ENCLOSED GROUND FLARE

Engineering a Safer World

CONTAINED, LOW-NOISE COMBUSTION FOR RELIEF AND VENT GAS AT PROCESS SITES

Refineries, petrochemical plants, and gas processing facilities often need to flare relief and vent gas close to process units, existing infrastructure, and personnel, where an open flame's visible radiation, noise, and smoke are difficult to permit and site safely. Lean, contaminated, or acid gas streams add further difficulty in holding stable combustion.

CRA's Enclosed Ground Flare burns waste gas inside a refractory-lined chamber at ground level, distributing gas across multiple burners engineered for stable combustion at low pressure drop. The enclosure contains flame visibility, radiation, and noise that an open flare would release directly to the surrounding site, while refractory lining holds combustion temperature above the threshold required for greater than 98% destruction efficiency, keeping the outer shell cool to the touch. Automated controls manage normal operation, upset conditions, and emergency relief without manual intervention, and CFD-simulated design is matched to each site's specific gas composition, including lean, sour, or contaminated streams.

CRA delivered enclosed ground flares under a Lump Sum Turnkey contract across three ONGC installations in Assam to eliminate atmospheric venting from ageing flare infrastructure, and engineered an enclosed flaring system with Schlumberger for Cairn's Barmer field to handle lean, contaminated produced gas in a remote desert operating environment. Systems are designed to API 537, API 521 and EU IED, and built under the ISO 9001 quality system that governs every CRA skid.



CRA ADVANTAGE

+ Ultra-Clean Combustion (advanced tip and staged combustion deliver >98% destruction efficiency, smokeless flames, and reduced greenhouse gases)	+ Optimal Design & Performance + Accomodate Special Requirements
+ Contained Noise And Radiation (enclosed design suppresses flame visibility and noise for sites where an open flame is hard to permit)	+ On-Time Delivery + Responsive & Organized Team
+ Handles Variable Flows (high turndown from routine flaring to full emergency relief)	+ Stringent Quality Management + Fast Turnaround
+ Assured Compliance (meets or exceeds API 537, API 521, EU IED, and other global environmental standards)	+ Cost Effective Maintenance Packages + Long-Term CRA Support

APPLICATIONS

Supplied for enclosed, low-noise combustion of relief and vent gas across oil and gas, petrochemical, and process industries

+ Relief And Vent Gas Streams
+ Fugitive Emissions And Odorous Vents
+ Low-BTU Gas Disposal
+ LNG And Petrochemical Flaring
+ Acid Gas And Sour Gas Flaring
+ Tail Gas

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WORKING & PERFORMANCE

Engineering a Safer World

REFRACTORY-LINED CHAMBER CONTAINS FLAME, NOISE, AND RADIATION AT GRADE

WORKING

+ Waste gas enters the chamber through a control valve and distributes across multiple burners designed for stable combustion at low pressure drop

+ Combustion air enters through controlled inlets at the chamber base, supplying the burners evenly across the chamber

+ Refractory lining holds combustion temperature above the threshold required for greater than 98% destruction efficiency, keeping the outer shell cool to the touch

+ Automated controls manage normal operation, upset conditions, and emergency relief without manual intervention

+ The enclosure contains flame, radiation, and noise that an open flare would release directly to the surrounding site

WHY ENCLOSED FOR PROCESS DUTY

+ Zero Visible Flame

+ Suppressed Noise And Radiation Vs. Open Flaring

+ CFD-Validated For Lean And Contaminated Gas

+ Standards: API 537, API 521, EU IED

An enclosed ground flare functions as a safety and relief system, ready for upset and emergency events rather than running continuously like a thermal oxidizer, which keeps operating cost lower for intermittent process and relief duty.

TYPICAL DESIGN & PERFORMANCE PARAMETERS

Destruction efficiency	>98%
Visible flame	Zero
Design validation	CFD-simulated, site-specific
Applicable standards	API 537, API 521, EU IED
Construction	Multi-burner, refractory-lined enclosure
Regional deployment pattern	Enclosed ground flares are commonly used at refineries, petrochemical plants, and LNG facilities with storage tanks across Asia, alongside open flares[L]

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

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QUALITY ASSURANCE MANAGEMENT ISO 9001

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