DIRECT FIRED THERMAL OXIDIZER

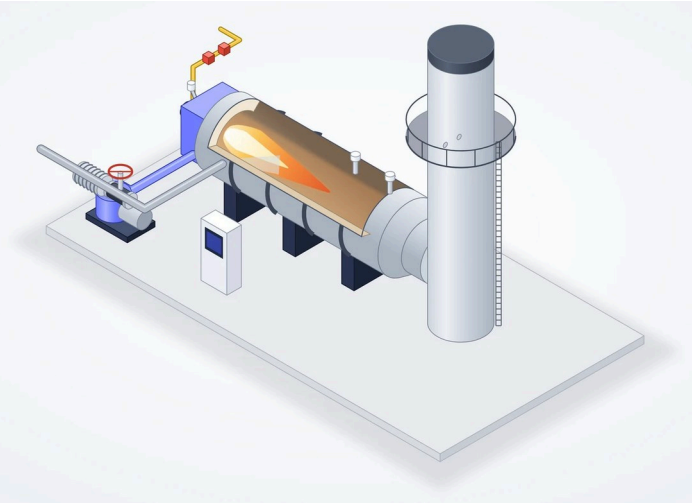
Engineering a Safer World

RAPID, RUGGED, RELIABLE VOC AND HAP DESTRUCTION FOR DEMANDING GAS STREAMS

Waste gas streams carrying volatile organic compounds and hazardous air pollutants cannot be vented to atmosphere without breaching air quality limits. Batch operations, emergency vents, and high-VOC streams add a second constraint: whatever destroys the pollutant load has to respond as fast as the process does, without waiting on a heat exchanger or media bed to catch up.

CRA's Direct Fired Thermal Oxidizer (DFTO) burns waste gas directly in a single combustion chamber, supplemented with fuel and air, at temperatures between 760°C and 1,200°C. Residence time is engineered to hold the gas at temperature long enough to reach the destruction efficiency the application requires before it exits the chamber, with exhaust discharging directly or routing to a downstream heat recovery boiler or scrubber where one is specified. Carrying no heat exchanger or media bed, the design responds immediately to swings in flow and concentration, making it the standard choice for batch operations, emergency vents, and high-VOC streams where speed and simplicity outweigh fuel economy. DFTOs can also be engineered to accept combined streams from multiple process vents, cutting total capital cost and footprint versus installing a separate unit for each vent.

CRA has engineered direct fired thermal oxidizers across biogas, oil and gas, landfill, and petrochemical service for over 30 years, in-house from design through fabrication, under the same ISO 9001 quality system that governs every CRA skid.



CRA ADVANTAGE

+ Exceptional Efficiency (Achieves >99% VOC, HAP, and odour destruction; special units exceed 99.9% DRE)	+ Optimal Design & Performance + Accomodate Special Requirements
+ Handles Tough Waste (Destroys high-VOC, corrosive, halogenated, liquid, and particulate-laden streams)	+ On-Time Delivery + Responsive & Organized Team
+ Reliable Technology (Rugged, low-maintenance design ensures long operational life with minimal downtime)	+ Stringent Quality Management + Fast Turnaround
+ Rapid Response (Fast heat-up and wide turndown make DFTOs ideal for variable loads and batch processes)	+ Cost Effective Maintenance Packages + Long-Term CRA Support

APPLICATIONS

Supplied for VOC, HAP, and odour destruction across biogas, oil and gas, landfill, and petrochemical duty

+ Emergency And Upset Flows
+ Thermal Desorption Off-Gas
+ Landfill And Biogas Streams
+ Printing And Packaging Solvents
+ Automotive And Aerospace Coatings
+ Semiconductor And Electronics Purge Air

CRA
7, Sector 140A
Noida, UP, 201304

Learn more at www.cra.energy

contact@cra.energy
0120 415 6787 · +91 85060 09433

ISO 9001 QUALITY ASSURANCE MANAGEMENT

©Combustion Research Associates

WORKING & PERFORMANCE

Engineering a Safer World

SINGLE-CHAMBER COMBUSTION SIZED FOR SPEED, NOT FUEL ECONOMY

WORKING

+ Waste gas enters a single combustion chamber and burns directly with supplemental fuel and air, with no heat exchanger or media bed in the gas path

+ Combustion occurs at temperatures between 760°C and 1,200°C, sized to the waste stream's heating value and destruction target

+ The chamber holds the gas long enough at temperature to achieve the required destruction efficiency before discharge

+ Exhaust leaves the chamber directly, or routes to a downstream heat recovery boiler or scrubber where one is specified

+ With no thermal mass to precondition, the unit reaches operating temperature and answers flow swings faster than a heat-recovery design

WHY DFTO

+ Destruction Efficiency: >99%, Special Units Exceed 99.9%

+ Operating Temp: 760-1,200°C

+ Waste Streams: Gas, Liquid, Particulate

+ Mount: Skid

+ Lowest Capital Cost Of The Three CRA TO Types

A DFTO is the right choice for high-VOC or high-heating-value streams, batch operations, and fluctuating flows, where fast response matters more than fuel recovery.

TYPICAL DESIGN & PERFORMANCE PARAMETERS

Destruction efficiency	>99% VOC/HAP, special units exceed 99.9%
Operating temperature	760-1,200°C (1,400-2,190°F)
Waste streams handled	Gas, liquid, and particulate-laden
Mount configuration	Skid
Fuel gas consumption	0.5-5 MMBtu/hr (approx. 147-1,465 kW), depending on system size and VOC concentration
Electrical load	10-200 HP blower motor (approx. 7.5-149 kW), flow- and pressure-drop-dependent
Service life	15-25+ years with scheduled refractory replacement
Applicable standard	NFPA 86 classifies direct-fired units as Class A Furnaces, requiring continuous flammability analyzers above 25% LFL inlet loading[L]

Figures per CRA published product data; items marked with a superscript L are drawn from published industry literature.

CRA
7, Sector 140A
Noida, UP, 201304

Learn more at www.cra.energy

contact@cra.energy
0120 415 6787 · +91 85060 09433

ISO 9001 QUALITY ASSURANCE MANAGEMENT

©Combustion Research Associates