



# 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 are acknowledged for their experience and expertise in the industry.

Gasco, with its highly skilled, multicultural staff and its modern office and manufacturing facility is able to offer a comprehensive range of equipment and services including engineering, design, project management, fabrication, installation, commissioning and service.

The equipment and complete systems provided by Gasco include water bath heaters, thermal oxidizers, fired heaters, thermal oil heaters, flares, heat recovery systems, HRSG boilers, 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, Total, Dolphin Energy, Jemena, Tru Energy, Origin Energy, APA Group, Orica, BHP Billiton, Bechtel, Fluor Daniel, Toyo Engineering,

KBR, Worley Parsons, Clough, Shedden Udhe, Aker Solutions, Technip, Santos, PSN, Oil Search, Power & Water, Melbourne Water, Foster Wheeler, Zadco and many others.

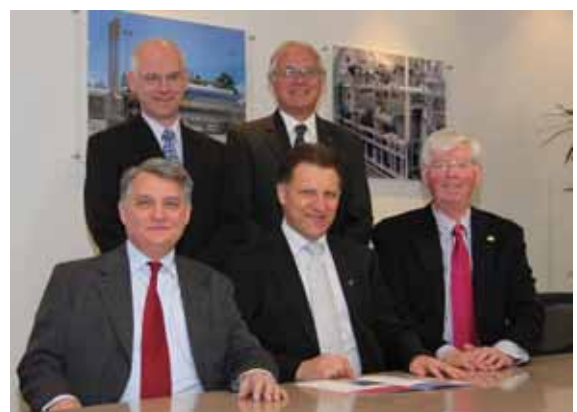
Gasco has supplied Fired Heaters to Pakistan, Turkmenistan and UAE, Smelter

Burners to China and India, Crude Oil & Gas Heaters to Russia, Thermal Oxidizers to Pakistan, Hot Oil Heaters to Indonesia, South Africa, Tanzania and the Philippines, Convective Condensate Heaters to Thailand, Flares to Vietnam, Gas Skids to Bahrain, Burner Management System to UAE and equipment to Malaysia.

Gasco is one of three companies nominated by the Innovation Australian Board for the Innovation Australia Showcase 2011.

Gasco was also presented with the industry Achievement Award 2008 from ICN.

Quality Assurance and Health & Safety are key aspects 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 Grzegorzczyn 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.

**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 90 per cent using convective heat transfer.

## Fired Heater Upgrades for Existing units.

Gasco has upgraded old existing heaters to improve efficiency, safety and emissions using the latest PLC based BMS and NOx reduction technology.



**Top: Forced Convection Regeneration Gas Heater Santos – Australia.**

**Centre: Origin Energy's Bassgas 43MW Fired Heater project, South Gippsland, Victoria, Australia.**

**Bottom: Fired Heaters – Turkmenistan gas plant 18.8MW each.**

# 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, NSW Australia.**

**Bottom: City Gate Victoria - Gas Grid.**

# 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
- Flame and Detonation Arrestors

## Platforms

- Consulting
- Radiation shields for offshore

## 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

## Codes

- To Australian and Regional codes and standards
- Type B Systems

## Monitoring

- Thermocouple
- Remote IR

## Installations

- Commissioning
- Gasco own crew
- Supervision of third parties
- Commissioning is routine

## Service

- By Gasco TypeB technicians
- 24 hour on call service
- Engineering support

Top: Flare, Mole Seal, Dual Ignition Electronic & Flame Front Generator. Coal Seam Methane, Santos.

Centre: Five Coal Seam Methane Enclosed Flares, Anglo Coal.

Bottom: Self supporting Flare for Nickel Smelter.

# 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
- Low weight (ideal for offshore applications)

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: 11,000KW Hot Oil Heater for offshore platform, South East Asia.**

**Bottom: Orica Hot Oil Heating and Cooling package for reactor application.**

# GAS CONDITIONING AND CONTROL SKIDS

**Gasco designs, fabricates, commissions and services an extensive range of Process Skids for Gas Conditioning and Oil Treatment including:**

- Emergency Shut Down Systems
- Filter Coalescers
- Custody Transfer Metering with Analysers
- Hot Water Heater/HX gas heating
- Water Bath Heaters API 12K
- Pressure Reduction Stations
- Black Start Heaters (Electric/steam/hot water)
- Waste heat recovery for gas heating
- Total gas conditioning systems for Power
- Stations a speciality

Gasco designs and builds skid mounted equipment to meet client, Australian and International Standards including: AS1210 AS4140, ASME B31.3, API 12K, etc.

Gasco utilizes 3-D CAD systems to model layouts and enhance layout detail design. Equipment and piping are sized utilizing in-house computer programming and well known proprietary software. Piping and flange loads are computer calculated.

Instrumentation and controls are normally part of scope and skids are prewired and functionally factory acceptance tested (FAT) before leaving our workshop.

Multiple skids may be trial interconnected and tested before disassembly for transport. Additional features may include hot or cold insulation and heat tracing.

Gasco has supplied gas conditioning systems for GE, Rolls Royce, Pratt & Whitney and Siemens gas turbines.

**Top: Metering Skid with Pressure Reduction.**

**Middle: Pressure reduction and associated skids for Gas Fired Power Station in Northern Territory.**

**Bottom: Filter Coalescer, Mortlake Power Station**



# WASTE HEAT RECOVERY

Waste Heat Recovery systems reduce energy costs, provide carbon credits for emission trading systems and help the environment by reducing emissions.

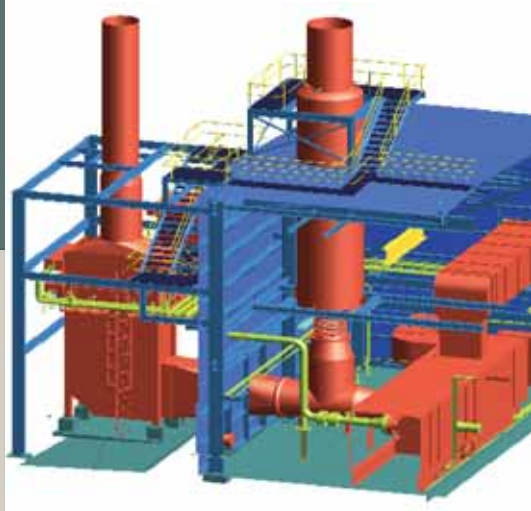


Gasco provides a comprehensive range of Waste Heat Recovery systems for the following:

- Gas Turbines – Thermal Oil, Hot Water, Glycol
- Gas and Diesel Engines
- 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



Gasco can provide for either individual pieces of equipment or supply a complete turnkey operating system for either a new application or modifying an existing plant.

Our range of services includes:

- Survey/Analysis of existing systems
- Engineering
- Hardware
- Hot Oil, Hot Water or Steam distribution systems
- Erection
- Commissioning
- Turnkey Solution
- Heat Recovery Steam Generators HRSGs

Gasco is a licensee of ERK, Berlin, Germany for their world famous Corner Tube Heat Recovery and Steam Generators and Boilers.

To date over 6,000 ERK boilers, HRSGs and high temperature recuperators have been supplied world wide.



Top: Waste Heat Recovery – Tru Energy, Australia.

Centre: Waste Heat Recovery from Gas Turbine.

Bottom: HRSG for Australian food company.

# 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

Above: Low NO<sub>x</sub> Recirculated Combustion Gas Burner System.

# SCRUBBERS AND AIR POLLUTION EQUIPMENT



Above: Rota Bed® Turnkey Scrubber system.

**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, NO<sub>x</sub> Scrubber Solution.



# GASCO

DESIGN  
FABRICATION  
SERVICE



1



2



3



4

1. 3D in house design.
2. Purpose built facility, Melbourne, Australia.
3. 24-hour service.
4. Industry award winners.

# 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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