

# Temperature sensing solutions

LumaSense Temperature sensing solutions process temperature measurement in the glass manufacturing process. Manfred Hayk reports.

Temperature is an important control factor to characterise and control processes in the manufacture of different glass products. With nearly 60 years of experience, LumaSense Technologies provides an extensive range of pyrometers, thermal imaging cameras and systems for reliable use in the harsh industrial environment of the glass industry, from the temperature sensor to turnkey measurement systems.

Since glass is partially transparent in different ways, choosing specific spectral ranges for different measuring tasks and materials are essential for accurate temperature measurement. Infrared temperature measurement technology provides a decisive advantage to operate without contact, which enables measurement in many different manufacturing processes. Stationary and portable pyrometers from LumaSense detect the temperature at a certain spot, eg on the crown of a glass tank, the temperature of a glass gob during the manufacture of

a glass container or the surface temperature in flat glass production.

LumaSense thermography cameras and thermal imaging systems enable precise temperature measurement images, in which the temperature distribution is displayed by so-called false colours in a thermogram. In this process, the exact temperature at each single pixel is collected and displayed by the thermal imaging camera.

transparency of the glass. Moreover, counting of the gobbs is provided.

## CONTAINER FORMING

The shapes and temperature of glass are important measures to control process quality during glass container production. LumaSense pyrometers and thermography systems enable accurate temperature measurement of glass shapes, as well as the glass containers during the forming process.

## GLASS WOOL SPECIALISATION

During the glass wool manufacturing process, the initial material temperature is crucial for subsequent process steps such as shredding. LumaSense pyrometers (portable or stationary) allow for continuous temperature measurement during different process stages. The company's thermal imaging cameras then detect hot spots in the subsequent processing of glass wool fibres into insulation boards.

## FLAT GLASS TEMPERATURE MEASUREMENT

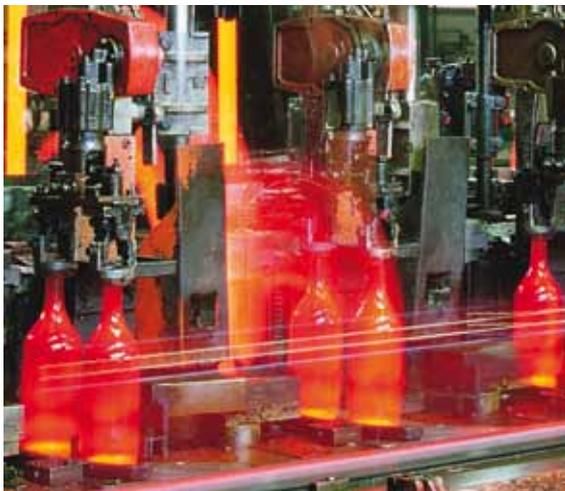
For architectural flat glass, thin materials for the solar industry and flat panel monitors or touch screens, manufacturing process temperatures are recorded and monitored online. LumaSense thermal imaging cameras and pyrometers are designed for integration into various applications and processes. Thus, a precise temperature measurement is possible, even for the thinnest flat glass types. ■

### ABOUT THE AUTHOR:

Manfred Hayk is Application and Customer Support Manager at LumaSense Technologies

### FURTHER INFORMATION:

LumaSense Technologies GmbH, Frankfurt/Main, Germany  
tel: +49 69 973 73-0  
email: info@Lumasenseinc.com  
web: www.Lumasenseinc.com



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## FURNACE CAMERA

The BoilerSpection system consists of a special infrared thermal imaging camera with borescope lens (cooled lance optic) in a special protective enclosure with integrated cooling. This system allows users to 'see through flames' and constantly monitor the melting chamber of a glass tank.

This enables users to check the current status of the furnace lining, for example. Moreover, foaming and glass melt are continuously visualised and measured by the instrument.

## TEMPERATURE MEASUREMENT PYROMETERS

Continuous temperature monitoring in the conditioning area has become standard technology and is covered only sporadically by thermocouples, which are maintenance-intensive and immersed in the melt; they can also contaminate the molten glass.

LumaSense IS 50-LO/GL glass pyrometers can be easily attached on existing thermocouples and require only one air purge to permanently and securely measure the glass transition temperature in the forehearth.

## GOB TEMPERATURE SENSING

Fast and accurate LumaSense pyrometers measure the exact temperature of falling glass gobbs between the shears and forming machine. For this application, special pyrometers are used, which ensure the accurate and secure measurement of gob temperatures, despite the partial