RECUPERATIVE THERMAL OXIDIZER

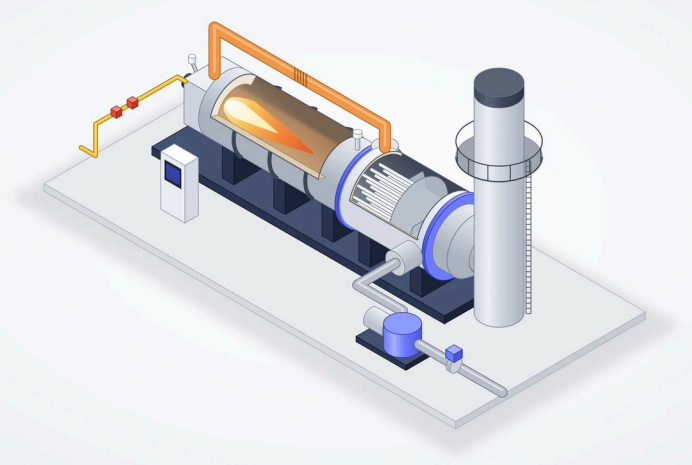
Engineering a Safer World

RECOUPING ENERGY, RECOUPING VALUE WITH OUR RECUPERATIVE THERMAL OXIDIZERS

A direct-fired unit burns through fuel with nothing to show for the exhaust heat, while a regenerative unit recovers that heat but carries the capital cost, footprint, and valve maintenance of a full media-bed system. Continuous, moderate-flow streams need a middle path that captures meaningful fuel savings without that added complexity.

CRA's Recuperative Thermal Oxidizer integrates a shell-and-tube or plate heat exchanger directly into the oxidizer design, using hot combustion exhaust to preheat incoming process gas before it reaches the burner. The preheated gas arrives near the combustion chamber's 760-870°C set point, cutting the auxiliary fuel needed to close the remaining gap. Carrying no ceramic media beds or flow-reversal valves, the design recovers up to 70% of exhaust heat and achieves greater than 99.9% VOC/HAP destruction on a simpler, more compact skid than an RTO of comparable capacity.

CRA has engineered recuperative thermal oxidizers for chemical, petrochemical, and landfill and wastewater duty for over 30 years, in-house from design through fabrication, under the same ISO 9001 quality system that governs every CRA skid.



CRA ADVANTAGE

+ Significant Fuel Savings (Reclaim 40-70% of exhaust energy to reduce auxiliary fuel burn and cut operating costs)	+ Optimal Design & Performance + Accomodate Special Requirements
+ High Destruction Efficiency (Achieves 99% VOC/HAP removal across diverse waste streams)	+ On-Time Delivery + Responsive & Organized Team
+ Lower Thermal Stress (Preheated inlet gas stabilizes combustion temperatures, extending refractory life)	+ Stringent Quality Management + Fast Turnaround
+ Rapid Start-Up And Shut-Down (Heat exchanger cushions temperature swings for faster ramp-up and safe cooldown)	+ Cost Effective Maintenance Packages + Long-Term CRA Support

APPLICATIONS

Supplied for continuous, moderate-flow VOC and HAP destruction across chemical, petrochemical, and landfill/wastewater duty

+ High-VOC High-Heat-Value Streams
+ Low-Volume High-VOC Streams
+ Waste Gas And Fugitive Emissions
+ Acid Gas
+ Liquid Wastes
+ Particulate-Laden Streams

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

CRA
Engineering a Safer World

HEAT EXCHANGER PREHEATS INLET GAS, NO MEDIA BEDS OR REVERSAL VALVES

WORKING

+ Incoming process gas passes through a shell-and-tube or plate heat exchanger, absorbing heat from the outgoing exhaust stream

+ The gas reaches near the combustion chamber's set point before entering the burner zone, cutting the auxiliary fuel load needed to sustain temperature

+ Combustion occurs at 760-870°C in the burner zone, with the preheated inlet reducing the fuel required to hold that temperature

+ The absence of ceramic beds and reversal valves keeps the footprint compact and the maintenance profile close to a DFTO's

RECUPERATIVE AT A GLANCE

+ Heat Recovery: Up To 70%

+ VOC/HAP Destruction: >99.9%

+ Operating Temp: 760-870°C

+ Mount: Skid

+ Sits Between DFTO And RTO On Cost And Recovery

Best fit is steady, continuous flow where an RTO's heat recovery is more than the application needs, but a DFTO's fuel burn is more than the economics justify.

TYPICAL DESIGN & PERFORMANCE PARAMETERS

Heat recovery	Up to 70%
VOC/HAP destruction	>99.9%
Operating temperature	760-870°C (1,400-1,600°F)
Mount configuration	Skid
Heat exchanger type	Shell-and-tube or plate
Fuel savings vs. DFTO	40-70% reduction in auxiliary fuel burn
Comparative positioning	Medium capital cost, compact footprint, best for moderate continuous flows
Critical operating parameters	Inlet gas temperature and fouling rate across the heat exchanger surface govern sustained recovery efficiency[L]
Applicable standard	NFPA 86, burner management[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