



HIGH-TEMPERATURE FURNACE CAMERA SYSTEMS

FLOAT TIN BATH

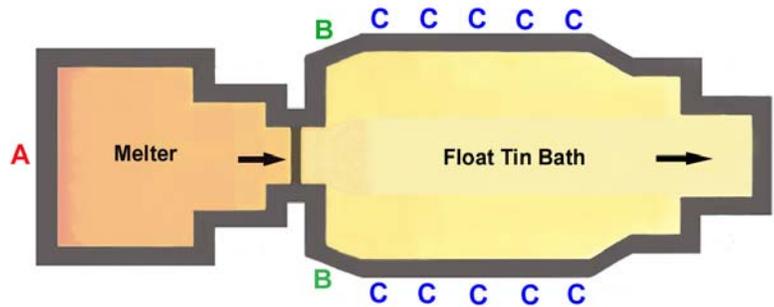
Application Highlights

In the Float Tin Bath Furnace, molten glass from the melting furnace is poured onto the surface of an enclosed bath of molten tin in a controlled atmosphere.

In the melter, batch is heated by natural gas burners to approximately 3000°F (1650°C). The molten glass then flows into the working end where it is allowed to cool to about 2000°F (1094°C) to reach its correct viscosity before entry into the float tin bath. One **Lenox Furnace Camera** (see **A**) is used to observe burner flame geometry, batch pile and formation patterns, melting point, bubbler operation and refractory wear.

From the melting furnace, the glass pours through the canal area and flows atop a bath of molten tin, on which it "floats". The float tin bath is a sealed unit with a controlled atmosphere of nitrogen and hydrogen and is approximately 26 ft. (8 m) wide and 196 ft. (60 m) long. It contains about 200 tons of pure molten tin at an average temperature of 1475°F (800°C).

As a thin layer of floating glass forms (called a ribbon) and spreads in the entrance of the float tin bath, a series of adjustable top knurl wheels



Typical placement of Lenox cameras in a Float Tin Bath Furnace

(automated drive system) on either side manipulates it. Two **Lenox Furnace Cameras** (see **B**) are used to monitor the floating glass formation and spread. Heating elements hang above and are used to control the glass temperature.

The top knurl wheels' speed and angle controls the proper glass width and thickness. Depending on the number of top knurl wheels, up to 16 **Lenox Tin Bath Periscope Systems** (see **C**) can be used to monitor and record the amount of trim being produced, wheel depth and tracking, and the functioning of the automated drive system (top knurl wheels) - helping to reduce scrap by insuring ribbon integrity and improving overall process efficiency.

The formed glass then exits and enters the annealing lehr for cooling and further processing.

Why Use **Lenox** Furnace Camera Systems?

- Designed to be rugged and durable for the brutal atmosphere of the Glass industry.
- Proven reliable dual cooling system and the highest camera resolution with superior optics.
- Minimal maintenance and operating cost once correctly installed.
- Backed by an industry leading **two year warranty**.
- Flexibility in choice of penetration lengths, viewing angles, water or low consumption air-cooling and a selection of portable water-cooled or air-cooled models.
- Lenox know how, expertise and installation/field service.



LENOX FURNACE CAMERA SYSTEM SELECTION GUIDE

**The 1 and only
FURNACE CAMERA SYSTEM
DESIGNED FOR THE GLASS INDUSTRY**

with extreme durability, higher resolution, a time-tested cooling system, a longer warranty, and a much lower average cost to operate.



Model 6935SC Series

Lenox high-temperature, video furnace camera systems are designed to be mounted either directly through the wall or flush with the exterior wall of a furnace. The 3.5 " (89mm) diameter stainless steel camera housing employs a steel triple wall laminar flow for efficient water-cooling of the color CCD camera and PH lens technology to provide clear, real time high-resolution (540 line) images , enabling operation in hostile environments up to 4250°F (2345°C). An integral air-purge prevents fouling of the lens system. The furnace camera is available in lengths of 24" (610mm), 31" (787mm), and 36" (915mm) and provides direct viewing with a choice of 30°, 45°, 90° field of view and zoom capabilities up to 5X.

The *Lenox Tin Bath Periscope System* is a durable and rugged, high-temperature, remote viewing video camera system designed specifically for the float glass process to provide real time, high-resolution images in the tin bath environment. The float glass periscope is a right angle viewing optical/video system that extends into the tin bath to acquire the optimal perspective of the automated drive system (top knurl wheels). The system consists of a high-resolution (570 line), black & white, CCD camera housed in a rugged protective enclosure which provides an interface to the high flow water shroud with mounting flange and nitrogen purge. The *Tin Bath Periscope System* is available in lengths of 96 inches (243cm) and 126 inches (320cm). A manually operated monorail insertion / retraction assembly for mounting to the tin bath is available as an option.



Model 6515F-80XX Series

Please contact us for more information about our products and capabilities and to discuss your specific application.

