO)
- Adsorption systems (Zeolite Rotor-concentrator)
- Thermal Oxidizers (TO)
- Active Carbon Filters
- DeNOx systems:
  - Selective Catalytic Reduction (SCR)
  - Selective Non-Catalytic Reduction (SNCR)
- Heat Recovery systems
- Wet scrubbers
- Venturi-scrubbers
- Bio-filters
- Energy Efficiency systems
- Gas coolers
- Particle separators
- Ventilation Air Methane (VAM) for Mines



## Industrial Waste Incineration

- Static Incinerators
- Rotary Incinerators
- Incineration Systems and Plants for:
  - Solid & Liquid Waste
  - Hazardous Waste
  - NORM Waste
  - Refining Residues
  - Waste Water Plant
  - Sludge
  - Etc.



# Exhaust Air Treatment



## Exhaust Air Treatment

VOC emissions are currently issued into the atmosphere in a large number of production processes that use organic substances. Current EU and national legislations establish maximum VOC emission limits for the various production processes affected.

### Technologies to eliminate VOCs & Odours:

- Oxidizers
- Adsorption Asystems
- DeNOx Systems
- Filters
- Scrubbers
- Energy Efficiency Systems



### A Global Problem:

VOC emissions are one of the biggest environmental problems for many Industries nowadays.

Global warming generated by VOC emissions is 12 times higher than that produced by CO<sub>2</sub>.

## Applications & Processes:

- Painting & Spraying Booths
- Industrial Finishing
- Coating Processes
- Chemical Processes
- Plastic & Rubber Production
- Pharmaceutical Processes
- Etc.

### INDUSTRIES:

Chemical | Petrochemical | Automotive  
Pharmaceutical | Oil & Gas | Packaging  
Flexographic | Coating | Mining | Etc.



## OXIDIZERS

### Regenerative Thermal Oxidizer (RTO)

#### Designed for:

- Air Volumes from 2,000 to 100,000 m<sup>3</sup>/h
- Medium to High Solvent Concentrations
- Wide Range of Solvents

#### Technology Advantages:

- Adaptable for Small, Medium and Large Air Flows
- Wide range of VOC emissions to be treated
- Low Operating and Maintenance Cost
- High Thermal Efficiency
- Does Not Generate Any Waste
- Heat Recovery generated for External Processes

#### Technical Characteristics:

- Maximum solvent concentration: 11,000 mg/Nm<sup>3</sup>
- Solvent concentration for auto-thermal operation: 1.3- 1.7 g/ Nm<sup>3</sup>
- Operating temperature of the equipment: 750°C
- Maximum outlet concentration
- Long life ceramic media
- 200 mm internal isolation for energy saving
- Thermal Efficiency > 98%

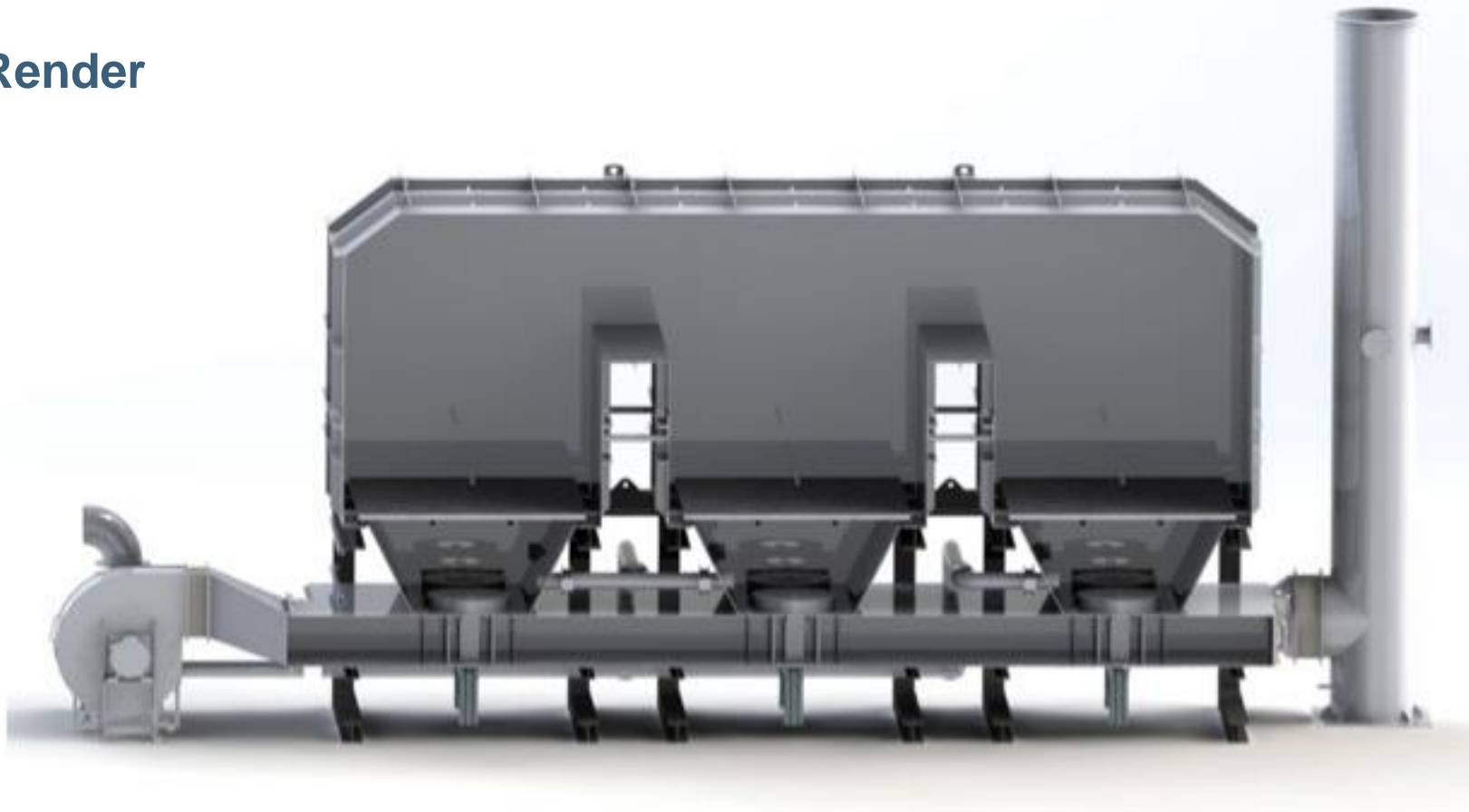




# OXIDIZERS

## Regenerative Thermal Oxidizer (RTO)

### Equipment Render





## OXIDIZERS

### Regenerative Catalytic Oxidizer

#### Designed for:

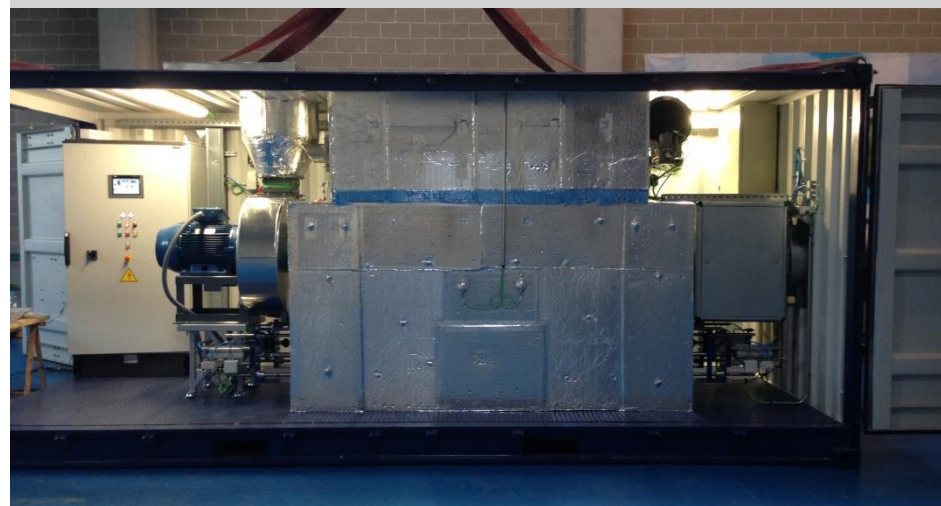
- Air Volumes from 1,000 to 30,000 m<sup>3</sup>/h
- Low to Medium Solvent Concentrations

#### Technology Advantages:

- ✓ Compact Solution – Does Not Require Much Space
- ✓ Lower Operating Cost than other Solutions for VOC emissions treatment
- ✓ Combustion Gas Treatment
- ✓ Does not Generate any Waste

#### Technical Characteristics:

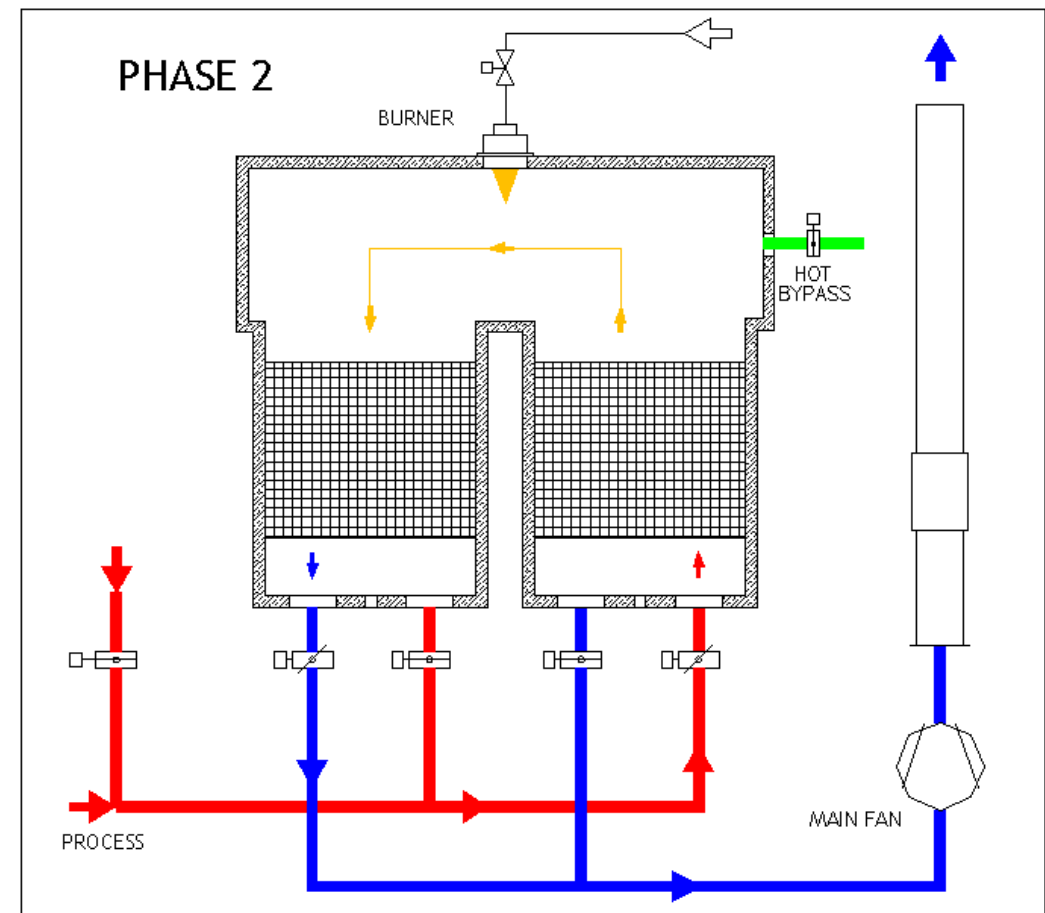
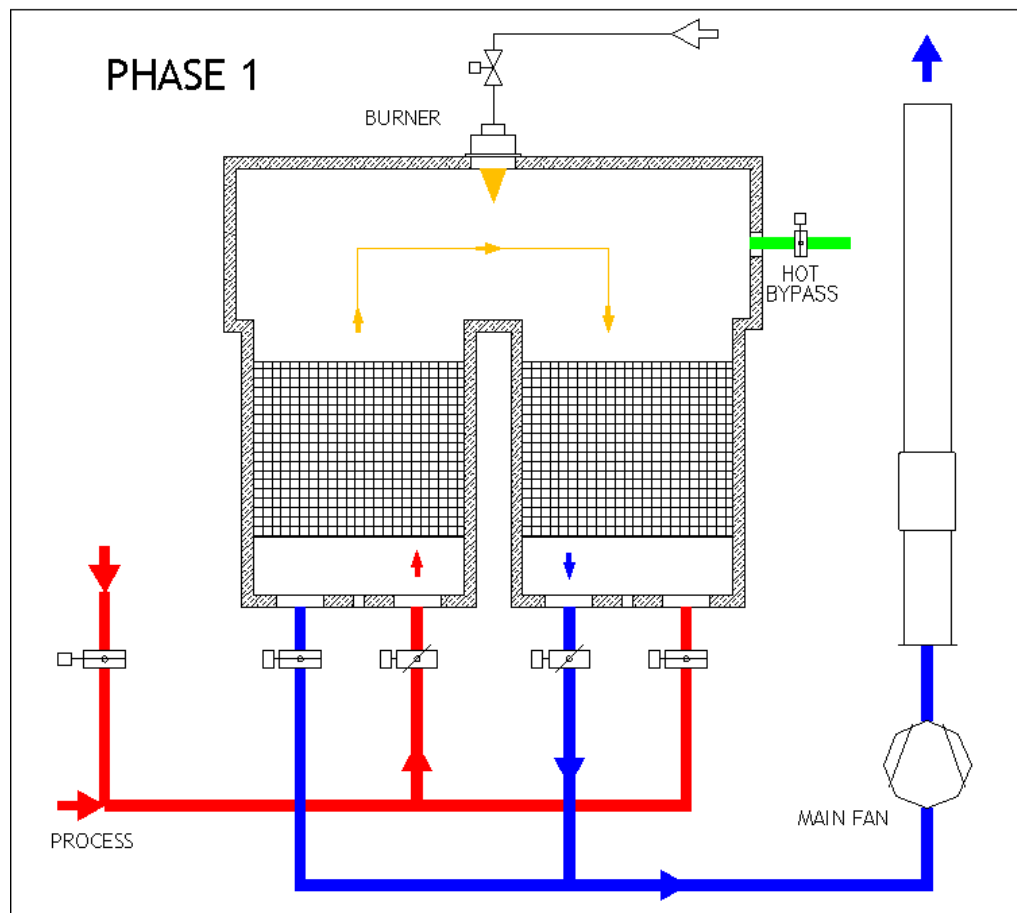
- Auto thermal point 0.6-0.8g/Nm<sup>3</sup>
- High efficiency of the heat exchanger 98 %
- No gas consumption at auto thermal point
- Long life catalytic material
- Full automatic operation
- Low operation cost
- Easy Installation
- Installed inside a 20- or 40-feet container



## OXIDIZERS

### Regenerative Catalytic Oxidizer (RCO)

### Equipment Diagramme



## ADSORPTION

### RTO + Zeolite Rotor-concentrator

#### Designed for:

- Large air volumes containing small VOC concentration

#### Technology Advantages:

- ✓ Allows large volumes of air to be treated: up to 200,000 Nm<sup>3</sup>/h per each rotor-concentrator
- ✓ Low operating consumption
- ✓ Low gas and electricity consumption
- ✓ Low annual maintenance cost
- ✓ Lower implementation cost than other purification technologies

#### Technical Characteristics:

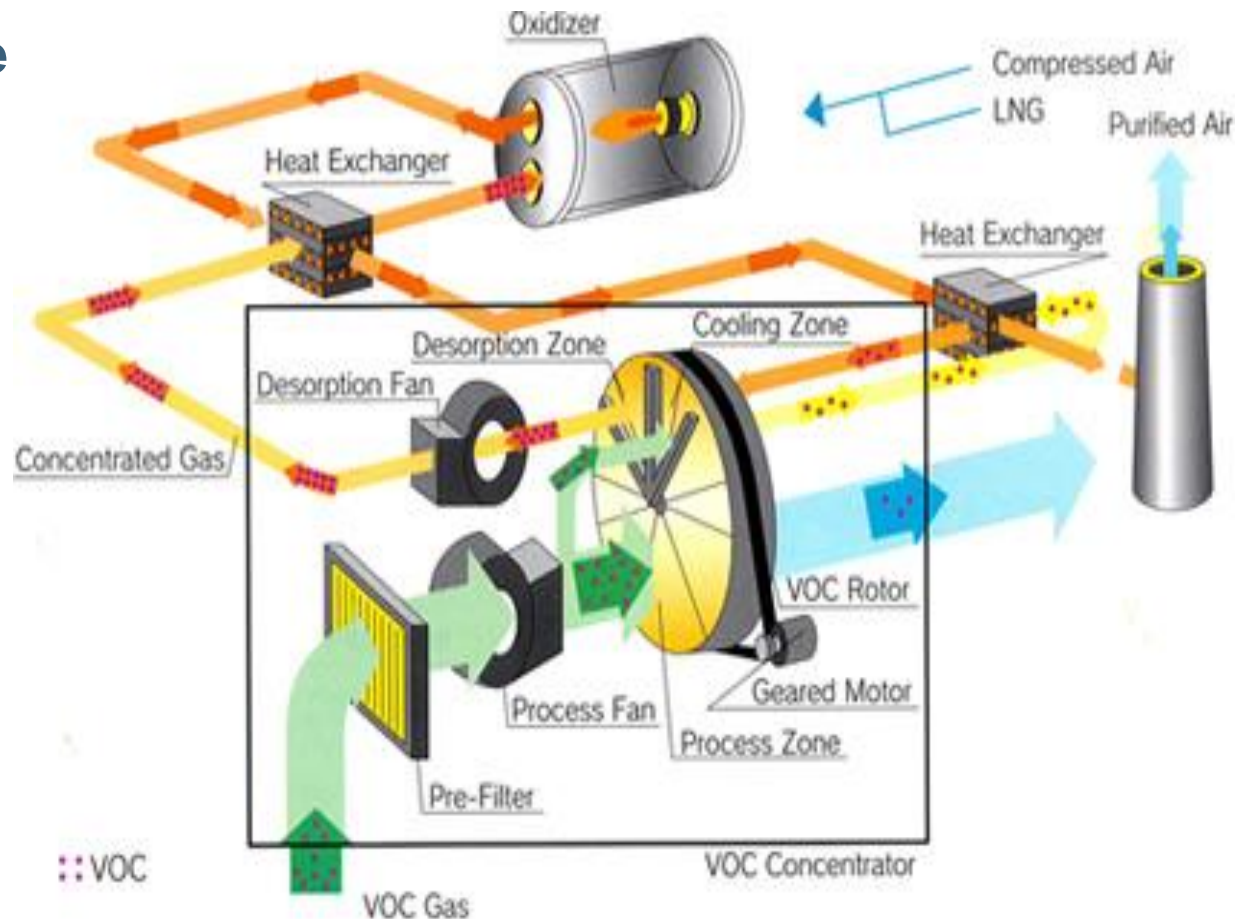
The Zeolite Rotor-Concentrator equipment is always installed along with a posterior oxidizer system, Regenerative Thermal Oxidizer RTO, to oxidize the flow of concentrated air previously sent from the concentrator. The aim is to send an air flow between 15 to 20 times lower than the initial volume to be treated with a sufficient VOC concentration for the purification equipment to be auto-thermal.



## ADSORPTION

### RTO + Zeolite Rotor-concentrator

#### Process Diagramme





# Industrial Waste Incineration

## Waste Incineration Technologies

Waste Incineration undergoes the strictest and more demanding controls, thus resulting in a **safe** and **efficient** solution for industrial waste management. Moreover, this technology also brings cost savings through **waste self-management** and **waste-to-energy** options.

### Technologies:

- Static Incinerators
- Rotary Incinerators
- Incineration Plants

### INDUSTRIES:

Chemical | Petrochemical | Oil & Gas  
Pharmaceutical | Mining | Etc.



### Industrial Applications:

- Solid & Liquid Waste
- Hazardous Waste
- NORM Waste
- Refining Residues
- Waste Water Plant Sludge

## **STATIC INCINERATION SYSTEMS: G-MODEL SERIES**

### **Main Features:**

- Static unit (low maintenance cost)
- Batch Load unit (adaptable to daily needs)
- 45kg/h; 150kg/h; 380 kg/h
- Two Incineration Chambers
- Full automatic operation cycle (doesn't need specialized operators)
- Fulfills all the EU Environmental Standards
- Produced under ISO and CE Standards
- Very competitive prices



### **What kind of waste can be incinerated in a G Model?**

- ✓ General Waste
- ✓ Hospital Waste
- ✓ Animal Carcasses and remaining

## G-MODEL SERIES

### Who can benefit from a G-Model Incineration System?

#### **Isolated Communities**

- ✓To avoid dump residues and contaminate the surrounding nature

#### **Hospitals and Clinics**

- ✓To spare money with the collecting companies
- ✓To avoid spreading diseases while transporting the waste to a landfill

#### **Ports and Airports**

- ✓To destroy organic residues brought from potentially contagious areas
- ✓To destroy unauthorized imported foods or plants
- ✓To destroy apprehended drugs or illegal medicines

#### **Slaughterhouses**

- ✓To destroy carcasses positive to dangerous diseases: Tuberculosis, Foot and Mouth disease, etc.

#### **Ministry of Agriculture**

- ✓There is a Portable version to provide quick response to disease outbreaks (rabies, bird flu...)

#### **Investigation Laboratories**

- ✓To destroy dangerous contaminated material



## STATIC INCINERATION SYSTEMS: AR-MODEL SERIES

### Main Features:

- Static Unit with sliding movement inside
- Continuous operation
- 700kg/h to 1.600kg/h
- Two Incineration Chambers
- 4 incineration cells in the Primary Chamber
- Automatic waste load
- Automatic ash removal
- Full automatic operation cycle (doesn't need specialized operators)
- Fulfils all the EU Environmental Standards
- Produced under ISO and CE Standards



### Who can benefit from a AR-Model Incineration System?

#### Hospital Waste Management Companies

- ✓ This is a model specially designed to deal with Hospital Waste
- ✓ The basic concept behind its engineering is the maximal bio-security for less cost
- ✓ It is designed to deal with Hospital Waste that is delivered in cardboard boxes or plastic containers.

## ROTATING INCINERATION SYSTEMS: SK-MODEL SERIES

### Main Features:

- Rotating Drum Unit
- Continuous operation
- 50kg/h to 2.000kg/h
- Two Incineration Chambers
- Automatic waste load
- Automatic ash removal
- Full automatic operation cycle  
(doesn't need specialized operators)
- Fulfils all the EU Environmental Standards
- Produced under ISO and CE Standards

### What kind of waste can be incinerated in an SK- Model?

- ✓ General Waste
- ✓ Hospital Waste (especially for bulk unpacked load)
- ✓ Powders and compact low grain waste
- ✓ Liquids, pastes and sludge
- ✓ Plastics and fabrics



## SK-MODEL SERIES

### Who can benefit from a SK-Model Incineration System?

#### **Hazardous Waste Management Companies**

- ✓To avoid dump hazardous residues in the landfills

#### **Contaminated Water Treatment Plants**

- ✓To destroy the remaining, most of the times grease rich, sludge

#### **Hazardous Liquids Management Companies**

- ✓To destroy solvents remaining from industrial processes
- ✓To destroy paints remaining from industrial processes
- ✓To destroy varnishes remaining from industrial processes

#### **Oil Refineries**

- ✓To destroy the remaining sludge after the distillation process
- Petrochemical conglomerates
- ✓To destroy end of the line products, by-products or contaminated products

#### **Environmental Remediation Companies**

- ✓To clean contaminated soil from spillage or long term dump of contaminants

# Services Offered



- Preventive Maintenance
- Reparation
- Spare Parts
- Upgrades / Revamping
- On-site Commissioning Training
- Online continuous monitoring unit



# Projecte References: Exhaust Air Treatment

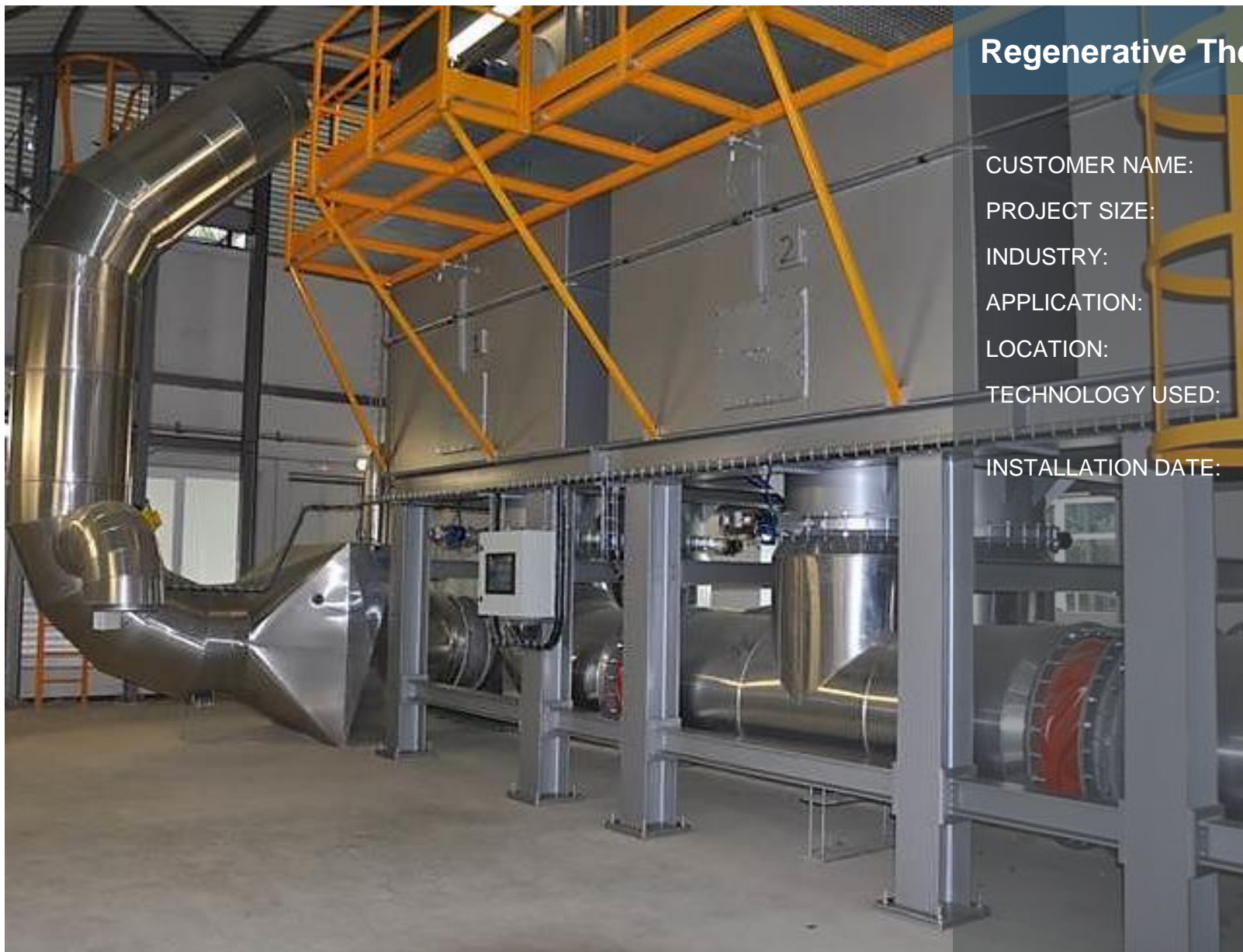


### Zeolite Rotor-concentrator + RTO

CUSTOMER NAME:	Cabycal
END CUSTOMER:	Heceygo
PROJECT SIZE:	40,000 Nm <sup>3</sup> /h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting Booths
LOCATION:	Vitoria, Spain
TECHNOLOGY USED:	Zeolite Rotor-concentrator + Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2008

- **The Customer's Technical Needs:** After moving to new facilities in 2008, Heceygo decided to focus on improving the quality of their processes as well as reducing environmental impact, in particular VOC emissions. Heceygo was looking for a reliable supplier, who could manage the whole project, from the design, assembly and installation, to the start-up and maintenance service
- **The Solution Installed:** The equipment installed at Heceygo consists of a Zeolite Rotor-concentrator together with a Regenerative Thermal Oxidizer unit. The basic operating principle of the Zeolite Rotor-Concentrator equipment is the VOC abatement by adsorption process. The adsorption takes place using a porous material called Zeolite.
- **The Result Obtained:** Thanks to Tecam Group's environmental technology, it was possible to reduce the Volatile Organic Compound VOC emissions from Heceygo's production site to levels below the legislation limits.





## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Sanofi Aventis
PROJECT SIZE:	30,000 Nm <sup>3</sup> /h
INDUSTRY:	Pharmaceutical
APPLICATION:	Pill coating
LOCATION:	Riells, Spain
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2010





## Regenerative Catalytic Oxidizer (RCO)

CUSTOMER NAME:	Cabycal
END CUSTOMER:	Fagor
PROJECT SIZE:	10,000 Nm <sup>3</sup> /h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting Booths
LOCATION:	Tafalla, Spain
TECHNOLOGY USED:	Regenerative Catalytic Oxidizer (RCO)
INSTALLATION DATE:	2010



## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Cabycal
END CUSTOMER:	SMR
PROJECT SIZE:	15,000 Nm3/h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting Booths
LOCATION:	Epila, Spain
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2011





## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	LEK Sandoz
PROJECT SIZE:	10,000 Nm <sup>3</sup> /h
INDUSTRY:	Pharmaceutical
APPLICATION:	Pill coating
LOCATION:	Menges, Slovenia
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2011



## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	LEK Pharmaceutical
PROJECT SIZE:	55,000 Nm3/h
INDUSTRY:	Pharmaceutical
APPLICATION:	Pill coating
LOCATION:	Ljubljana, Slovenia
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2012





## Regenerative Catalytic Oxidizer (RCO)

CUSTOMER NAME:	Filtracni Technika
END CUSTOMER:	Valeo
PROJECT SIZE:	30,000 Nm3/h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting Booths
LOCATION:	Zebrag, Czech Republic
TECHNOLOGY USED:	Regenerative Catalytic Oxidizer (RCO)
INSTALLATION DATE:	2012



## Regenerative Catalytic Oxidizer (RCO)

CUSTOMER NAME:	Cabycal
END CUSTOMER:	Maier
PROJECT SIZE:	12,000 Nm <sup>3</sup> /h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting Booths
LOCATION:	Gernika, Spain
TECHNOLOGY USED:	Regenerative Catalytic Oxidizer (RCO)
INSTALLATION DATE:	2013





## Regenerative Thermal Oxidizer (RTO)

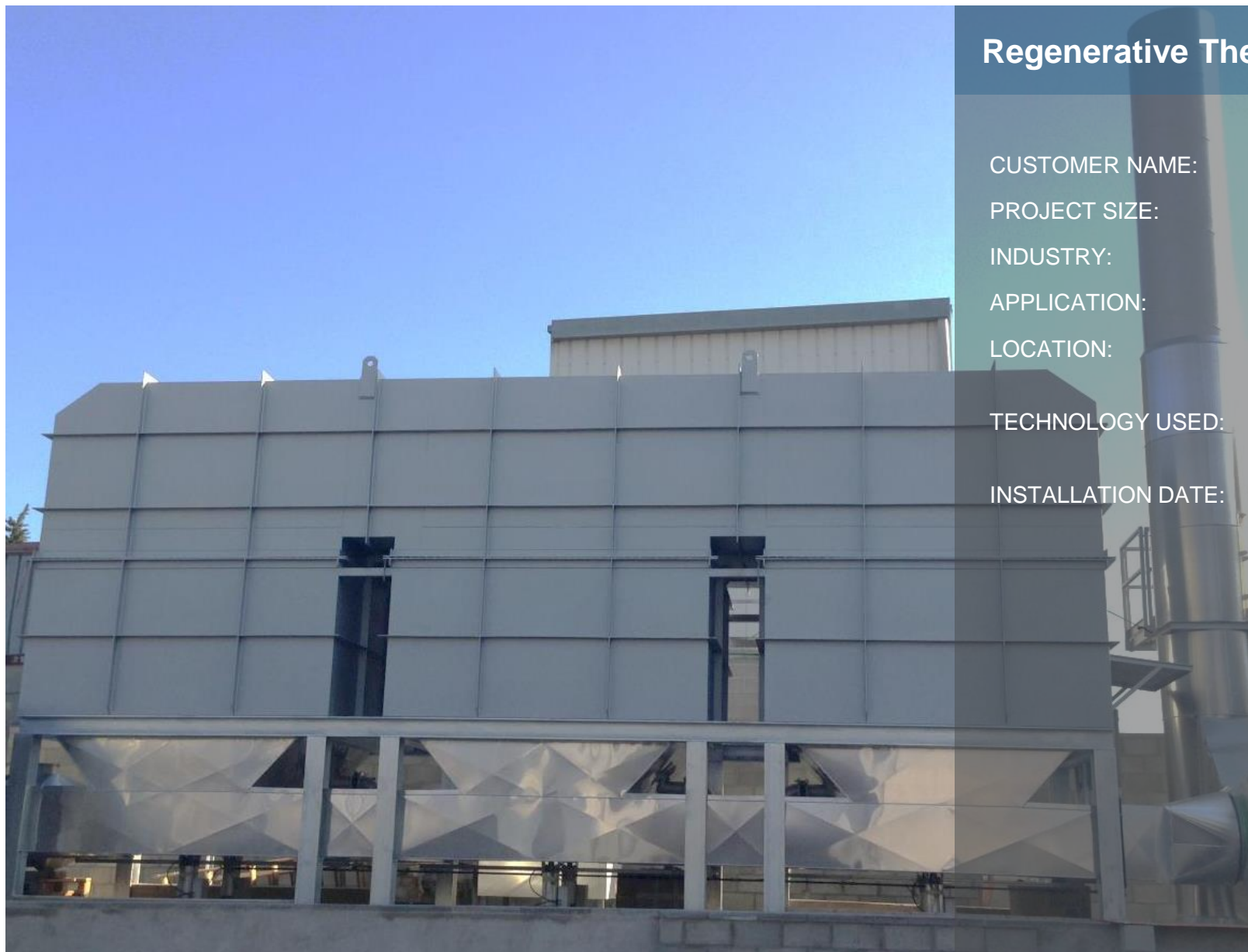
CUSTOMER NAME:	LEK Sandoz
PROJECT SIZE:	15,000 Nm <sup>3</sup> /h
INDUSTRY:	Pharmaceutical
APPLICATION:	Pill Coating
LOCATION:	Prevalje, Slovenia
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2013



### Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Vellerino
PROJECT SIZE:	30,000 Nm3/h
INDUSTRY:	Packaging
APPLICATION:	Coating
LOCATION:	Elche, Spain
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2014





### Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Witte y Solá
PROJECT SIZE:	29,000 Nm <sup>3</sup> /h
INDUSTRY:	Packaging
APPLICATION:	Coating
LOCATION:	Sant Fost de Campsentelles, Spain
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2014



### Regenerative Catalytic Oxidizer (RCO)

CUSTOMER NAME:	Manufacturas Metálicas Canals
PROJECT SIZE:	10,000 Nm <sup>3</sup> /h
INDUSTRY:	Packaging
APPLICATION:	Coating
LOCATION:	Martorell, Spain
TECHNOLOGY USED:	Regenerative Catalytic Oxidizer (RCO)
INSTALLATION DATE:	2014





## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Eskabe
PROJECT SIZE:	21,000 Nm3/h
INDUSTRY:	Thermal & Boilers
APPLICATION:	Painting Booths
LOCATION:	Mar del Plata, Argentina
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2015





## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Tallers Elpa-Replasa
PROJECT SIZE:	21,000 Nm <sup>3</sup> /h
INDUSTRY:	Plastics
APPLICATION:	Surface treatment
LOCATION:	Astrain, Spain
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2015





## Zeolite Rotor-concentrator + RTO

CUSTOMER NAME:	Mecaplast
PROJECT SIZE:	120,000 Nm <sup>3</sup> /h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting application
LOCATION:	La Pobla de Claramunt, Spain
TECHNOLOGY USED:	Zeolite Rotor-concentrator + Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2016





## Zeolite Rotor-concentrator + RTO

CUSTOMER NAME:	Cabycal
END CUSTOMER:	Plastic7
PROJECT SIZE:	90,000 Nm <sup>3</sup> /h
INDUSTRY:	Auxiliary Automotive
APPLICATION:	Painting application
LOCATION:	La Pobla de Vallbona, Spain
TECHNOLOGY USED:	Zeolite Rotor-concentrator + Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2016





## Regenerative Thermal Oxidizer (RTO)

CUSTOMER NAME:	Cederroth Distrex
PROJECT SIZE:	21,000 Nm <sup>3</sup> /h
INDUSTRY:	Consumer Goods
APPLICATION:	Painting application
LOCATION:	Bigues i Riells, Spain
TECHNOLOGY USED:	Regenerative Thermal Oxidizer (RTO)
INSTALLATION DATE:	2016

# Projecte References: Industrial Waste Incineration



## WASTE INCINERATION

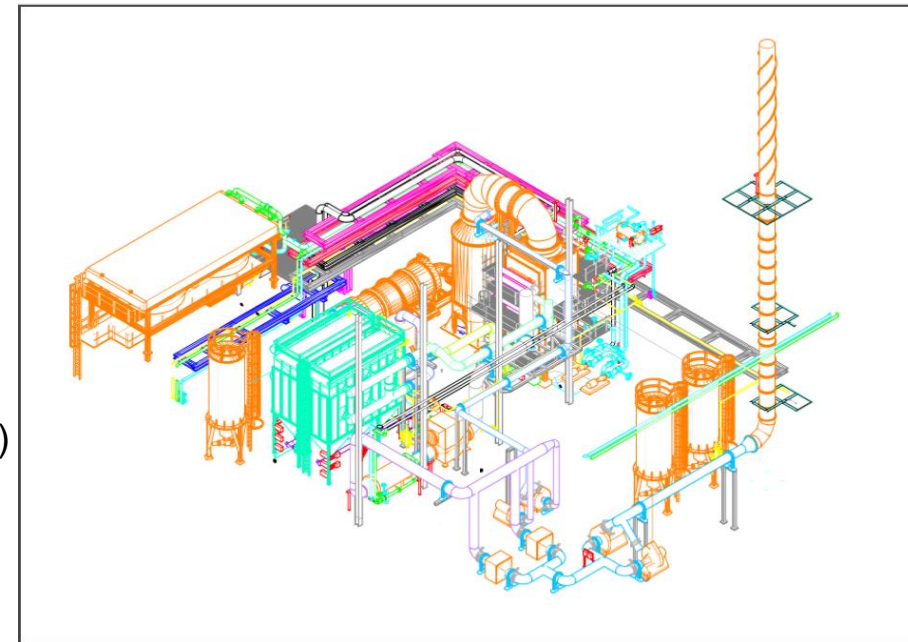


Ruwais, UAE – 2015 (in progress)

**Incineration Capacity: 500 kg/hour**

### **NORM Waste Incineration system + Gas treatment, composed of:**

- Naturally Occurring Radioactive Material (NORM) incineration, with rotating kiln
- Different compounds combination: Oil, scale and sludge waste incineration from oil refinery process
- Gases dry treatment with DeNOx SCR (Selective Catalytic Reduction)
- Heat exchanger
- Chemical dosification (Bicarbonate and Active Carbon)
- Double bag filter and HEPA filter
- System of recovery and storage of slag and ashes
- The Average Heat Value is 8.500 kcal/kg and the unit operates at negative pressure
- The system was designed to operate in a flexible way, which operates in different working ranges depending on the variable combination of the three types of waste present (Oil, scale and sludge)



## WASTE INCINERATION

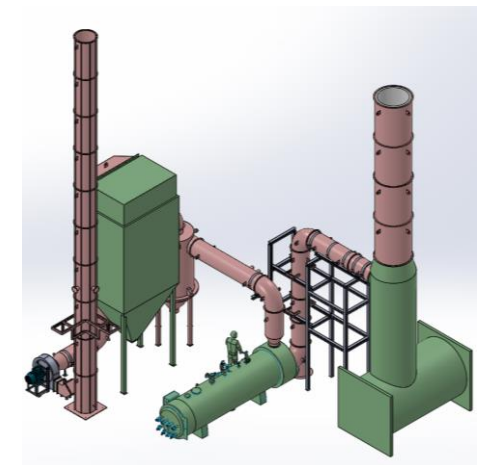
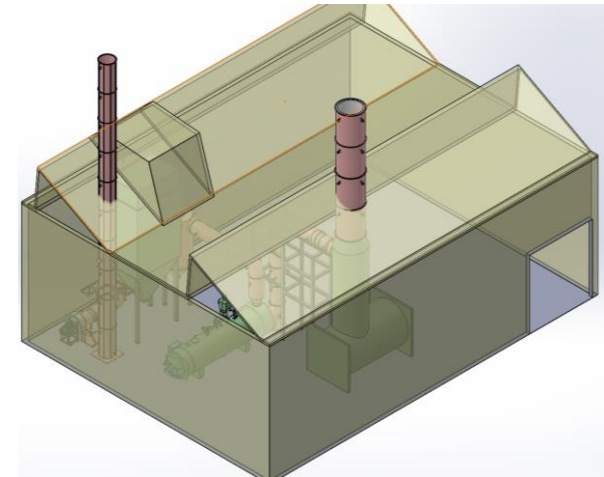


**Cáceres, Spain – 2015 (in progress)**

**Incineration Capacity: 200 kg/hour**

### **Hazardous Waste Incineration system, composed of:**

- Medical waste incineration system, with static kiln for batches of 1tn
- Boiler for the production of 1000 kg/h/v of saturated steam at 4 bar
- Complete gases system treatment (Sodium Bicarbonate and Active Carbon)
- Designed to destroy 200 kg/h of hazardous waste
- The Average Heat Value is 3.000kcal/kg and the unit operates at negative pressure
- Due to the potential variation of composition of the waste, the system was designed to operate in a flexible way based in the feed-back information from the CEM unit. All the “parts” can modulate, from the burners to the injectors or variable drive frequency to the exhaust fan.



## WASTE INCINERATION

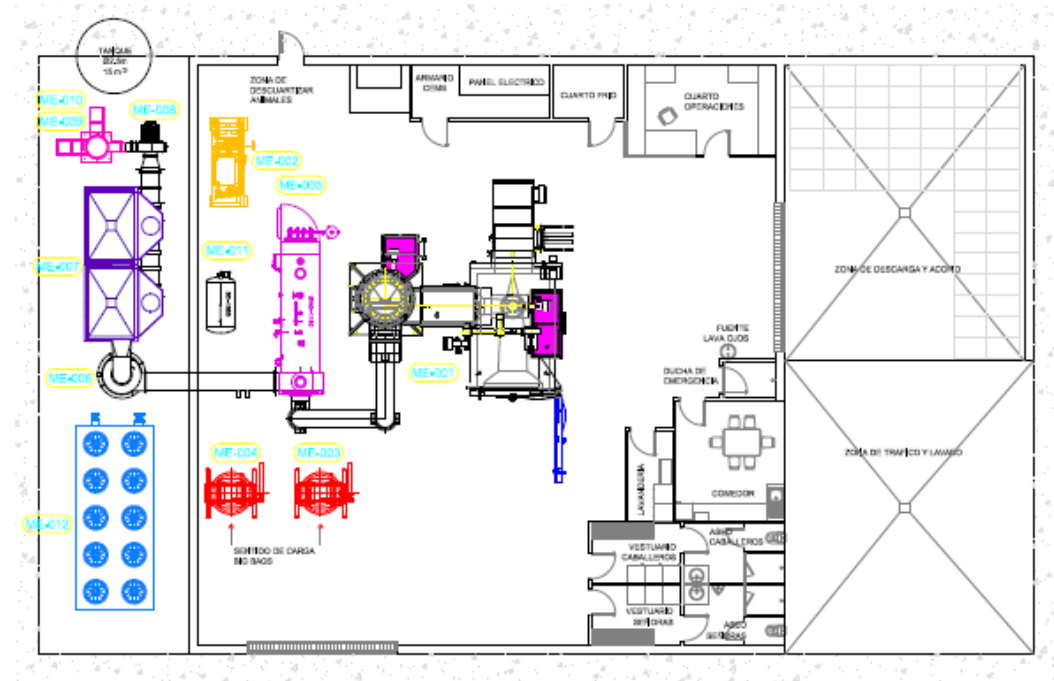


Panama Airport – 2016 (in progress)

**Incineration Capacity: 700 kg/hour**

**Hazardous Waste Incineration system, composed of:**

- Hazardous waste incineration system, with static kiln
- Flue Gas Cooler
- Designed to destroy 700 kg/h of hazardous waste
- The Low Heat Value (LHV) is 1500kcal/kg





# OFFICES & PROJECTS WORLDWIDE



**Our Offices:** Barcelona | Beijing | Moscow | Santiago de Chile

## **Our Projects:**

Argentina | Bulgaria | Czech Republic | Germany | Indonesia | Iran | Kuwait | Portugal | Russia | Spain | Slovenia | Thailand  
Turkey | United Arab Emirates | United Kingdom

## Competitive Advantages:

### ■ Tailor-made Solutions

Environmental technology solutions for all industries, adapting the project 100% to the technical requirements of customers around the Globe.

### ■ Turn-key Projects

Turn-key projects, from the engineering and designing phases to the manufacturing, installation, start-up and maintenance of the equipment. Hence, we can provide the full integrated package.

### ■ Competitive Cost for Customer

Tecam Group technology equipment is offered in a competitive cost for customers, which is an important advantage for companies nowadays.

### ■ Long-term Business Strategy

Maintaining sustainable growth in the environmental technology business, establishing long-term partnership with leading international customers, and expanding our business to emerging markets with growing opportunities for environmental technologies.

### ■ International Offices & Experience

Local offices in Spain, Russia and Chile for a local approach.







# Thank you for your interest

## Contact Details:

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