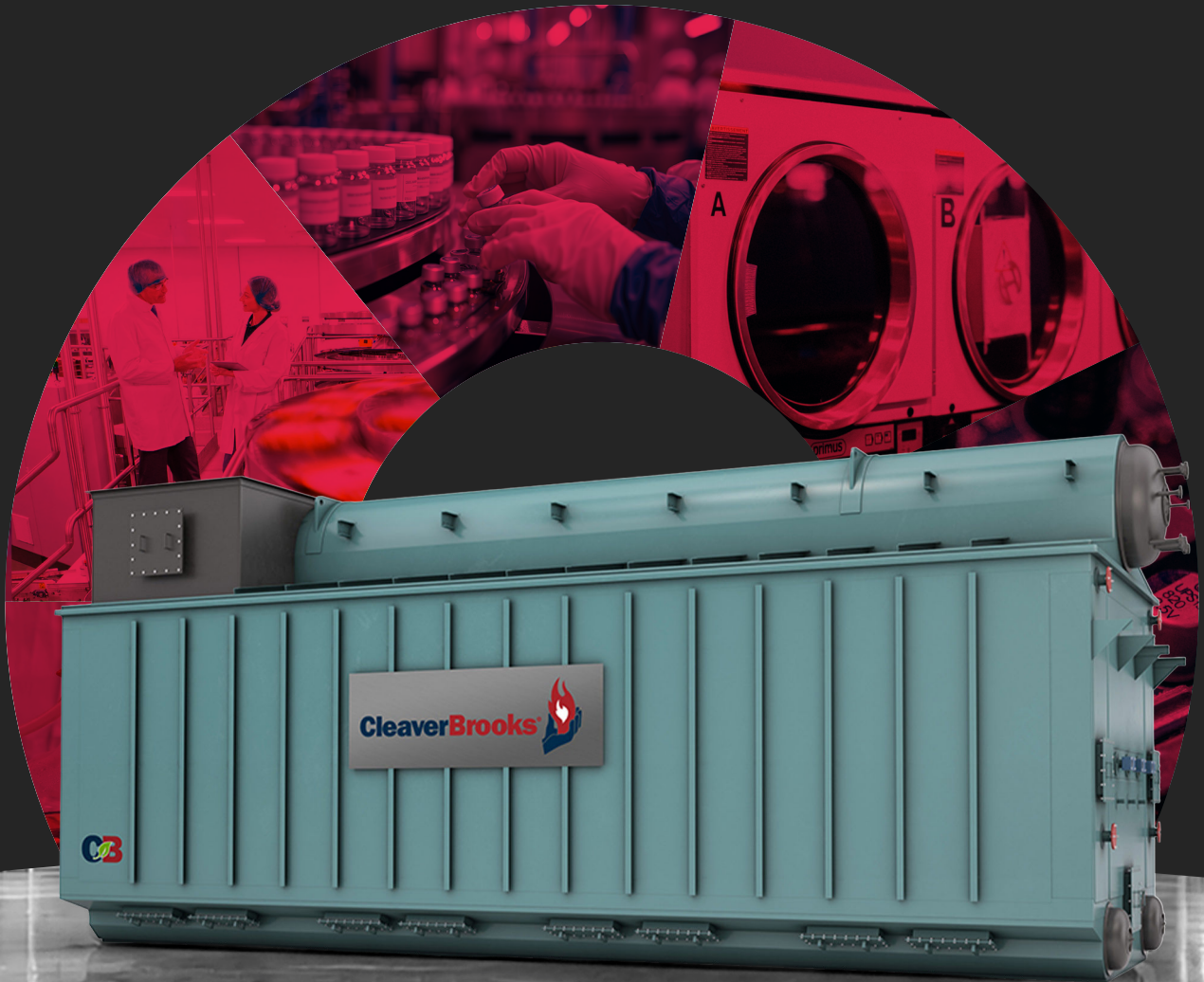




## CleaverBrooks Waste Heat Solutions

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When Sustainability and Efficiency Matter,  
Nothing Goes Up the Stack Unused

**Up to  
226,796 kg/h**

Steam flow across  
the waste heat boiler range

**Up to 95%  
NOx cut**

With SCR and CO catalyst,  
down to 1 ppm

**~372  
tonnes CO2**

Avoided per 293 kW  
of heat recovered

# Decreasing your carbon footprint while increasing plant efficiency.

Waste heat boilers recover process heat to generate steam, or capture heat from solid, liquid or gaseous incinerators, reducing how much fired steam generation a site needs in the first place. Every solution is built around the same four cornerstones: safety, efficiency, reliability and sustainability.

## Supporting your sustainability goals.

- Replace the need for additional auxiliary-fired boilers.
- Avoid around 372 metric tonnes of CO<sub>2</sub> for every 293 kilowatts of heat recovered.
- Cut around 127 kilograms of NO<sub>x</sub> and CO emissions annually.

## Engineered by the experts.

Cleaver-Brooks is a leading provider of energy recovery solutions and a totally integrated, single-source supplier from waste heat inlet through to stack outlet, whether the job calls for a packaged waste heat boiler or a waste heat recovery unit. These systems capture heat that would otherwise be wasted from manufacturing processes and can displace the need for additional steam or power generation entirely. Cleaver-Brooks brings a century of boiler engineering experience to every unit, and O'Brien brings the local design, installation and service that gets it running on an Australian site.

*Waste heat solutions in this range meet the performance and sustainability criteria required for the Cleaver-Brooks Sustainability Seal. Figures reflect manufacturer specification ratings and are confirmed for construction by submittals.*

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## Waste Heat Boilers: Where sustainability meets innovation.

Every waste heat boiler in the range uses the same membrane wall construction, recovering heat from sources like gas turbines, thermal oxidisers or manufacturing processes and turning it into steam. Which configuration fits depends on what's actually in the exhaust stream.

- Single-pass open bottom A- or O-type: suited to dust and ash loading, with bare or combination bare and finned tubes and a low pressure drop.
- Two-pass waste heat boiler with furnace: built for elevated inlet temperatures and dust or ash loading, with bare tubes and partial combustion occurring in the furnace itself.
- Vertical tubes and cross flow series: suited to clean gas applications, with a combination of bare and finned tubes.



|                   | Single-pass open bottom | Two-pass with furnace | Vertical tubes / cross flow |
|-------------------|-------------------------|-----------------------|-----------------------------|
| Steam flow        | 4,536 to 68,039 kg/h    | 4,536 to 136,078 kg/h | 226,796 kg/h                |
| Steam temperature | Up to 482°C             | Up to 482°C           | Up to 482°C                 |
| Steam pressure    | Up to 159 bar           | Up to 159 bar         | Up to 159 bar               |
| Gas flow          | Up to 90,718 kg/h       | Up to 90,718 kg/h     | Up to 453,592 kg/h          |
| Membrane wall     | Yes                     | Yes                   | No                          |

## Waste Heat Recovery Units: Heat recovery for fluid heating.

Where the job is heating a fluid rather than raising steam, a Waste Heat Recovery Unit captures heat from gas turbine exhaust, process furnaces or other sources and applies it to water, glycol mixtures or thermal oil. Vertical, horizontal or combination gas flow arrangements mean the unit conforms to the space available rather than the other way around.

## Fluid heater: Liquid heat for high-pressure applications.



Fluid heaters are engineered around minimal fluid pressure drop, correct outlet conditions and safe fluid film temperatures, with every fluid circuit evaluated for the mass flow, velocity and pressure drop the application actually needs.

- An optimised combination of bare and finned tubes to control film temperatures.
- Inline or staggered tube arrangements, with custom designs available for high gas side pressure applications.
- Heat recovery or supplementary firing up to 927°C.

|          |                                   |
|----------|-----------------------------------|
| Duty     | Up to 58,614 kilowatts            |
| Pressure | Up to 241 bar                     |
| Gas flow | Up to 453,592+ kilograms per hour |



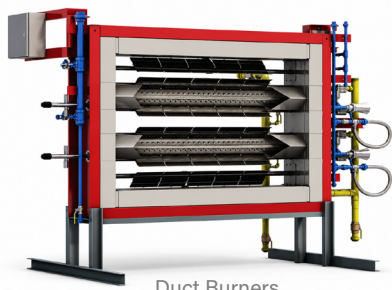
## Max-Flow® Series: High-temperature fluid heating.

The Max-Flow Thermal Fluid Heater and High Temperature Hot Water generator are shop-assembled and built for efficiency, whichever fuel path suits the site. Either can run on a register burner or be designed to recover heat from turbine exhaust with a duct burner supplementing it, all on a forced-circulation design built to last.

- Fluid-cooled membrane wall construction throughout the boiler.
- An optimised flow pattern that controls film temperature and local heat flux rates.
- A combination of bare tubes and varying degrees of finned tubes.
- Vertical or horizontal outlet to fit any space requirement.

|          |                           |
|----------|---------------------------|
| Duty     | 5,861 to 58,614 kilowatts |
| Pressure | Up to 159 bar             |
| Gas flow | Forced circulation        |

## Auxiliary components that round out the system.



Duct Burners

### Duct burners

Natcom® duct burners supplement waste heat recovery with a flame stabiliser system whenever additional steam is needed for heat or process demand, firing natural gas, landfill gas, digester gas, refinery gas, hydrogen or fuel oil. The control system can run the waste heat boiler, duct burner and SCR together, or manage the duct burner as a stand-alone burner management system.



Control Cabinet

### SCR and CO catalyst

Selective catalytic reduction is a post-flue gas treatment that cuts NOx emissions by up to 95 per cent, down to 1 ppm, with computational fluid dynamics modelling predicting flue gas distribution to optimise the design. A CO catalyst converts carbon monoxide and hydrocarbons into carbon dioxide and water vapour, and an integrated control system keeps ammonia slip to a minimum without sacrificing response time.

### Freestanding stacks

Single and double-wall freestanding stacks are available in carbon steel, COR-TEN® or stainless steel, with integral dampers, silencers and bypass stacks added where the application calls for them.

# Why O'Brien?

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- **Australia's Largest**

Leading supplier of industrial boilers across Australia

- **20+ Years Experience**

Decades of engineering expertise in steam & hot water systems

- **24/7 Support**

Around the clock support with instant phone assistance

- **Accredited Training**

RTO Code 45484,  
boiler operation training nationwide

- **Tailored Solutions**

Custom engineered,  
with no off the shelf compromises

- **765+ Active Clients**

Trusted across Australia and internationally

Ready to engineer  
your energy solution?

Connect with us at



1300 771 759



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