glass WORLDWIDE

Auxiliary burner applications in glass manufacture

Discussions about heating applications in the glass industry almost always involve the melter or forehearth, as most of the fuel in the factory is needed to melt and condition the glass. However, in every plant there are many other applications requiring heat, most of which use small amounts of fuel. As safety and control needs become more critical to efficient plant management, looking for improved solutions for these smaller applications has grown in importance. Two applications are discussed here, namely sodium silicate and float applications. David Fontes reports.

Many of the heating needs discussed here have traditionally used a small torch, which was manually lit using no flame safeguards. Control of the gas flow was manually set using just a globe valve and the operator's eye for good combustion. Today, the use of proper flame ignition and monitoring, as well as the use of proper control techniques even on these small applications are needed for safe and reliable operation.

Sodium silicate applications

In one application, heat is applied to a glass stream in the manufacture of sodium silicate in two places. In both locations, the use of a manually lit and controlled burner was replaced with NFPA-compliant control and flame monitoring system, which could easily be designed for EN standards as well.

The main gas train included two control lines, one for each burner with the required safety equipment, including a double block safety valve system. Total natural gas use is low at 600 SCFH (16 Nm^3/h) for one burner and half of that for the second burner. Flame safety becomes more important even though fuel use is low, as this system is used at temperatures below auto ignition.

The controls for one burner, the Selas 1001 NM, include mass flow controls for both gas and blower supplied combustion air. The second burner is an atmospheric burner using self-induced air via its included mixer. Gas for this burner is manually set using a manual flow meter.

For both burners, a compliant flame ignition system is used. To start the burner, the operator pushes the start button for the blower then the burner on button for the Selas 1001 NM burner to initiate the flame ignition process. The gas safety system then opens and the flame is lit via spark ignition and the flame is

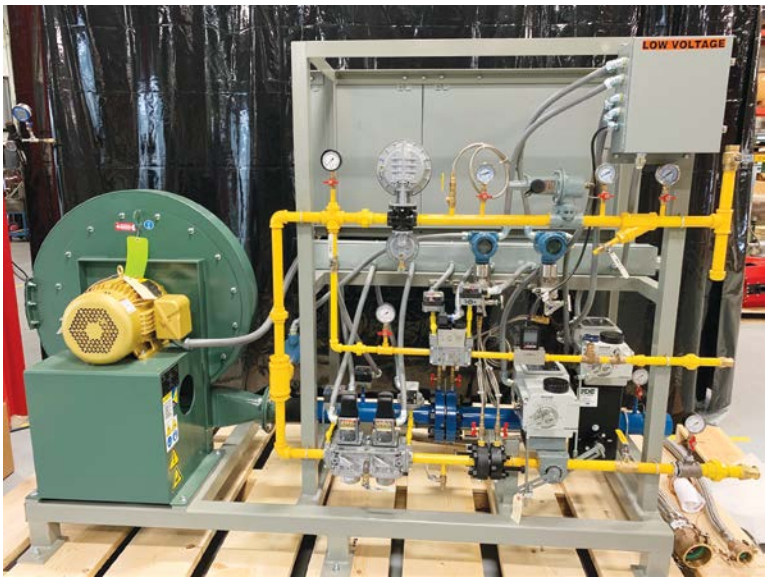

Figure 1: Completed air and gas control system for the 1001 NM burner arrangement.

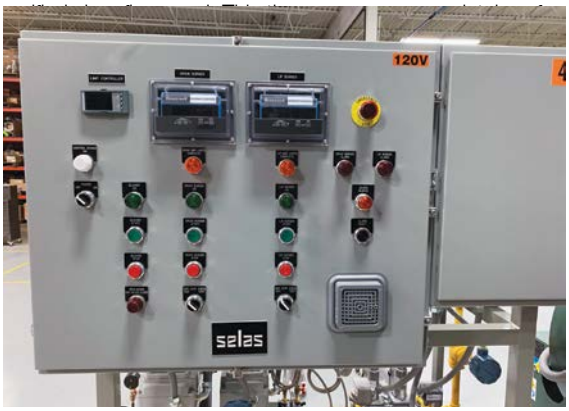

Figure 2: Control panel for the 1001 NM burner arrangement.

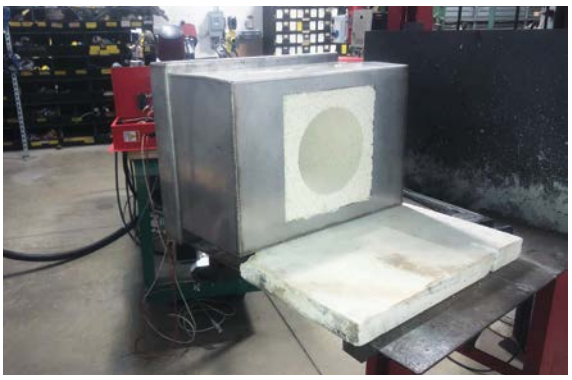

Figure 3: Typical Selas Ensign Utility Burner setyp.

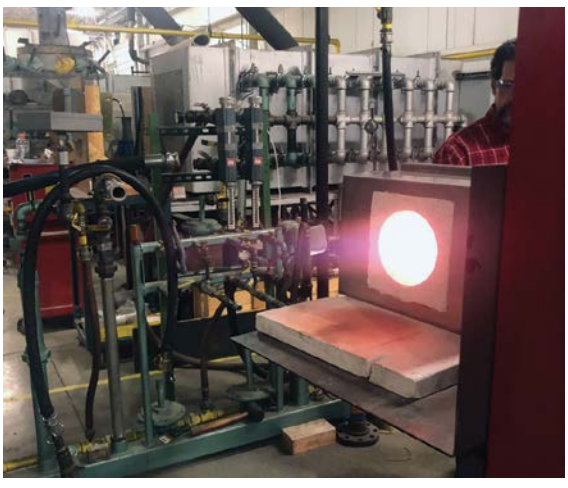

Figure 4: The Selas Ensign Utility Burner provides a ribbon or line of heat.

In many cases, past and present, where extra heat is needed at the edge of the glass ribbon, many different simple torches have been used. The Selas Ensign Utility Burner provides a ribbon or line of heat. The burner length can be from 50mm to over 750mm long with energy output of 25,000-45,000 BTU/in (7.3-25 kW/25mm) of burner length. A typical setup for the burner is shown in figures 3 and 4. This can then be set over the glass to fire and provide the heat needed to either side of the glass ribbon.

An additional application for float is a premix burner for the tin bath. This burner system is used during lip changes for holding heat and to promote a quick change, while preventing the tin bath from cooling down. Some may be concerned with firing directly into the tin bath but with the accurate control of the premix, there is no excess oxygen to oxidise the tin.

The burner system uses the Selas Redi-Pak control unit (figure 5) for control and ignition of the premix. The total volume of air and gas premix is controlled via a 4-20 mA loop through a variable speed blower, which is added to the Redi-Pak control system. The burner rated at 800,000 BTU (230 kW) includes a Selas supplied ceramic nozzle, so there is no concern with nickel. The burner block is housed in a metal frame, so the burners can be easily placed in the tin bath when the side seal is removed.

Compared to furnace controls, these systems may seem quite basic but the fact is that around many glass furnaces, there are many applications that require heat that have not seen the attention to control or safety in the past. With a proper evaluation of process needs and requirements, a safe and reliable combustion system can be designed for any application. Selas has a wide array of premix and nozzle mix burners available for low temperature and low heat applications. With the proper controls, these burners will provide safe and reliable control. ●

Figure 5: Selas Redi-Pak control unit.

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