

# Melting Oxy-Combustion

## We deliver:

- Up to 40% energy savings
- Up to 90% NOx savings
- Enhanced furnace efficiency



## The Industry Challenge

Environmental issues and rising fuel costs are two substantial obstacles in any growing glass business.

To overcome these challenges and significantly optimize your glass-melting process, discover the ideal solution – **Nexelia™ for Melting Oxy-Combustion**.

## Your Solution

Based on our groundbreaking technology, **Nexelia™ for Melting Oxy-Combustion** uses pure oxygen instead of air, offering optimal glass-melting conditions by improving heat transfer.

Air is commonly used to provide oxygen for combustion to heat industrial furnaces. Oxy-combustion is based on the enrichment of air with pure oxygen to improve the overall energy efficiency of the glass-melting process.

In addition to premium expertise and experience, from oxygen supply to the optimization of the combustion, you'll benefit from equipment and services linked to proprietary new technologies in oxy-fuel glass melting.

**Nexelia™ for Melting Oxy-Combustion** is well suited for all types of glass, including insulation glass, reinforcement fiber, lighting glass and other technical and container glass.

## Your Advantages

### Energy savings

By substituting air by oxygen, you'll save energy while decreasing the volume of flue gas by up to five times, as there's no nitrogen to heat. The energy savings in oxy-combustion furnaces amount to 40% compared to recuperative air-combustion furnaces, and 15% compared to regenerative air-combustion furnace.

### Lower pollutant emissions

**Nexelia™ for Melting Oxy-Combustion** removes the presence of nitrogen in your furnace, thus greatly reducing emissions. In fact, the NOx level is more than 10 times lower than with air combustion.

### Improved glass quality

Combustion with oxygen enhances glass-furnace flexibility. Improving the flexibility and the stability of the furnace operations ultimately improves the quality of the glass you produce.

### Capex reduction

As there's no need to preheat combustion air, you'll be able to reduce capital expenditures with **nexelia for melting oxy-combustion**.

# Core Features

Nexelia™ for Melting Oxy-Combustion consists of:

- **Oxygen supply:**

From liquid storage or in low-pressure gaseous state from on-site production generators.

- **Patented glass-melting technologies**

## Patented burners

- **GLASS MELTING BURNER** is a non-water-cooled oxy-fuel burner specially designed for continuous melting furnaces. And it's appropriate for most glass types.

- **GLASS MELTING BURNER-FC** leverages a patented design in which fuel and oxygen are mixed outside the burner block then introduced in the furnace through a unique configuration of injectors, producing a hugely luminous flame up to three times wider than conventional oxy-fuel burners.

- **GLASS MELTING BURNER-SUN** is based on the principle of significant fuel and oxygen injection separation. It allows you to adjust the flame length and the heat transfer to the furnace yield.

**VALVE TRAINS** is an automated control system to monitor the oxy-fuel burners and their supply systems.

## Modeling services

**AIRLOG** is a 0D mass- and energy-balance calculation tool which verifies that oxy-combustion is viable thanks to first feasibility studies.

**ATHENA 3D** allows a complete description of flows and heat transfer within the combustion chamber and the glass bath in aero-combustion, as well as in oxy-combustion. It helps validate the right choices, especially when converting a glass furnace to oxy-combustion.

## Environmental audits

Air Liquide also provides energy and environmental audits on glass furnaces. This service can include flue-gas analysis of various components, including O<sub>2</sub>, CO, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, air-leakage estimation and flue gas flowrate measurement.

These technologies are easily and reliably performed and installed by our expert teams, who provide you with full support at every step, from the auditing of your current melting process to the preliminary and detailed designs of your new solution, as well as its complete implementation, including commissioning, monitoring and maintenance.

# Case Studies

Case study #1: Technical glass

**Air-regenerative furnace  
200 tpd borosilicate**

- **Customer need:**

- Improve combustion efficiency and cost effectiveness
- Reduce NO<sub>x</sub> emissions

- **Our solution:**

- Conversion to full oxy-combustion furnace

- **Benefits:**

- Fuel savings = 35%
- Yearly operating cost savings = 5%
- NO<sub>x</sub> reduction = 80%

Case study #2: Container glass

**Air-recuperative furnace  
400 tpd soda lime**

- **Our solution:**

- Conversion to full oxy-combustion furnace

- **Benefits:**

- Fuel savings = 33%
- Yearly operating cost savings = 5%
- NO<sub>x</sub> reduction = 75%

# Related Offers

- **Nexelia™ for Melting Oxy-Boosting**
- **Nexelia™ for Melting-Heat Oxy-Combustion**
- **Nexelia™ for Glass Finishing**

## Contact Us

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