



Furnace Life Optimization Solution

# Refractory Thickness Sensor (RTS) **Blind Trial at a Float Line**

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## INTRODUCTION

PaneraTech was approached by a leading global float glass manufacturer to demonstrate our Refractory Thickness Sensor (RTS) measuring residual fused-cast AZS thickness on a float line furnace.

The manufacturer chose a float furnace that was based in Europe. The blind trial date for the furnace was scheduled to be performed in time for hot repair. SmartMelter RTS measurements were performed about one week before the hot repair.

PaneraTech submitted a report of the measured fused-cast AZS thickness to the float manufacturer prior to the hot repair. The glass manufacturer then lowered the glass level to a safe level and recovered the blocks during the hot repair. The glass manufacturer later measured the actual fused-cast AZS block thicknesses at the measurement spots and compared the measurements with PaneraTech's RTS sensor readings. The overall results demonstrated that PaneraTech's RTS sensor had measured wall thickness within 0 -5mm (0.2inch) of the actual block thickness.



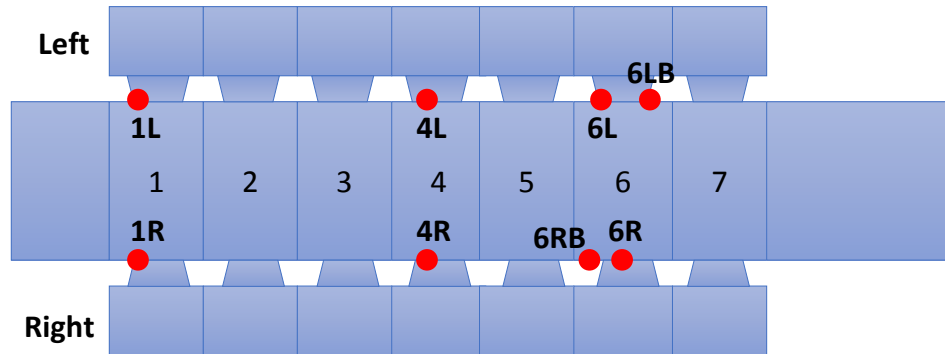
**Figure 1**  
Trial Team: Representatives from Float Glass Manufacturer and PaneraTech (Yakup Bayram CEO and Alex Ruege, Principal Engineer)



## MEASUREMENT SPOTS

The float line furnace was a cross-fired furnace. Measurements were taken on a total of 8 blocks (see Figure 2) at both left and right side of ports 1, 4 and 6.

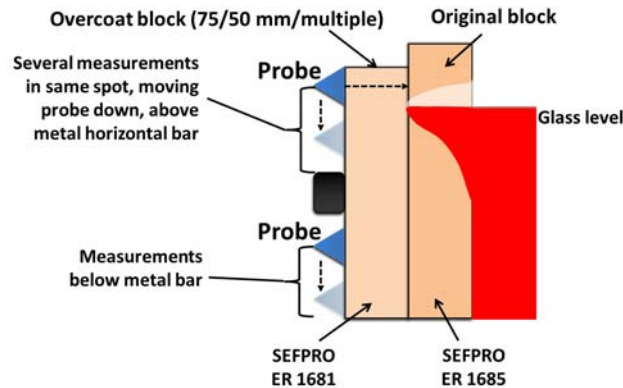
Figure 2  
Furnace Layout and Measurement Spots



## WALL STRUCTURE AND MEASUREMENTS

The overcoat blocks were supported by a horizontal metal bar in the middle. The measurements were taken with the RTS sensor through fused-cast AZS overcoat blocks (32% AZS) at the metal line (above the metal bar in the middle) and also below the metal bar (see Figure 3). The configuration of the blocks and the measurement process is shown in Figure 3. Depending on the location at the port, the overcoat blocks had thicknesses ranging from 50 mm (2in) to 75 mm (3 in). In some locations, there were multiple overcoat blocks.

Figure 3  
Wall Layout at Float Furnace



Gratings that were holding the overcoat blocks in place were cut prior to measurements to allow for access to the exposed AZS as shown in Figure 4.



**Figure 4**  
Each measurement spot was marked properly

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**Figure 5**  
PaneraTech team member taking measurements on the furnace

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## THE RESULTS

After lowering the glass level, all of the blocks were successfully recovered. The actual thickness of each block was measured with the float line manufacturer team. The original tank block had completely eroded at the glass level for most of the blocks.

The RTS sensor successfully measured the thickness of the residual AZS for these five spots within 0-5 mm (0.2 inch) accuracy as shown in Table 1.

**Figure 6**

Pictures of Some of the Blocks  
Recovered During Hot Repair



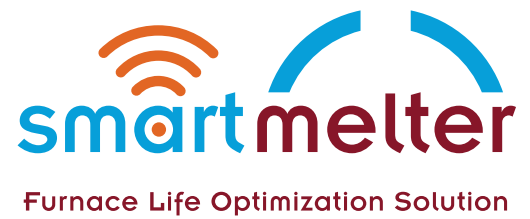
Spot Number	SmartMelter RTS Sensor Reading	Actual AZS Block Thickness	Difference
1L Top (Glass Line)	73 mm	75 mm	2 mm
1L Bottom	75 mm	75 mm	0 mm
1R Top (Glass Line)	75 mm	75 mm	0 mm
1R Bottom	75 mm	75 mm	0 mm
4L Top (Glass Line)	36 mm	39 mm	3 mm
4L Bottom	50 mm	50 mm	0 mm
4R Top (Glass Line)	34 mm	35 mm	1 mm
4R Bottom	49 mm	50 mm	1 mm
6L Top (Glass Line)	59 mm	64 mm	5 mm
6L Bottom	75 mm	74 mm	1 mm
6LB Top (Glass Line)	68 mm	72 mm	4 mm
6LB Bottom	74 mm	74 mm	0 mm
6R Top (Glass Line)	64 mm	66 mm	2 mm
6R Bottom	73 mm	72 mm	1 mm
6RB Top (Glass Line)	58 mm	62 mm	4 mm
6RB Bottom	75 mm	75 mm	0 mm

**Table 1**  
 Comparison of Actual Block Thickness with RTS Sensor Measurements  
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This blind trial clearly demonstrated the accuracy of the RTS sensor for measuring fused-cast AZS thickness on operational float line glass furnaces.

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## CONCLUSION



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