ENVIROBURNERS
Advanced Burner Systems for All Customer Requirements
### Wood Dust Burners
- Energy production from wood pellets and sander dust.
- Application for chip driers and power boilers.

**p. 5**

### Start-up and Load Burners
- Reliable start-up and load burners for demanding environment in recovery and fluidized bed boilers.
- Easy installation and start-up

**p. 7**

### Gasification Burners
- Syngas burners produce clean thermal energy from waste and biomass gasification
- Flare incinerators for environmental emission control.

**p. 10**

### Waste gas burners and incinerators
- Clean energy from waste with burner solutions
- Complete emission control with flare incinerators in all process conditions

**p. 12**

### Metallurgical industry burners
- Applications for very demanding processes (temperature, corrosiveness)
- Solutions for roasting furnaces, copper flash melting furnaces, anode furnaces, launder pre-heating, etc.

**p. 15**

### Service and Spare Parts
- Commissioning and maintenance services around the world
- Technical and sales partners in selected markets
Our Story

- Enviroburners was established in 1975
- Over 600 deliveries to all continents
- Supplier for: Alstom, Amec FW, Andritz, Outotec, Valmet
- Our strength is the ability to provide innovative solutions for customers’ needs
The best burner system supplier for the switch from fossil to biofuels.
Increasing environmental and commercial challenges for energy production with conventional fuels has created the need for usage of renewable fuels for burner-applications such as wood dust.

Enviroburners has more than 25 years of experience in supplying wood dust burners for mechanical wood processing- and energy industry. The source of the pulverized fuel can be sander dust from mechanical wood processing or wood dust manufactured from pellets. Also other biomass based pulverized fuels can be used.

Our dust burner provides a compact solution for burning pulverized wood and other biomass with high efficiency that meets the strict emission values. These burners can be operated reliably on both combustion chamber and water-tube boiler-applications.

The burners are supplied with possibility to use auxiliary fuel (gas / oil) for situations when the primary fuel is not available.

Typical wood dust burner system includes: burner, dust conveying system, auxiliary fuel train and burner management system as an option.
**Technical Data**

**Application:** Hot gas generator, steam/water/hot oil boiler

**Burner model:** EBD(L/G) – (MWth)

**Burner capacity:** 1 – 60 MWth

**Operating mode:** modulating

**Control range:** 3:1

**Pulverized fuels:** pulverized wood, anthracite, petroleum coke, biogenic dust from agriculture, etc.

**Heating value (LHV):** 15 – 30 MJ/kg

**Particle size (requirement):** 100 % < 1,0 mm, 90 % < 0,8 mm, 40 % < 0,5 mm

**Auxiliary Fuel:** Natural gas, Propane, Biogas, Heavy/Light Fuel oil

**Combustion air:** Normal fresh/preheated air, 3..5 kPa

**Air/fuel ratio:** 1.1..1.2

**Ignition device:** High energy spark igniter, 4…12 J, natural gas / propane operated igniter, 120 kW

**Emission values: NOx:** 200 – 400 mg/m³
Start-up and Load Burners

Our start-up- and load burners enable quick commissioning and reliable operation for BFB and CFB boilers and gasifiers with more than 40 years of experience. We provide a cost effective solution customized to meet specific end-users’ layout and process requirements.

With over 100 successful projects executed in the past 40 years, our burners are designed for the most demanding environment in fluidized bed and recovery boilers.

The constructions and materials are developed to withstand mechanical and chemical wear and furnace heat for each specific application. This results high availability in less need for service and spare parts in demanding furnace conditions.

Load burners have been developed using CFD modelling to optimize combustion. The burners are equipped with several air registers and steam cooling nozzles to ensure low emissions that meet the most stringent requirements.

Start-up and load burners are designed for all traditional fuel oils and combustible gases. Typical start-up/load burner system includes: burner, auxiliary fuel train. Burner management system is also available as an option.
Technical Data

Application: BFB/CFB boilers and gasifiers, Hot gas generators, 

Fuel: Natural gas / LPG / Light fuel oil / Heavy Fuel oil 

Burner capacity: 1…35 MWth 

Operating mode: Modulated 

Turndown: At least 3:1 

Atomizing medium (fuel oils): Dry pressure air, 600 kPa (g)/Saturated steam 

Combustion air: Normal fresh/Preheated air, 2,5-5 kPa 

Air/fuel ratio: 0,7…1,1 

Cooling air: If the burner is shut down, 10 - 15 % of the combustion air supply should be left on as a source of cooling air for BFB/CFB applications 

Ignition device: High energy spark igniter, 4…12 J / Natural gas / propane operated igniter, 120 kW 

Start-up Burners

Application: BFB/CFB boilers and gasifiers, Hot gas generators, 

Fuel: Natural gas / LPG / Light fuel oil / Heavy Fuel oil 

Burner capacity: 1…35 MWth 

Operating mode: Modulated 

Turndown: At least 3:1 

Atomizing medium (fuel oils): Dry pressure air, 600 kPa (g)/Saturated steam 

Combustion air: Normal fresh/Preheated air, 2,5-5 kPa 

Air/fuel ratio: 0,7…1,1 

Cooling air: If the burner is shut down, 10 - 15 % of the combustion air supply should be left on as a source of cooling air for BFB/CFB applications 

Ignition device: High energy spark igniter, 4…12 J / Natural gas / propane operated igniter, 120 kW
<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Load Burners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application:</td>
<td>BFB/CFB boilers and gasifiers, Hot gas generators,</td>
</tr>
<tr>
<td>Fuel:</td>
<td>Natural gas / LPG / Light fuel oil / Heavy Fuel oil</td>
</tr>
<tr>
<td>Burner capacity:</td>
<td>2…60 MWth</td>
</tr>
<tr>
<td>Operating mode:</td>
<td>Modulated</td>
</tr>
<tr>
<td>Turndown:</td>
<td>At least 4:1</td>
</tr>
<tr>
<td>Atomizing medium (fuel oils):</td>
<td>Dry pressure air, 600 kPa (g)/Saturated steam</td>
</tr>
<tr>
<td>Combustion air:</td>
<td>Normal fresh/Preheated air, 2,5-5 kPa</td>
</tr>
<tr>
<td>Air/fuel ratio:</td>
<td>1,1..1,2</td>
</tr>
<tr>
<td>Cooling air:</td>
<td>If the burner is shut down, 10 - 15 % of the combustion air supply should be left on as a source of cooling air for BFB/CFB applications</td>
</tr>
<tr>
<td>Ignition device:</td>
<td>High energy spark igniter, 4…12 J/ Natural gas / propane operated igniter, 120 kW</td>
</tr>
<tr>
<td>Emission values:</td>
<td>NOx: &lt;100 - 200 mg/Nm³ (O2 3%) depending on application.</td>
</tr>
</tbody>
</table>
Biomass and waste gasification has emerged in the recent years as a replacement for conventional fuel oil and –gas applications. With biomass based gasification gas burners customers can reduce their CO₂ – emissions and convert even the most challenging solid fuels / wastes into clean energy.

Enviroburners has extensive experience of supplying product gas burners for several Finnish and European customers. Our product gas burner provides a compact solution for burning low heat value gases without any additional support fuel with high efficiency and availability.

These burners can be operated reliably on both combustion chambers and water-tube boilers. The burners are supplied with possibility to use auxiliary fuel (gas / oil) for burner start-up and situations when the primary fuel is not available.

Typical gasification gas burner system includes: burner, auxiliary fuel train. Burner management system is also available as an option.

The capacity range is available from 0,3 to 40 MWth.
Technical Data

Application: Hot gas generator, steam/water/hot oil boiler
Burner model: EBD(L/G) – (MWth)
Burner capacity: 0.3 – 40 MWth
Operating mode: modulating
Control range: 3:1
Fuels: Biomass gasification gas, wastew gasification gas, biogas from landfills and wastewater treatment
Heating value (LHV) 3.3…10 MJ/Nm³
Gas Temperature: +20…+700 °C
Gas supply pressure: 1…50 kPa
Auxiliary Fuel: Natural gas, Propane, Biogas, Heavy/Light Fuel oil
Combustion air: Normal fresh/preheated air, 3…5 kPa
Ignition device: High energy spark igniter, 4…12 J / Natural gas / propane operated igniter, 120 kW
Emission values: NOx: <450 mg/Nm³ (O₂ 6%)
Our products for all kind of industrial wastes are custom designed special burners for each application. We have solutions suitable for incineration of all kind of gaseous and liquid wastes in a reliable and environmentally safe manner.

These burners are designed individually, according to each customers’ needs. All relevant conditions at the customer’s facility for the burner equipment are evaluated thoroughly regarding properties of wastes, burner capacity, process issues and emission requirements.

CNCG burners are widely bused in recovery boilers and also in dedicated firetube boilers for incinerating odorous gases and liquid methanol from a pulp mill.

CNCG incinerators (flare oxiders) are used in pulp mills for back-up use to verify non odorous operation in emergency situations in pulp mills. Enviroburners is leading supplier of these equipment.

Petrochemical incinerators (flare oxiders) are used in various types of oil and chemical terminals to verify non odorous and safe operation in loading and unloading of tanks.

Other process burners are used for incineration and power or chemical utilization of process gases, like CO-gases in metallurgical industrial boilers.
<table>
<thead>
<tr>
<th>Technical Data</th>
<th>Waste gas burners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application:</td>
<td>Incineration of odorous harmful gases either in recovery boilers or firetube boilers</td>
</tr>
<tr>
<td>Support Fuel:</td>
<td>Natural gas / Propane / Light fuel oil / Liquid methanol</td>
</tr>
<tr>
<td>Fuel capacity:</td>
<td>up to 25 MW</td>
</tr>
<tr>
<td>Operating mode:</td>
<td>modulating</td>
</tr>
<tr>
<td>Turndown:</td>
<td>at least 6:1</td>
</tr>
<tr>
<td>Atomizing medium (liquids):</td>
<td>Dry compressed air, 600 kPa (g)</td>
</tr>
<tr>
<td>Combustion air:</td>
<td>Ambient fresh air or preheated up to 270 °C, pressure drop 2.5-4.0 kPa, excess air number 1.1…1.3</td>
</tr>
<tr>
<td>Ignition device:</td>
<td>High energy spark igniter, 4…12 J / Natural gas / propane operated igniter, 120 kW:</td>
</tr>
<tr>
<td>Emissions</td>
<td>&gt;99% Oxidation of TRS – components</td>
</tr>
<tr>
<td></td>
<td>NOx: &lt;400 mg/Nm³ (O2 9%) with liquid MeOH</td>
</tr>
<tr>
<td></td>
<td>(In accordance with BREF)</td>
</tr>
</tbody>
</table>
**Technical Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Waste gas flare incinerators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start time:</td>
<td>Fast starting time, &lt;30s, because of no refractories</td>
</tr>
<tr>
<td>Support Fuel:</td>
<td>Natural gas / Propane / Light fuel oil / Liquid methanol</td>
</tr>
<tr>
<td>Fuel capacity:</td>
<td>up to 40 MW</td>
</tr>
<tr>
<td>Operating mode:</td>
<td>modulating</td>
</tr>
<tr>
<td>Turndown:</td>
<td>0…100%</td>
</tr>
<tr>
<td>Atomizing medium (liquids):</td>
<td>Dry compressed air, 600 kPa (g)</td>
</tr>
<tr>
<td>Combustion air:</td>
<td>Ambient fresh air or DNCG, pressure drop 3,5-4,0 kPa</td>
</tr>
<tr>
<td>Ignition device:</td>
<td>High energy spark igniter, 4…12 J</td>
</tr>
<tr>
<td>Natural gas / propane operated igniter:</td>
<td>120 kW:</td>
</tr>
<tr>
<td>Emissions</td>
<td>&gt;99% Oxidation of TRS - components</td>
</tr>
</tbody>
</table>
Enviroburners' products for Metallurgical Industries are custom designed special burners. These burners are designed individually, according to each customer's needs. All relevant conditions at the customer's facility for the burner equipment are evaluated thoroughly regarding fuels, burner capacity and process issues.

Launder and ladle burners are used for the refractory heating of receiving launders and ladles at the anode furnace outlet area. These burners are manually operated natural gas or light fuel oil burners. The construction is made of stainless steel excluding flame cone which material is heat resistant steel. Burner is self-aspirating so ambient air is used as combustion air.

Reaction shaft, Settler roof and Settler wall burners are used as start-up and/or support burners for a flash smelting furnace.Burners are utilizing natural gas or fuel oil with compressed air atomization. The burner construction is normally made of stainless or acid proof steel. Combustion air damper with actuator for air control purposes is included in a burner structure.

Anode furnace burners are used for heating the copper oxidation process and holding proper copper temperature during casting. Burners are utilizing natural gas or fuel oil with compressed air atomization. In the combustion air duct part there is a shaft which enables burner twist along a furnace. Combustion air damper with actuator is included in a burner structure.

Other special burners like hot air generator burners, CO – burners, preheat and start-up burners are also available for different kind of metallurgical processes. If your process needs a burner, Enviroburners will design and supply it.
<table>
<thead>
<tr>
<th><strong>Technical Data</strong></th>
<th><strong>Flash smelting furnace burners</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application:</strong></td>
<td>Flash Smelting Furnace</td>
</tr>
<tr>
<td><strong>Fuel:</strong></td>
<td>Natural gas/ Light fuel oil/ Heavy fuel oil</td>
</tr>
<tr>
<td><strong>Burner capacity:</strong></td>
<td>2…4 MW</td>
</tr>
<tr>
<td><strong>Operating mode:</strong></td>
<td>1-, 2-stage or modulated</td>
</tr>
<tr>
<td><strong>Turndown:</strong></td>
<td>4:1</td>
</tr>
<tr>
<td><strong>Atomizing medium (fuel oils):</strong></td>
<td>Dry pressure air, 600 kPa (g)</td>
</tr>
<tr>
<td><strong>Combustion air:</strong></td>
<td>Normal fresh air, 4…8 kPa</td>
</tr>
<tr>
<td><strong>Air/fuel ratio:</strong></td>
<td>0,9…1,1</td>
</tr>
<tr>
<td><strong>Cooling air:</strong></td>
<td>If the burner is shut down and removable center flange unit is in place, 10 - 15 % of the combustion air supply should be left on as a source of cooling air.</td>
</tr>
<tr>
<td><strong>Ignition device:</strong></td>
<td>High energy spark igniter, 4…12 J/ Natural gas / propane operated igniter, 120 kW</td>
</tr>
</tbody>
</table>
Technical Data

Application: Anode Furnace
Fuel: Natural gas/ Light fuel oil/
Burner capacity: 5…10 MW
Operating mode: Modulated
Turndown: 4:1
Atomizing medium (fuel oils): Dry pressure air, 600 kPa (g)
Combustion air: Normal fresh air, 48 kPa
Oxygen enrichment possible, 0…30%
Air/fuel ratio: 0.9…1.1
Cooling air: If the burner is shut down, 10 - 15 % of the combustion air supply should be left on as a source of cooling air.
Ignition device: High energy spark igniter, 4…12 J/ Natural gas / propane operated igniter, 120 kW

Anode furnace burners
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