FURNACES

- REGENERATIVE
- RECUPERATIVE
- FURNACE CONTROL SYSTEMS
Control systems focused on key-performance factors to grant:
• Minimum Energy Consumption and Operation Cost
• Glass Quality
• Low Polluting Emission
• Furnace Life-Time
• Elaboration of Trend Process

The System allows effective, reliable control and recording of real time or historical data during the whole furnace campaign.

Continuous monitoring and control of parameters such as:
• Pilot Temperatures
• Combustion
• Electric Energy

Flexible application
• Full supply or integration with most best-known PLC brands.
• Integration with glass plant Supervision via SCADA system (Supervisory and Data Acquisition):
  - Forehearth
  - Batch House
  - Forming Area
  - Cold-End
  - Whole Production Process

The application of a SCADA acquisition system creates a multi-terminal network for a fast access to required information and grants a constant overview of:
• Process
• Centralized Controls
• Historical
• Trend
• Correlation between different areas of the plant process.

Access from different places and with hierarchies levels is available to ensure a proper flexibility and safety managing.

**SCADA SOFTWARE:**
- HISTORICAL
- WHOLE CAMPAIGN MEMORY CAPACITY
- ALARM MANAGEMENT (INCLUDED; THROUGH MOBILE AND E-MAIL)

**PLC – DCS ARCHITECTURE:**
- MOST PREFERRED PLC OR DCS BRAND PLATFORM AVAILABLE - REDUNDANCY PLC AVAILABLE
BDF Engineering Dept. develops furnace engineering paying the greatest attention to reach the following targets with the aid of the most advanced 3D-CAD design software:

- Lowest furnace energy consumption
- Highest furnace pull
- Lowest NO\textsubscript{x} emissions
- Best glass quality
- Best furnace operation to assure minimum operating costs at fixed glass quality
- Highest furnace lifetime in terms of metric tons/m\textsuperscript{2}

### Type / Tpd

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- **END-FIRED**
  - REGENERATIVE
  - RECUPERATIVE
Main Features

**Melting Pull**
- From 30 up to 650 tpd

**Melting Area**
- From 20 up to 150 m²

**Application**
- Container, Tableware, Glass Fiber

**Design**
- End-fired, Cross-Fired, Recuperative, Oxy-Fuel

**Fuel**
- Natural Gas, Heavy-Oil, Diesel
Whenever necessary the design is supported by the furnace mathematical modeling.

Mathematical modeling is an important aid to design, for instance, the best electrodes or bubblers configuration and achieve the best furnace efficiency.