Melt Down of Lead-in Wires

Temperature Monitoring in the Production of Light Bulbs

Q
Question

How can temperature be measured accurately during the melt down process of light bulb lead wires?

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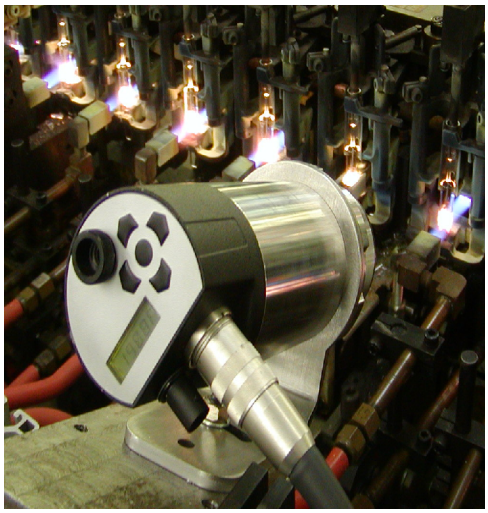
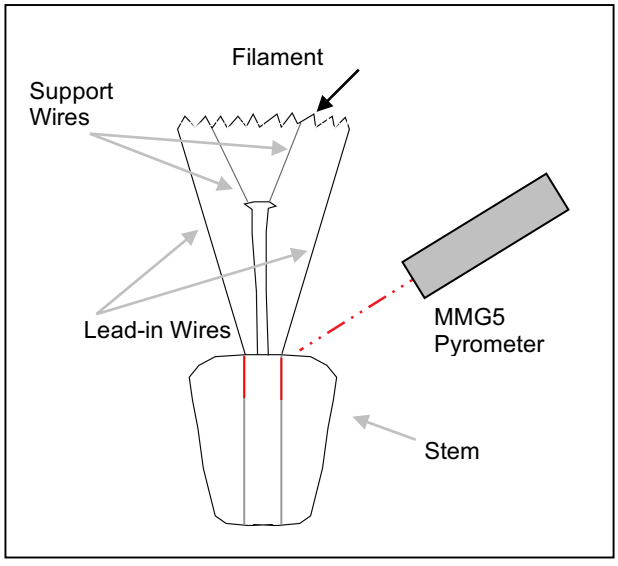
A
Answer

Situation Analysis

During the production process of incandescent light bulbs, both lead wires are pressed into the molten glass stem at temperatures of approximately 1000°C (1832°F). This process is extremely temperature sensitive and accurate temperature measurement is critical to a stable process. The EU directive 2000/53/EG demands that lead-free glass must be used exclusively for the production of light bulbs which narrows the optimum process temperature range in the new lead-free process.
Because of the small area that needs to be temperature controlled, placement of the sensor head and optical resolution must be carefully considered.



The temperature sensor monitors the melt down process of the lead-in wires.



The inner structure of an incandescent light bulb. The vertical red lines mark the melted down wire.

Raytek®
Fluke Process Instruments

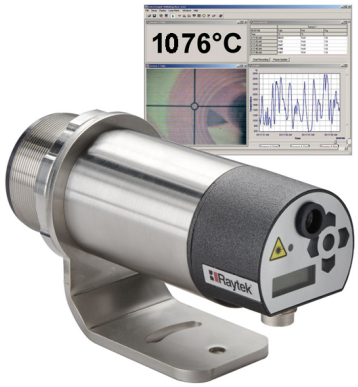
A
Answer

Solution and Improvements

The ideal solution for monitoring the melt down process of the lead-in wires is the Marathon series MMG5 pyrometer. With its spectral response of 5 µm the sensor is capable of measuring the glass surface exclusively and not through the glass.

Optical resolution up to 70:1 and a minimum spot size of 1.1 mm make the MMG5 pyrometer ideally suited for detecting small measuring points. With the help of through-the-lens sighting with video or laser aiming, sensor alignment is performed simply and precisely. The DataTemp Multidrop software allows for easy remote sensor configuration and control.

For high ambient temperatures up to 175°C (350°F) the Air/Water-Cooled Housing would be required.



MM5G Sensor configurable via DataTemp Multidrop Software

Air/Water-Cooled Housing with Air Purge for MMG5 Sensor

Raytek Product

- Marathon MMG5

Accessories

- Air/Water-Cooled Housing with Air Purge
- DataTemp Multidrop Software

Benefits

- Increased Productivity
- Improved Light Blub Quality

For customized solutions to your process, please contact: _____

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* Photos: courtesy of pixelio.de