

GASCO



INTRODUCTION

Gasco – Combustion, Process and Thermal Engineering



Gasco Pty Ltd has established a reputation as Australia's leading combustion and process engineering company.

Gasco was formed in 1991 and is an independent, 100 per cent Australian owned company. Its board and management is mainly comprised of professional engineers acknowledged for their experience and expertise.

Gasco, with its highly skilled, multicultural staff, professional engineers and its modern manufacturing facility together with on-site installation and commissioning, is able to offer a comprehensive range of equipment and services including engineering, consulting and design, fabrication, installation, commissioning, project management, audit, maintenance and service.

The equipment and systems provided by Gasco include thermal oxidizers, fired heaters, thermal oil heaters, flares, water bath heaters, burners, heat recovery systems, heat exchangers, burner management systems and gas conditioning including: metering skids, pressure control skids and filter coalescers.

Gasco has a wide range of clients across various industries including oil and gas both onshore and offshore, environmental, mining, mineral, chemical processing, refining and petrochemical, food, automotive, waste

water treatment, biogas and power generation.

Gasco clients include Shell, Petronas, Exxon Mobil, BP, Chevron, Conoco Phillips, Toyota, Boeing, Australian Defence Department, ORICA, ICI, Dulux, PPG, BHP Billiton, Bechtel, Fluor

Daniel, Toyo Engineering, KBR, Worley Parsons, Clough, Shedden Udhe, Aker Solutions, Technip, PSN, Foster Wheeler and many others.

Gasco has supplied Fired Heaters and Thermal Oxidizers to Pakistan, Smelter Burners to China and India, Crude Oil & Gas Heaters to Russia, Hot Oil Heaters to Indonesia, South Africa, Tanzania and the Philippines, Convective Condensate Heaters to Thailand, Flares to Vietnam, Gas Skid to Bahrain, and Flare Heat Shield to Malaysia.

Quality Assurance is a key aspect to all our projects. Gasco is certified by DNV to the requirements of ISO 9001:2008.



Front (Left to right): **Alan Hovorka** Engineering Director, **Nicholas Grzegorzyn** Managing Director/CEO, **Ian Matthews** Sales & Marketing Director.
Back: **Ed Strauks** Engineering Director, **John Peruzzo** Director/Chairman,

THERMAL OXIDIZERS

Thermal Oxidizers are a class of pollution control devices that use the combustion process to destroy HCs, volatile organic compounds (VOC) and Hydrogen Sulphide, hence they are sometimes called afterburners, fume incinerators or tail gas incinerators.

Gasco Thermal Oxidizers include:

- Straight Thermal Oxidizers with or without heat recovery
- Recuperative
- Catalytic
- Regenerative (RTO)

Gasco Thermal Oxidizers can handle a wide range of process parameters including variable waste flow rates, calorific values, temperature and oxygen content.

Features of our Thermal Oxidizers are their robust performance, ability to operate at high thermal efficiency and achieve >99.99 per cent destruction efficiency.

Gasco Thermal Oxidizers scope may include turnkey projects, designed to comply with our clients specifications and environmental authority regulations.

We have supplied Thermal Oxidizers to the oil and gas, chemical, automotive, medical, food, minerals and metals industries.

Heat from the exhaust of a Thermal Oxidizer can be recovered in a Waste Heat Recovery Unit, energy can be utilized in the form of heat transfer fluids – oil, water, air and to raise steam.

A Gasco RTO can provide average thermal efficiency of up to 95+% and use about 20 times less fuel than a TO with no heat recovery. In some applications the VOC present in the waste gas stream may enable the Gasco RTO to operate without any supplementary fuel gas (except at start up). Destruction efficiency of up to 99.5+% is achievable. Gasco builds RTOs under licence to Gulf Coast Environmental – USA (GCE).

Top: RTO for LNG, Acid Gas project loaded on ship at BAE Systems Melbourne, Victoria Australia.

Centre: Recuperative Thermal Oxidizer at an Australian LNG plant.

Bottom: Bottom: Thermal Oxidizer and Hot Oil Heat Recovery OMV/Clough Sawan, Pakistan.



FIRED HEATERS

Gasco supplies Fired Heaters to API 560 and ISO 13705 and proprietary Gasco forced draft convective designs.



A typical API 560 Fired Heater would consist of a:

- Radiant Section
- Convective Section
- Stack
- Burners
- Fuel Skid
- Control System

Gasco being both a combustion and heat transfer company is uniquely placed to achieve the best possible outcomes with respect to high thermal efficiencies, low emission, reliable operation and state-of-the-art Burner Management Systems (BMS) to NFPA, IEC and other codes.

Gasco can supply cylindrical or box cabin type direct fired heaters, equipped with low NOx natural draft or forced draft burners.

To increase efficiency, preheating of combustion air can be achieved by adding a variety of air preheater exchangers.

With the demand for ever increasing safety and reliability levels Gasco can design and supply BMS to IEC 61508 Programmable Electronic Safety Systems. We can also provide a basic hard wired system up to SIL 3.

Gasco convective heaters rely on forced convection heating only, are compact and can achieve thermal efficiency of 90per cent using convective heat transfer.



Top: Thermal Fluid and Regenerative Gas Fired Heaters, OMV/Clough – Sawan, Pakistan.

Centre: Origin Energy's Bassgas Fired Heater project, South Gippsland, Victoria, Australia.

Bottom: Stabiliser 9.2MW Reboiler Heater for Woodside Train 5 at Burrup Peninsula, WA Australia.

FLARES

Gasco together with our technology partner has supplied flares to the oil and gas, flares for petrochemicals, flares for terminals, flares for landfill and flares for sewage (biogas) industries.



Flares type

- Utility (Pipe) flares
- Steam Assist flares
- Air Assist flares
- Gas Assist flares
- High Pressure Staged flares
- Enclosed Ground flares
- Pit/Ground flares

Flame support structures

- Self Supporting
- Guyed
- Derrick

Purge seals

- Dynamic
- Molecular
- Non Pulsating Liquid Vessel

Ancillaries

- Knock Out Drums
- Staging control
- Control systems: hazardous and non hazardous area rated
- Snuffing
- Remote Flame
- Radiation Shields
- Seal Drums

Monitoring

- Flame and Detonation Arrestors
- Radiation Shields for Offshore

Platforms

- Consulting

Applications

- Gas treatment plants
- Gas well testing
- LNG plants
- Oil refining
- Landfill gas (LFG)
- Sewage lagoons
- Digester gas
- Coal seam methane (CSM)
- Coal mine drainage
- Metal smelting
- Biofuels

Top: Flare, Mole Seal, Dual Ignition Electronic & Flame Front Generator. Coal Seam Methane, Santos.
Centre: Nickel Smelter Flare for destruction of methane / H₂S.
Bottom: Two x 1,200m³/h Digester Gas Flares, H₂S Odour control – Waste Water Treatment Plant.

WATER BATH HEATERS

Water Bath Heaters are Indirect Fired Type usually designed to API 12K, these devices are traditionally used to heat natural gas and oil.

Water Bath Heaters can also be used for heating:

- High pressure gas
- Crude Oil
- Vaporizing and superheating LPG & LNG
- Regeneration Gas Heating
- Heat Transfer Fluids
- Heat sensitive gas and fluids
- Molten Salt Heaters
- Direct Fired Reboilers
- Amine Reboilers
- TEG Reboilers

The main application for Indirect Fired Water Bath Heaters is to heat high pressure gas prior to pressure reduction, this prevents hydrate formation that can occur because of the temperature drop due to the Joule Thomson effect. The natural gas can also be post heated to suit the operation of gas turbines.

A typical water bath heater consists of an insulated shell, removable process coil, removable fire tube, stack burner, gas train and control system.

Gasco options include:

- Natural Draft Burners
- Forced Draft Burners
- Pneumatic Gas Control
- Electric (Electronic) Control
- Remote Monitoring

Gasco can also supply complete gas conditioning skids consisting of Water Bath Heater, Pressure Reduction, Filter Coalescer and Metering.

Top: 3,500KW Crude Oil Heating – Sakhalin, Russian Federation.

Centre: 6,300KW Gas Turbine Water Bath Heater, NSWs Australia.

Bottom: 2,000KW Gas Turbine Water Bath Heater, South Australia.



HOT OIL HEATERS

Gasco supplies a range of Hot Oil Heaters:
100KW to 15,000KW gas fired, 25KW to
1,500KW electric.



The gas fired heaters consist of two concentric helical coils which has the advantage of:

- Compactness
- High Efficiency
- Low Thermal Mass

The dual helical coil design allows maximized heat transfer, minimises thermal stresses and prevents overheating. The coil design has the advantage that ensures high fluid velocities, low film temperatures and no accumulation of gases.

The burner can be selected to suit the application, type of fuel – gas, oil, heavy oil, timber and turndown. The flame shape is carefully matched to the coil configuration. Typical efficiency with air preheating can range up to 90+ per cent depending on thermal fluid outlet temperature, fuel, and atmospheric conditions.

Each heater has a pre wired control panel that ensures safe and efficient operation of the heater.

As well as supplying heaters, we can provide skid mounted units that incorporate primary and secondary pumps, expansion tanks, stack and drain/fill tanks.

There are a myriad of applications that are suitable for hot oil heating.

- Gas Plant – Regeneration
- Tank Heating – Bitumen, Wax, Emulsions
- Reactor Heating – Chemical Industry, BioTech
- Platen Presses – Timber Industry, Moulding
- Hollow Flight Screws – Mineral Processing
- Pipe Tracing – Heavy Fuel Oil, Bitumen, Wax
- Ovens – Printing, Automotive
- Extruders – Plastic
- Fryers – Food
- Calendar Rolls – Plastic, Film
- Autoclaves – Aerospace, Rubber, Brick
- Dryers – Timber, Food
- Kilns – Timber

Gasco can supply a stand-alone heater or a total engineered package to suit any or all of the above applications. Turnkey bitumen heating is a speciality.



Top: 2,500KW Thermal Oil Heater & Pump Skid – Gas Plant, Victoria, Australia.

Centre: 3,700KW Gas Fired Hot Oil Heater Plant – Indonesia

Bottom: 1,000KW Gas Fired Hot Oil Heater for a Grease Plant – Brisbane, Queensland, Australia.

GAS CONDITIONING AND CONTROL SKIDS

Gasco designs, fabricates, installs, commissions and services an extensive range of Process Skids for Gas Conditioning and Oil Treatment.



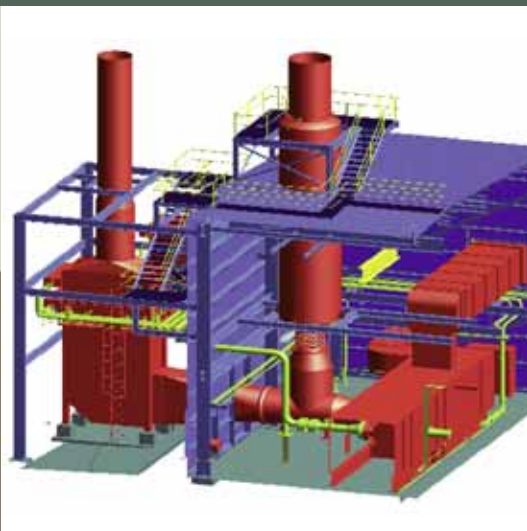
Gasco supplies pressure reduction, metering, separators, filter coalescers, hot oil primary and secondary skids, burner skids and waterbath heaters.

Gasco skids are engineered to meet the client's specifications and International Piping Codes ANSI B 31.3 etc.

Equipment and pipes are sized using inhouse computer programs; pipe layouts are computer pipe stressed. Instrumentation and PLC controls, pre-piped and wired, are supplied as a complete unit saving valuable time and costs on site.

Gasco can supply a variety of Gas / Liquid Separators, Vertical or Horizontal.

WASTE HEAT RECOVERY



Gasco and our associated companies have supplied waste heat recovery systems for:

- Gas Turbines – Thermal Oil, Hot Water, Glycol
- Thermal Oxidizers – Thermal Oil, Glycol
- Air Preheat / Recuperators
- Furnaces
- Heat Recovery Steam Generators (HRSGs)

For gas turbine heat recovery systems Gasco, offers a complete turnkey plant comprising:

- Inlet duct
- Divertor valve
- Divertor stack
- Supplementary burner and controls
- Waste Heat Recovery Unit
- Exhaust Stack

Top: Pressure Reduction and Metering Skid
Bottom: Waste Heat Recovery from Gas Turbine.

SCRUBBERS AND AIR POLLUTION EQUIPMENT

Air pollution treatment systems are required to meet government and environmental codes, remove undesirable process byproducts and recover valuable waste products.



Gasco is an agent for Bionomic Industries Inc, one of the world's most advanced clean air equipment suppliers. Bionomics products range includes Rota Bed® Fluidized Bed Scrubber, Scrubpac™ Custom Packaged Scrubber Systems, Cyclo Plus™ Advanced Cyclones Counter Current Packaged Tower, Direct Contact Packed Heat Exchanger Cross Flow Scrubbers Venturi, Tray, Jet Venturi, Preformed Spray Scrubbers, HEI™ Wet Electrostatic Precipitator Systems, NOx Scrubber Solution.



CONSULTING



Top: Series 5,000 Counter-Current Packed Tower.

Bottom: Low NOx Recirculated Combustion Gas Burner System.

Gasco has supplied consulting and troubleshooting services to a number of major corporations. We have eight qualified combustion engineers on our staff. We have provided assistance to major Oil and Gas companies, EPC Contractors and mineral processing companies.

- Compliance Audits
- Design of Bitumen and Bitumen Emulsion plants
- Thermal Oil (Hot Oil) Heating Systems
- Combustion & Burner Systems
- BMS Upgrades to IEC 61508 PES Systems
- Furnace Design and Efficiency Upgrades
- Oven Upgrades
- Flare System Troubleshooting
- Flare Radiation and Dispersion
- Thermal Oxidizer Applications
- Fired Heater and Waste Heat Recovery
- Upgrades and Commissioning
- Energy Audits

OVENS AND FURNACES

Gasco has supplied numerous custom designed ovens and furnaces for many applications.



Ovens

Gasco has supplied Toyota and Ford with major paint line ovens, air houses and material handling equipment.

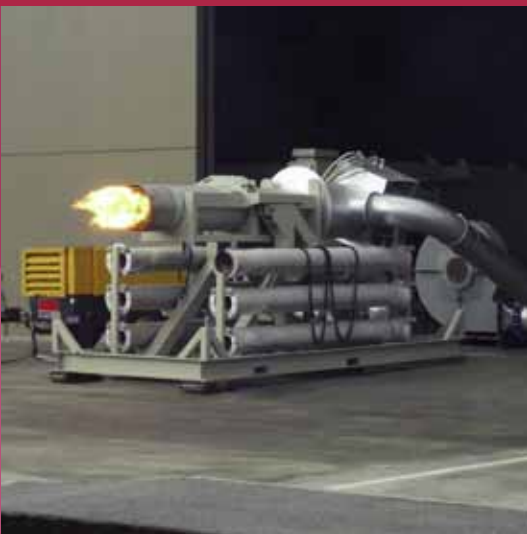
As well as car companies, Gasco has designed, supplied and installed complete paint lines for automotive brake manufacturer, comprising cleaning, powdercoat application, curing and cooling.

Gasco has also supplied bogie hearth and continuous ovens for the glass, fibreglass curing, automotive components and paint and chemical drum heating applications.

Furnaces

Gasco has designed and supplied stress relieving furnaces, salt curing baths, heat treatment, and cremators.

BURNERS AND COMBUSTION



Gasco prides itself as a combustion company on its ability to creatively solve your combustion problems.

Gasco can supply a solution to your combustion requirements. We design and manufacture specialized burners and systems such as 40GJ/h smelter start-up burners. We also incorporate other leading proprietary brands of burners in combustion packages to provide our clients with the most cost effective solution. Specifically, we can offer:

- Combustion System Design
- Burners
- Gas Trains
- Skid Mounting
- Burner Management Systems (BMS)
- Instrumentation and Control Systems
- Hardwired, PLC, PES to IEC 61508
- Safety PLC with SIL analysis
- Scada Systems

Top: Disc Brake Pad Paint Curing Oven – FMP, Ballarat, Victoria, Australia.

Bottom: Purpose built Oil and Gas Burners.

SERVICE



Gasco has eight fully equipped service vans with qualified Type B technicians and an additional eight engineers with Type B qualifications.

Gasco offers 24 hour, 7 days-per-week coverage.

As well as covering Victoria, we can also supply Australia wide as well as international coverage.

We have commissioned and serviced combustion equipment in Papua New Guinea, Indonesia, Phillipines, Pakistan, China, India, Russia, Tanzania and Thailand.

We regularly service a range of combustion equipment not of Gasco's manufacture.

Service maintenance contracts with Gasco provide convenience and peace of mind for many of our clients.

CUSTOM SOLUTIONS — 'SPECIALS'



Top: Members of Gasco's 24 hour Service team.

Below: Electric Hot Oil System.

Over the years, Gasco has tackled many different and unique problems that are not easily categorised.

If you have a combustion or high temperature heat transfer problem or need an upgrade, Gasco has supplied:

- Ladle Pre-Heaters
- Stub Heater for Aluminium Smelters
- Propellant Destruction Furnaces
- Fired Heaters for Simulating Gas Turbine Operating Conditions
- Fired Heaters for R&D in the Mineral Industry

- Robots for Automotive Industry
- Conversion of Carbon Bake Burners from Oil to Gas
- Spray Booths R&D Paint Industry
- Hydrogen Fired Hot Oil Heaters
- Hot Oil Heaters for Casino/Hotel Laundries

This is only a partial list of special products. See *Gasco Products by Industry* listing – back page.

GASCO PRODUCTS BY INDUSTRY

ALUMINIUM Custom designed heaters or dryers for the following: ladles, crucibles, siphon tubes, cathode collector bars, aluminium scrap, moulds, launders, anode stubs, anode blocks. Tar waste melt out and collection. Tar Hot Oil Heaters, Air Heaters, Thermal Oxidisers, Gas Conditioning Skids, Carbon Bake Furnace Conversions.

AUTOMOTIVE Paint and Curing Lines, Spray Booths, Ovens, Core Drying, Air Houses, Heat Recovery, Washing Systems, Thermal Oxidisers, RTOs.

BIOFUELS Flares & RTOs for ethanol and biodeisel.

CHEMICAL Combustion Systems, Air Heaters, Heat Exchangers, Thermal Oxidation, Heat Recovery, Hot Oil Systems, Resin Kettles, RTOs.

ENVIRONMENTAL Afterburners, Incinerators, Thermal Oxidisers, Flares, Scrubbers, Landfill Gas Flares, Odour Incineration, Biogas Flares and Burners, Heat Recovery, Soil Remediation Systems, Liquids Incineration.

FIRE TRAINING AND RESEARCH Thermal Oxidisers for Compartment Fire Behaviour Training & Research Centres.

FOOD Air heaters, Ovens, Burners and Combustion Systems, Thermal Oxidisers, Hot Oil Systems, Heat Exchangers, RTOs.

GENERAL INDUSTRIAL Driers, Ovens, Kilns, Furnaces, Hot Oil Systems, Heaters, Thermal Oxidisers, RTOs.

MINERALS & METALS Air Heaters, Driers, Kilns, Hot Oil Systems, Heaters for Launders, Ladles, Burners and Combustion Systems, Start Up Burners, Flares & Thermal Oxidisers, RTOs.

OIL, GAS Fired Heaters, Thermal Oxidisers, RTOs, Flares, Waste Heat Recovery.

PETROCHEMICAL Hot Oil Heaters, Filter Coalescers, Acid Gas/Tail Gas Incineration, Water Bath Heaters, Crude Oil Preheaters, Condensate Heaters, Pressure Reduction Skids, Heater Treaters, Radiation Shields, Metering Skids.

PHARMACEUTICAL Air Heaters, Driers, Thermal Oxidisers, Flares, Heating and Combustion, Hot Oil Systems, RTOs.

PIPELINE & TERMINAL City Gate Heaters, Gas Conditioning, Water Bath Heaters, Pressure Control Skids, Filter/Coalescers, Metering Skids, Flares, Custody Transfer.

POWER GENERATION Gas Conditioning Skids, Turbine Exhaust WHRU, Water Bath Heaters, Let Down and Filter/Coalescer Skids, Custody Transfer Metering, Heat Recovery Steam Generators (HRSGs).

STEEL Heaters and Driers for Ladles, Tundish, Launders, Vessels, Start Up Burners, Combustion and Control Systems, Thermal Oxidisers, Refurbishment of Furnace Combustion Systems.

The logo for GASCO, featuring the word "GASCO" in a bold, blue, sans-serif font. The letter "A" is stylized with a red triangle pointing upwards, forming the top of the letter.

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