

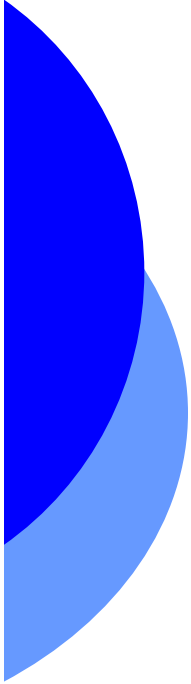


New Generation Mobile Unit for PCBs Contaminated Oil and POPs Destruction with High Temperature

10th Annual Pesticide and AG Plastics
Stewardship Conference
Savannah, Georgia
February 21-23, 2010



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Introduction to FRALMA



FRALMA Technologie Inc.

Was born in Québec, Canada on November 1999, and is dedicated to the development and manufacturing of special equipment for POPs destruction.

FRALMA creates a unique operating equipment to apply high temperature technology method of combustion that effectively destroys PCBs contaminated oils, and pesticides to 99.99999% of destruction



Introduction to FRALMA



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René Cornellier

FRALMA's Founder and President

- Mechanical/chemical engineer
- Holder of many patents rights in robotics and mechanical equipment
- Has developed sophisticated and specialized equipment to handle complex processes for companies like: Northern Telecom, Mitsubishi, Samsung, NASA, US Military Aerospace, Sanyo etc.



Around the World

- Unknown PCBs and pesticides inventory in some countries
- Few treatment or destruction alternatives
- High exportation costs (Transportation regulated by Basel Convention)
- Transportation companies with issues related to movement of toxic materials
- Stockholm Convention deadlines approaching
- Tight environmental regulations



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About FRALMA

- First prototype was built and tested in 2002
- In 2005 FRALMA began final phase of R&D to build new generation equipment for destruction
- FRALMA unit meets international destruction standards, and control of gas emissions in the atmosphere

This equipment destroys PCBs
contaminated oil at any concentration
(including ascarel),
and liquid pesticides

FRALMA's prototype Mobile Unit of Easy Transportation



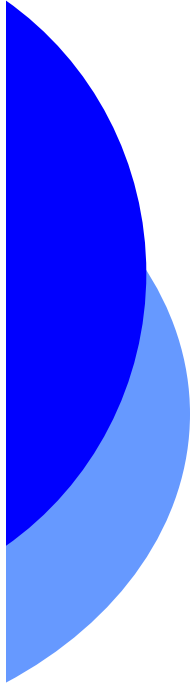
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FRALMA Unit ready to be transported



FRALMA Unit during tests showing sample probes on Chimney

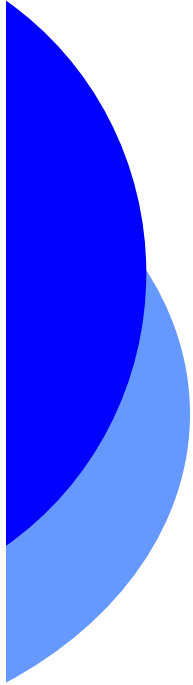


Technology Highlights



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- Capacity 1,200 L a day/ 1 L per min (20 hrs. operation = 1 m ton)
- Destruction in batches for best results achieved with homogenized wastes
- Very little non contaminated residue
- Real-time gas emission analyser
- Safety operation enhanced with alarm system and emergency stop
- Chlorine removal with dry scrubber
- Prevents risks of contamination in air/soil



Main Components



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- Oil contaminated tank with pumping and homogenizing systems
- Combustion chamber
- Destruction chamber
- Exhaust and flue gas cooling tube
- Detachable chimney
- PC controls for gas analyzer and operation
- Continuous gas analyzer system
- Diesel generator



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Process Description

Working in batches of 1,200 l. per day (1 l. per minute) to ensure maximum control of temperature and emissions with continuous registration.

- The contaminated oil tank can be supplied from different sources with different PCBs concentrations or pesticides
- All feed is homogenized into the reservoir before the process starts to assure constant emissions results per batch



PCBs contaminated oil or pesticides tank

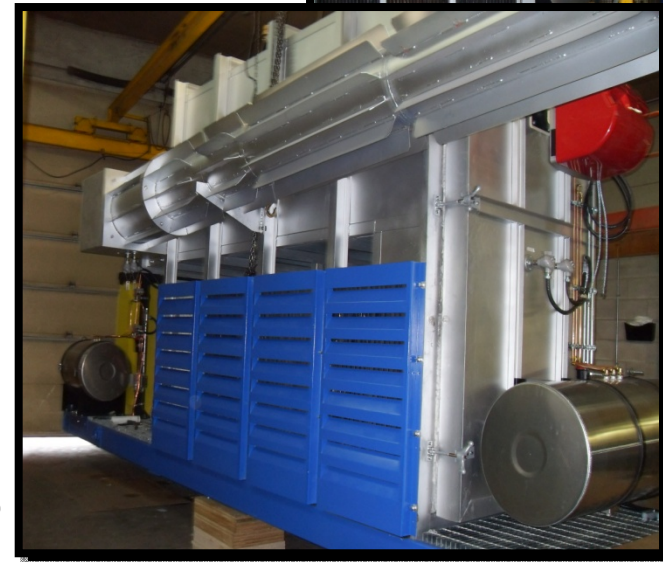


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Process Description

Combustion Chamber:

- Volume 3.5 cu.m.
- Operates at 850 °C with 3% oxygen
- Hybrid burner with contaminated oil being burned at the core of its flame
- Combustion of 99.9%
- Temperature controllers
- Continuous registration



Combustion and Destruction Chambers, and Cooling Tube



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Process Description

Destruction Chamber:

- Volume 4.5 cu.m.
- Destroys gasses produced in Combustion Chamber (furans and dioxins at 1,200 °C)
- Destruction efficiency better than 99.9999%
- Temperature controller with security back up



Combustion Chamber



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Process Description

Cooling Tube and Emissions:



- Gas cools down from 1,200 °C to 500 °C at point of scrubbing gas to prevent re-formation of dioxins and furans
- Zeolite catalysts cartridges filter gas and absorb chlorine before emissions in the atmosphere



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Process Description

Sampling and Control:

- Sampling probes connected to gas analyser by heated line. Real time gas emission analyzer that continuously read and register the following gases before they are emitted to the atmosphere:
 - Carbon Monoxide (CO)
 - Chloric Acid (HCl)
 - Carbon Dioxide (CO₂)
 - Oxygen (O₂)
 - NO_x
 - Sulphur dioxide (SO₂)



PC controls whole unit and gases emissions



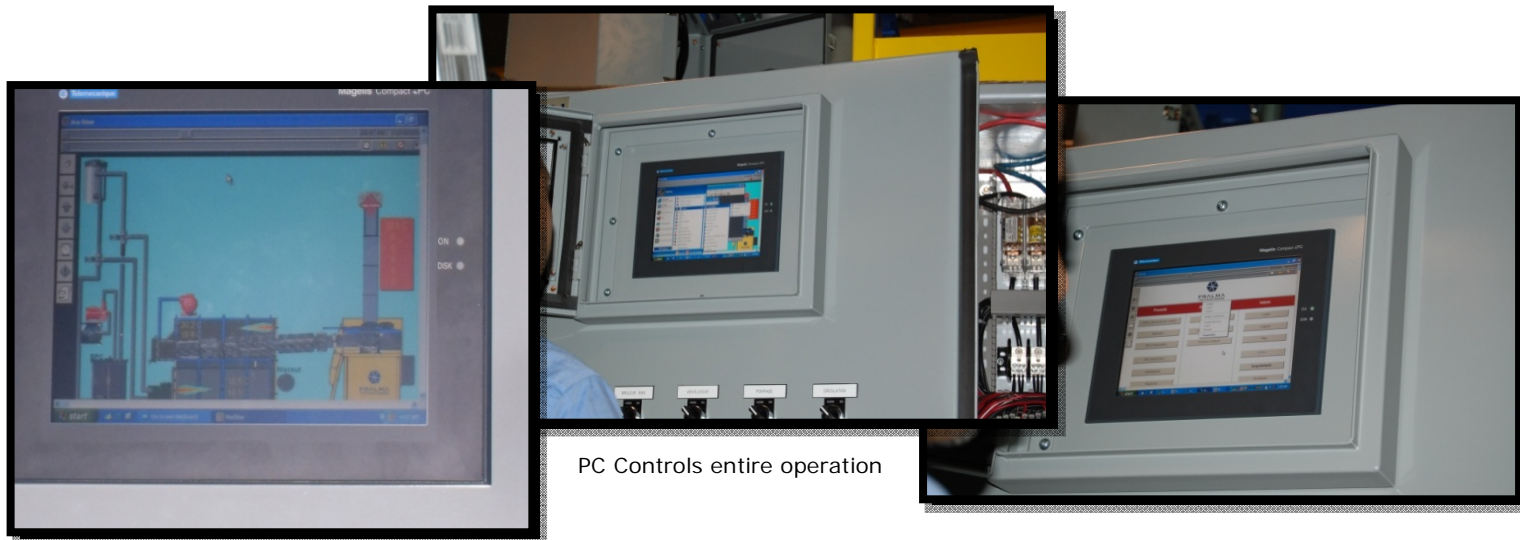
Inside control panel

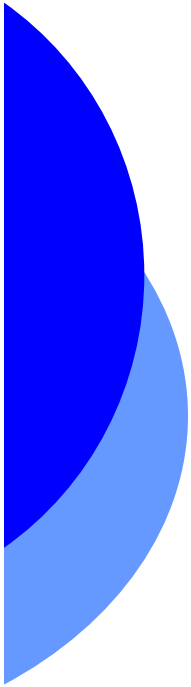


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Control Panel

- Customized program that allows control and management on a continuous basis of entire operation (settings, detection limits, temperatures, oil feeds) for unit's protection, and offers the possibility to create a wide variety of statistics, comparisons and profiles through the parameters established and regular operations.
- Gas monitoring system (FTIR, oxygen sensor) measures and sends gas concentrations, to be recorded and displayed in the touch screen computer.
- PC can be connected to the internet and monitored from Canada.

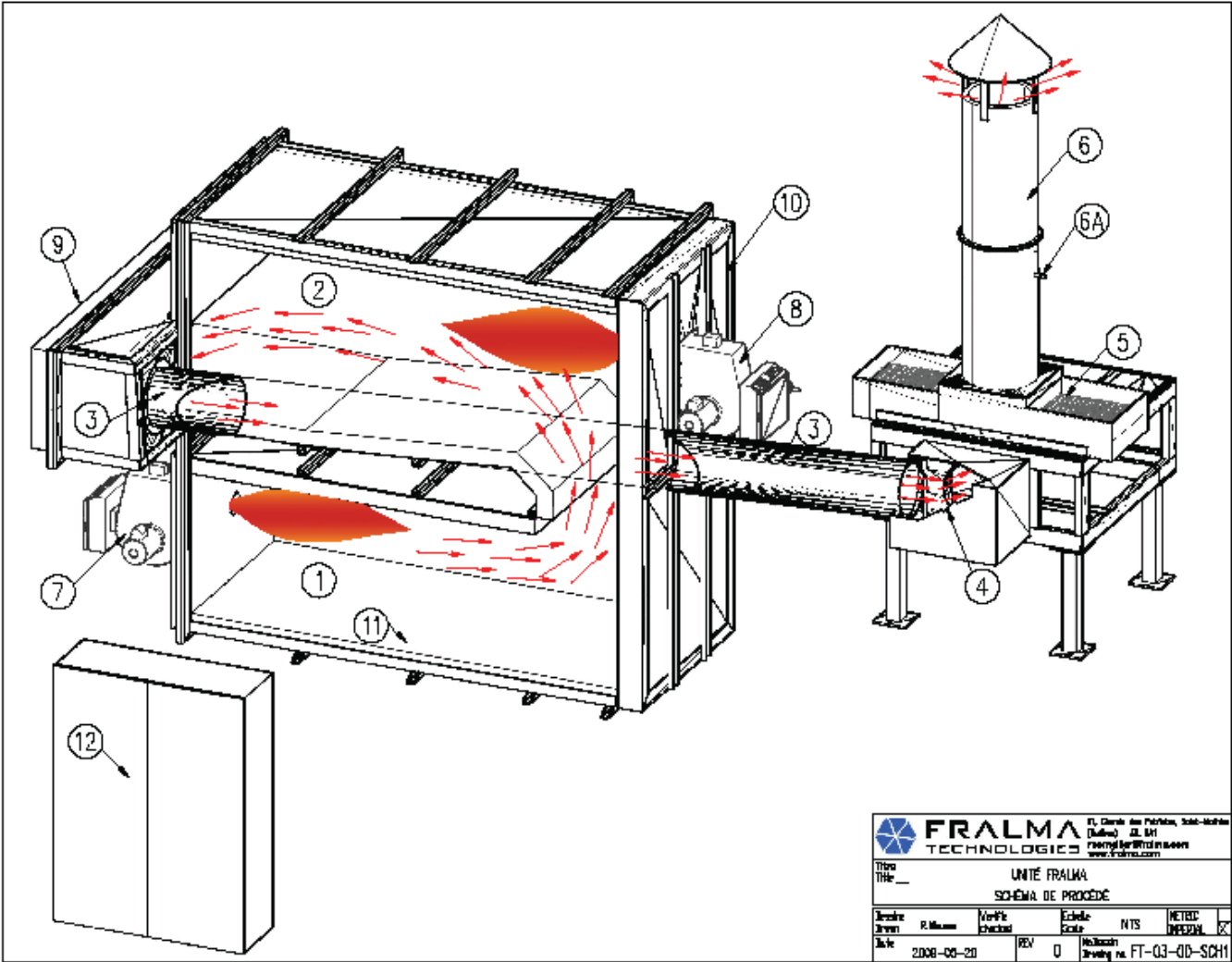




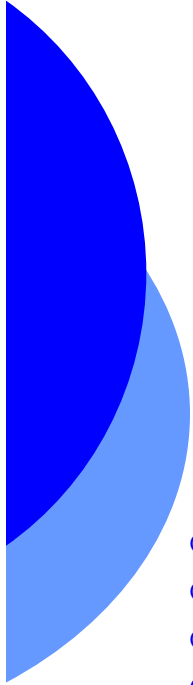
Gas Flowsheet



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		FR, Centre des Pétroles, S.A. - Indes (Lubrizo) - 41, 411		www.fralma.com	
Titre		UNITÉ FRALMA			
Schéma		SCHEMA DE PROCEDE			
Version	P. Moun	Vérifié	Echelle	NTS	METTEL
Date	2008-03-20	REV	0	Modifié	INSEPH
		Dessiné par: FT-03-QD-SCH1			



May 2008 Tests



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Tests Conducted Under Independent Approved Lab with Authorization of Federal and Provincial Governments

Atmospheric Emissions

- PCB < 1mg/kg of PCB supplied
- 2,3,7,8-TCDD Toxic equivalent 0.038ng/Nm³
- HCl 43 ng/Nm³
- Particulate matter 13mg/Nm³

PCB Destruction Process

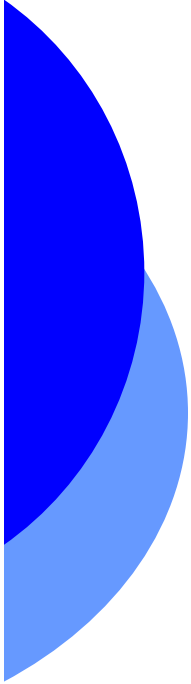
- Destruction efficiency 99.999990%
- Residence time 2 seconds at 1 200°C
- O₂ % 10.3%
- Carbon monoxide 3.2mg/Nm³

Liquid waste or residue

- No liquid residue

Solid residue

- PCB < 0.5 mg/kg
- PCDD/PCDF Technical Toxic Equivalent 0.0017 ng/Nm³



Unit Dimensions



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- For operation:
 - Length 10.36 metres (34 feet)
 - Width 2.29 metres (7.5 feet)
 - High 3 metres (10 feet plus chimney)

- For transportation:
 - Length 10.36 metres (34 feet)
 - Width 2.29 metres (7.5 feet)
 - High 3 metres (10 feet)

- Weight: 18,000 Lbs = 9 ton



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FRALMA Mobile Unit



FRALMA prototype during tests



FRALMA commercial unit during tests

Benefits of Working With FRALMA Unit



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NO MORE TOXIC MATERIALS TRANSPORTATION
avoiding spills risks and contamination

- Designed to destroy very high concentrations of PCBs and POPs
- Can be adapted to handle large or small quantities (economic)
- Easy operation
- Low maintenance costs
- Can be pulled around by a pick up



Miscellaneous Info

- Unit warranties
 - 5 years on manufactured components
 - In commercial or industrial components as per manufacturer
- Power requirements
 - 7.5 Kwh
- Fuel Volumes
 - 120 litres of diesel per ton of oil/destruction
- No reagents nor water required

Cost of Destruction

Base per batch (1 ton per day) today =
US \$0.50 per litre



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THANK YOU VERY MUCH

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