



5. PROCESS CONTROL

by Maria Lang, Glafo

PRESSURE BALANCE

Pressure is in balance when the pressure of the gases in the furnace is the same as the atmospheric pressure outside the furnace. When there is positive pressure in the furnace the hot gases are forced out of the furnace. When there is negative pressure, air is sucked into the furnace from outside.



PHOTO: JAN FRANSSON, GLAFO

Figure 5.1 Measuring the temperature of the glass with a thermocouple in the form of an immersion pyrometer.

INTRODUCTION

Manufacturing processes need to be controlled and directed. In order to ensure good quality glass when manufacturing extended series of items, the conditions in which the glass is made need to be as stable as possible. This can, for example, take the form of maintaining exactly the same level of glass in a tank. In a pot furnace it is important to maintain the right *pressure balance* so that heat is not lost and to ensure that the people working with the glass do not burn their hands while gathering glass.

Another control aspect is more a matter of storage-control than of manufacturing processes. It is, for example, important to manufacture the right number of items or to make the products in the right order in order to be able to meet demand.

One of the fundamental elements needing to be controlled in glass manufacturing is temperature. This is enormously important in processes such as melting, annealing, reheating, firing and tempering pots. Accordingly, this chapter focuses on measuring and controlling temperature – *Figure 5.1*. The thermocouple, which is a commonly used instrument in the glass industry for measuring temperature, is discussed in detail below – *Figure 5.2*.