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Furnace Life Optimization Solution

Libbey Furnace Using SmartMelter®
Increases Campaign Life by 25%

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Libbey Glass has played a key role in the development of SmartMelter® technology. Mr. Sperry, Global Furnace Leader at Libbey Glass, first connected with PaneraTech CEO Yakup Bayram at the Glass Problems Conference in 2010 and has worked alongside the PaneraTech team with Libbey's support since that time. They built several test furnaces, have done several furnace trials, and have gone through several sensor developments. Mr. Sperry shared how the use of SmartMelter® technology led to the delay of a furnace rebuild and increased production in a Shreveport furnace.

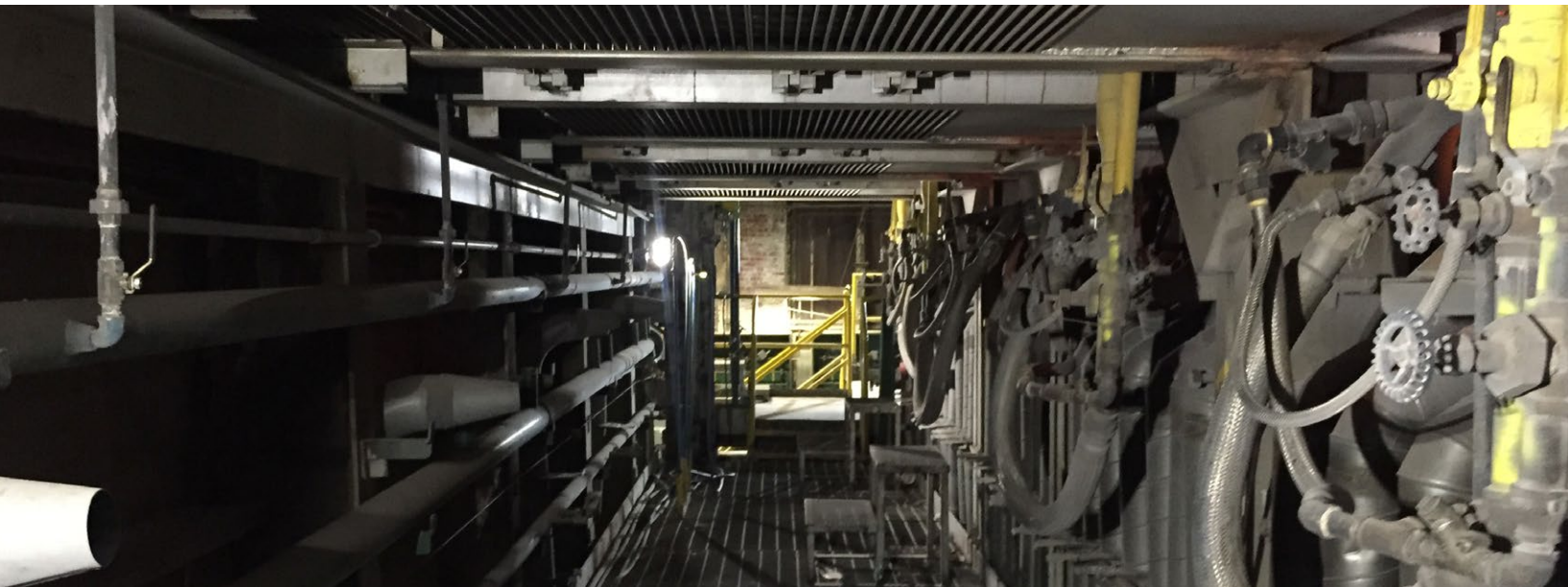
A Comprehensive Furnace Health Program

As part of its comprehensive review of overall furnace health, Libbey uses a robust furnace inspection methodology to predict furnace rebuild dates. First, they look at operational data and compare it to historical data. They also do regular interior inspections with an endoscope camera and exterior inspections with infrared camera. This process now includes a SmartMelter® inspection to examine sidewall thickness and to check for glass penetration into the insulation.

Delaying the Overcoat

The furnace at Shreveport is a tableware furnace that melts low-iron, oxidized soda-lime glass. The furnace was scheduled, based on operational data, for overcoat maintenance in December 2015. Libbey was concerned that the current operational mode was significantly different from the historical operation, enough that the historical data would not be sufficient for accurately determining a scheduled rebuild date.

In October 2015, two months before the scheduled overcoat, a SmartMelter® inspection was performed on the furnace. The data from the inspection showed that over two inches (50 mm) of thickness remained at the metal line and the sidewall insulation was secure. Because of this clear picture of the furnace's state and the capability they now had for regular inspection, Libbey made a more confident maintenance decision to postpone the overcoat for another year with a commitment to monitor the metal line and insulated areas regularly.



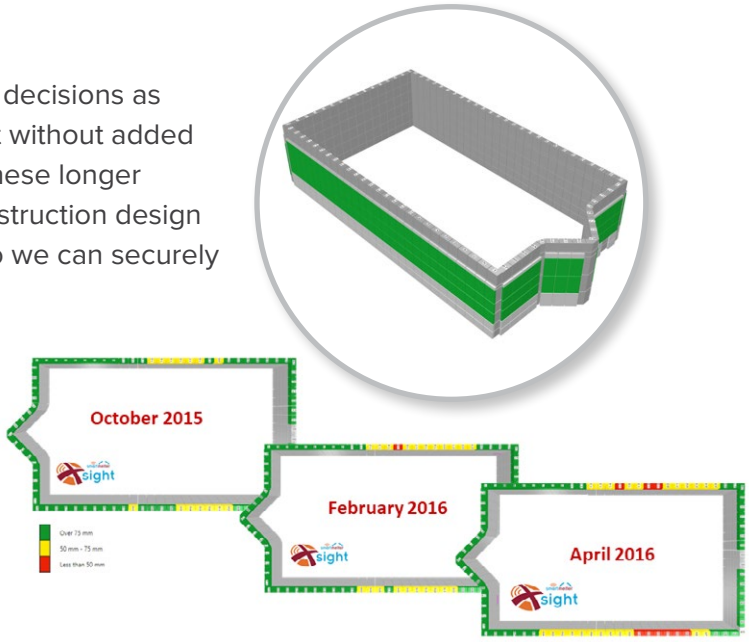
Delaying a Cold Repair

Throughout the next year, the metal line AZS thickness and sidewall insulation was continuously monitored to ensure that the scheduled overcoat would not be needed before December 2016. The overcoat was performed as scheduled on the sidewalls at the end of the year. However, this led to another important decision. The furnace cold repair was pushed to a later date.

“The Smart melter monitoring allowed us to have confidence to go further and postpone the rebuild further,” Mr. Sperry explained. He continued, “One of the things I like about the technology is checking the heavily insulated areas of the furnace below the metal line, making sure that the sidewall containment and bottom is in good shape. I mean I’ve had a couple of instances of phone calls in the middle of the night saying ‘We’ve got glass leaking out through one side.’ When I can go around and check the melter integrity, it gives me more confidence to push out the repair date. Of course, when we are making these decisions, we also take into account the health of the superstructure and regenerators as well. With the technology we are getting longer, more secure campaign life length.”

Data-driven Decisions

Mr. Sperry pointed out that these results affect other decisions as well. “Extending the time between cold repairs is not without added intermediate and cold repair costs,” he explained.”These longer campaigns are causing us to review our furnace construction design in all areas, upgrade materials and change design so we can securely extend life on the next campaign. The technology has the added effect of improving furnace design.”

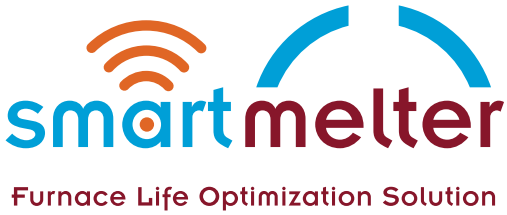


Increased Production

Libbey regularly monitors the sidewall insulation and overcoat thickness using SmartMelter®, and this will continue until the furnace is shut down. SmartMelter® monitoring is part of a holistic evaluation that also takes into account the health of the superstructure and regenerators.

“This furnace will have melted 25 percent more glass at the end of its campaign than any other Libbey furnace in history,” Mr. Sperry commented. “We think we’ve got the risks contained to do that. So that’s how we’re using the technology.”

Furnace Health Monitoring with SmartMelter® has made a significant impact on furnace campaign life and productivity at Libbey Glass. Secure containment in the areas of the furnace that they cannot monitor accurately gives the company confidence to extend repair significantly past the repair dates that are indicated by historical furnace data. This leads to longer campaigns and larger return on their assets.



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