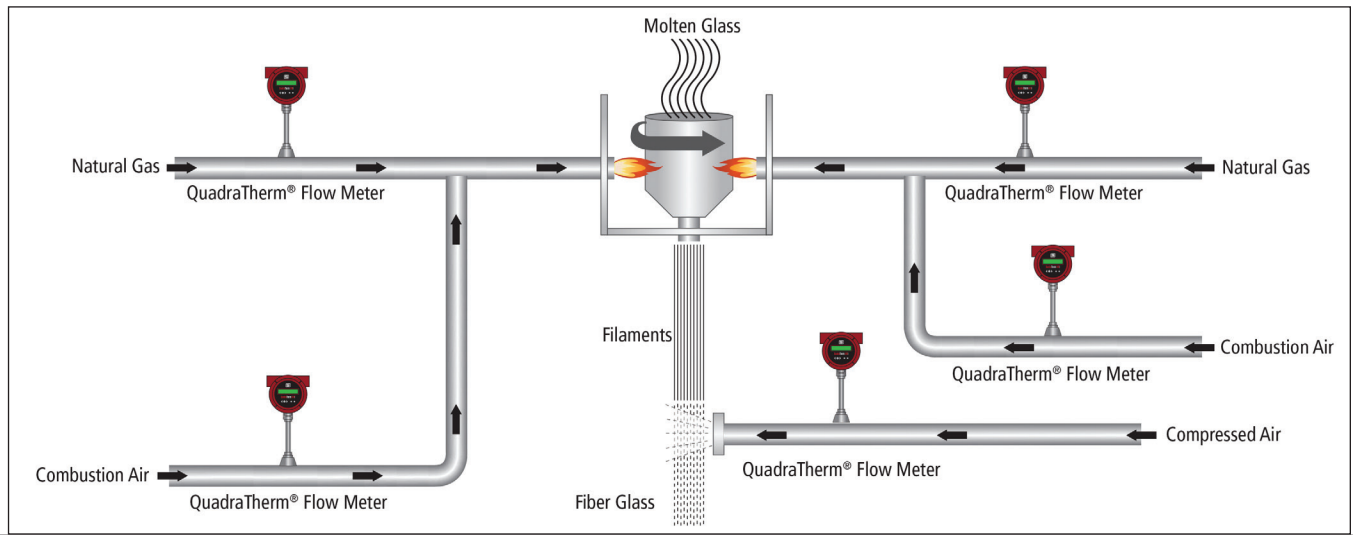




## Thermal Mass Flowmeters Fill the Bill in Precision Gas-Ratio Control Application



### QuadraTherm 640i/780i Series Thermal Mass Flowmeters | Sierra Instruments

Fiberglass insulation manufacturing is almost akin to making cotton candy. A mixture of silica and other components are melted and passed through a spinning extruder, then rapidly cooled with compressed air (see Figure). As older fiberglass manufacturing plants have demonstrated, manual control of air and natural gas flow to the burners used to melt the initial mix often results in unacceptable levels of rejected material, as well as excessive gas consumption.

Process engineers at a fiberglass manufacturing company in the Southwest of the U.S. were seeking methods to improve fiberglass quality, reduce raw material waste, and increase production capacity, all while keeping the measurement and control system as simple and economical as possible. They faced some unique application challenges:

1. The process used existing piping of various diameters to carry the natural gas, combustion air used to melt the glass, and compressed air used to cool and chop the fiberglass fibers.

2. The application also varied with the grade of fiberglass insulation being produced, so the manufacturing process required a great deal of flexibility on gas flowrate, temperature, and pressure. In combustion temperature control, the temperature is directly dependent on the ratio of natural gas to air.

Ultimately, the facilities managers determined that improving the combustion efficiency was the best way to attain the quality and production benefits they were seeking, and they turned to Sierra for a simple and economical solution.

The most efficient solution was a single flowmeter that provides accurate flow measurements of multiple gases un-

der all application variables. Traditionally, orifice plates have been used in combustion-control applications, but they are a fixed size for a certain pipe and must be temperature and pressure compensated. To manage the varying conditions in this application, Sierra's QuadraTherm 780i was deemed to be a perfect fit.

This new four-sensor QuadraTherm mass flowmeter yields unprecedented accuracy for thermal meters— $\pm 0.5$  percent of reading—far better than the 5.0 percent full scale of other technologies. The technology also offers a powerful microprocessor that runs a comprehensive flow-measurement algorithm. This algorithm uses inputs from four temperature sensors, instead of the traditional two.

Facilities managers at the fiberglass manufacturing facility installed the QuadraTherm 780i to provide precise flow measurement. QuadraTherm is able to accurately measure multiple gases with Dial-a-Gas (natural gas, air, compressed air), while measuring high or low flow in various-sized pipes with differing amounts of straight run. Its unique Dial-A-Pipe feature allows the ability to change pipe sizes and types in the field.

The QuadraTherm 780i performed very well in this application, measuring direct mass flow of all gases in the process over a wide range of temperatures and pressures. With this precise mass flow measurement for ratio control, facilities managers reported a higher yield of quality fiberglass, which leads to higher overall production capacity and efficiency.

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