



Biothermica



Leader in air pollution control technologies

Biothermica is a technology company specialized in the development, engineering and construction of turn-key projects for air pollution control. Biothermica offers customized solutions to treat complex emissions coming from different industrial processes.

Since its foundation in 1987, the company has supplied systems and processes for VOCs control, particulate filtration and landfill gas utilization.

Biothermica's expertise in combustion processes has enabled the successful development of the Biotox® a regenerative oxidation process to destroy non conventional emissions such as COC, TRS, PAH (poly-aromatic hydrocarbons) and dioxin and furans emitted by various industries. This technology was awarded the *Canada Award of Excellence, in 1994 and the J. Deane Sensenbaugh Award* from the Air and Waste Management Association in 1999.

Through its R&D program, Biothermica maintains its leading position in the field of air pollution control technologies in Canada and the US.

The Biotox® Regenerative Thermal Oxidizer

***The key solution
to meet environmental
standards of VOC
emission in the
printing industry***

The Biotox® Regenerative Thermal Oxidizer treats the emissions from printing industrial processes with a pollutant destruction efficiency up to 99.9% and a heat recovery ranging from 85% to 95%.

Regenerative oxidation consists in a combustion process combined to an energy (heat) recovery system. The regenerative heat recovery system uses multiple beds of heat-resistant ceramic material to store and release thermal energy. At high temperature and with adequate residence time, VOCs are oxidized to form carbon dioxide and water. A high VOC destruction efficiency is a guarantee that all odors are annihilated.

Since 1989, Biothermica has actively pursued the development of VOC abatement technologies through its air pollution control units installed in Canada. This work has enabled Biothermica to successfully install three Biotox® units in the printing industry.

Advantages of the Biotox® regenerative oxidation process for the printing industry:

- Energy savings through a heat recovery up to 95%
- Destruction efficiency of VOCs exceeding 98%
- Destruction of odor nuisances
- Very limited NOx and CO2 emissions
- Minimum maintenance and operating cost
- System flexibility with variable VOCs concentration

Design

Each Biotox® unit is entirely designed by Biothermica's multidisciplinary team which includes mechanical, chemical and electrical engineers, as well as computer-aided design and control technicians. The Biotox® unit installation plans are prepared using state-of-the-art computational tools such as CFD software and in-house overall heat transfer programs. The plans are then submitted to the client for approval before manufacturing of the unit begins.

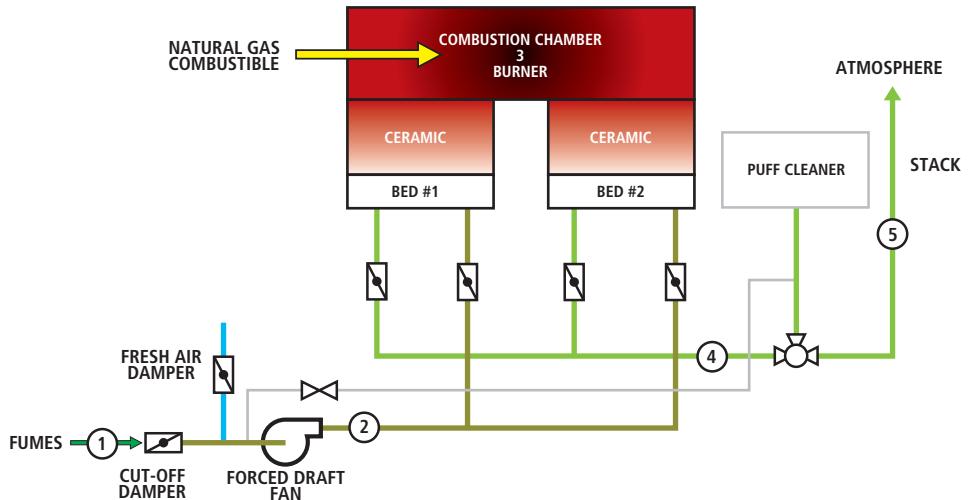
After-Sales Service

Each unit is connected by modem to Biothermica's head office where engineers supervise its operation. A complete after-sales service is offered to the clients.

At all times, Biothermica favors an on-going and systematic relationship with its client to ensure that deadlines are met and that all the interfaces between the Biotox® unit and the plant process are properly integrated.



The Biotox® in the printing industry



Client	ICGQ	Oberthur	Quebecor World
Maximum Inlet gas flow (SCFM)	2 000 scfm	18 600 scfm	20 000 scfm
Pollutant Type	VOC	VOC	COC & VOC
Inlet temperature	300°F	255°F	300°F
Fumes concentration	1 250 mg/Nm ₃	2 245 mg/Nm ₃	1 324 mg/Nm ₃
Chambers	2	2	2
Packing	Ceramic Saddles	Multi-layered media	Multi-layered medias
Fan maximum power	15 HP	100 HP	200 HP
Combustible	Natural gas	Natural gas	Natural gas
Combustible consumption	9.2 m ³ /h	27 m ³ /h	Self sustainable
Overall destruction efficiency	95%	96%	99%
Thermal efficiency	80%	87%	90%
Start-up	March 1996	June 2001	June 2004

Environmental and financial benefits

A typical 20 000 scfm unit will bring to the client the following benefits* :

- Greenhouse gas reduction (CO₂) 2 300 t/yr
- Natural gas consumption savings 500 000 m³/yr
- Payback time less than 2 years

* Compared with a conventional Catalytic Thermal Oxidizer

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Other Units Installed

Year	Location	Industrial application	Capacity (SCFM)
2008	Pointe-Claire, Canada	Painting booth	70 000*
2006	Joliette, Canada	Asphalt shingle manufacturing	35 000
2006	Jonquière, Canada	Brasque treatment	2000
2004	Presque Isle, USA	Food processing	80 000
2004	Magog, Canada	Printing	20 000
2003	Chester, USA	Asphalt coating paper manufacturing	20 000
2002	Napierville, Canada	Petrochemical	3 000
2001	Montreal, Canada	Printing	18 000
2001	Montreal, Canada	Painting booth	200 000*
2000	Farnham, Canada	Flooring product manufacturing	70 000
1999	Montreal, Canada	Textile	9 000
1999	Drummondville, Canada	Painting	32 000
1999	Danville, Canada	Magnesium production	5 000
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1999	Danville, Canada	Magnesium production	5 000
1998	Minneapolis, USA	Asphalt coating paper manufacturing	27 000
1998	Whiting, USA	Asphalt coating paper manufacturing	2 000
1997	Edmonton, Canada	Asphalt shingle manufacturing	23 000
1997	East-Angus, Canada	Kraft pulp and paper	15 000
1997	Deschambault, Canada	Anode manufacturing	6 000
1996	Montreal, Canada	Painting	10 000
1996	Montreal, Canada	Printing	2 000
1995	Montreal, Canada	Asphalt shingle manufacturing	20 000
1993	Montreal, Canada	Asphalt shingle manufacturing	15 000
1990	Joliette, Canada	Asphalt shingle manufacturing	10 000

* including rotary concentrator



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