

Calderys insulating concept: Multilayers



BACKGROUND
Customers needs



CONCEPT
Calderys solution



SUMMARY
Recap of
the solution



RESULTS
Concrete
benefits



The background situation

The tundish is the last reactor vessel before the end of casting, and is therefore the most critical equipment to overall steel quality.

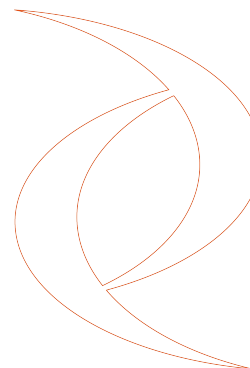
To have effective and efficient continuous casting, the steel temperature needs to be controlled. While tundish powder and lids play a significant role to control heat loss from the top, the loss through the tundish vessel side walls still remains but can be reduced.



The request from the customers

Temperature control within the continuous casting tundish is highly important, as liquid steel within the tundish is typically only 30° C above liquidus (in order to provide the necessary solidification within the mold).

Then, any significant temperature loss can mean a loss of casting strand, especially in multi strand billet casting.





Analysis of the customer request

By examining the progressive heat loss over time, the heat loss can reach as high as 6.95 kW/M2.

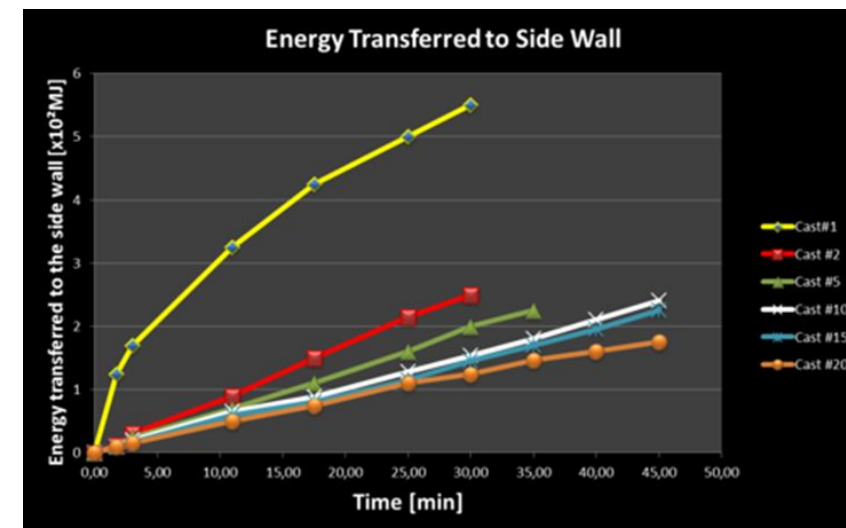
The customer needs to lower this heat loss as much as possible, to enhance the control of the casting process.

A realistic target was defined around 20% reduction of the heat loss.

Calderys Solution

The Calderys Multi Layer approach can reduce this heat loss by up to 35%, to 4.50 kW/M2.

By implementing such a multi layer concept, with carefully chosen insulating board, insulating castable, completed with Calderys high grade permanent lining, this multi layer effect gives the best in class insulating, with high durability.

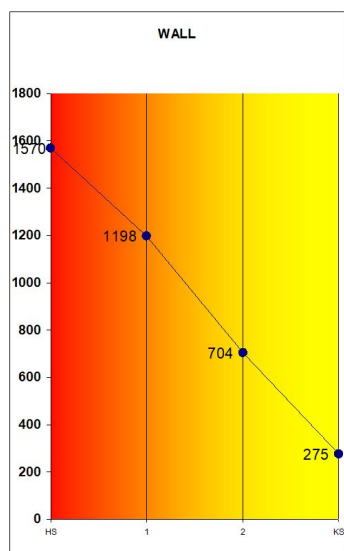




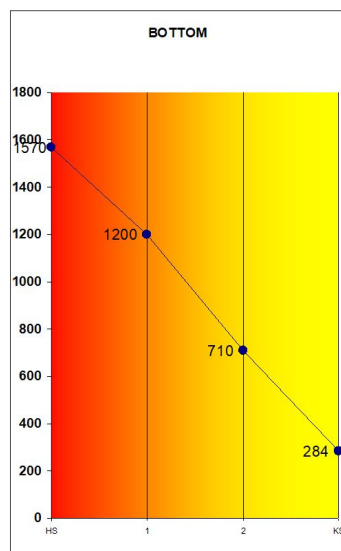
Benefits brought by the solution

When comparing the different lining configurations, the resultant heat loss benefits are clear.

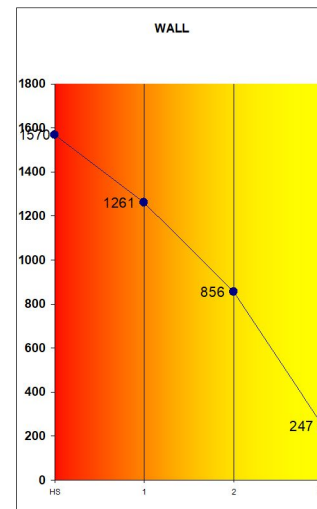
Standard Configuration - Shell Temperature of 275/284°C



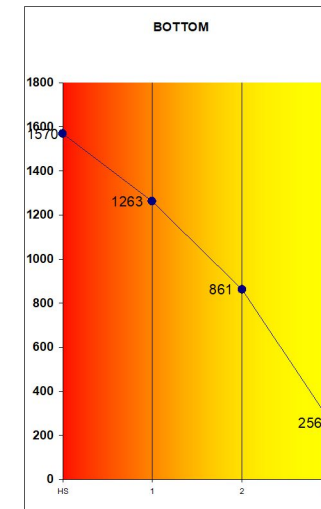
- 1: CALDE™ MAG SPRAY G 89
40mm
- 2: CALDE™ CAST LB 80 HR
120mm
- 3: CALDE™ GUN
MW STRONG LITE
30mm



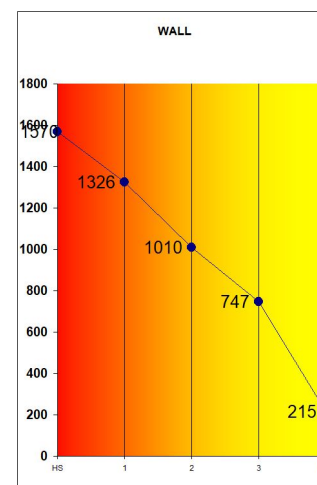
First Layer Configuration - Shell Temperature of 247/256°C



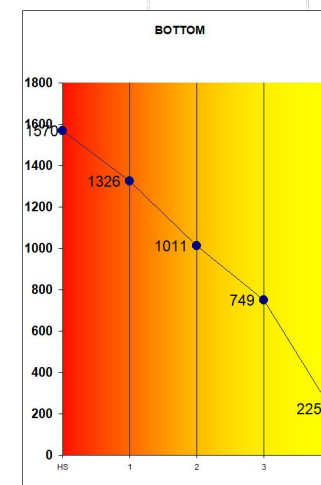
- 1: CALDE™ MAG SPRAY G 89
40mm
- 2: CALDE™ CAST LB 80 HR
120mm
- 3) DURABOARD CT
10mm



Multi Configuration - Shell Temperature of 215/225°C



- 1: CALDE™ MAG SPRAY G 89
40mm
- 2: CALDE™ CAST LB 80 HR
120mm
- 3) CALDE™ GUN
MW STRONG LITE
30mm
- 4) DURABOARD CT
10mm





Product presentation

CADLE GUN MW STRONGLITE:

By Introducing this special insulation product, installed by GUNNING over the insulation board, it contributes to **reduce the heat loss by 35%**.

Only a 30mm layer of MW STRONG LITE is required to give the desired results.



Plant A	Material	S (mm)	TC (W/m.K)	T interface (°C)	Heat Loss (kW/m²)
WEAR	CALDE™ MAG SPRAY G 89	40	0,55	1570	6,95
PERMANENT	CALDE™ CAST LX 58	120	1,695	1198	
INSULATION	CALDE™ GUN MW STRONG LITE	30	0,496	704	
	Steel shell			275	

Plant B	Material	S (mm)	TC (W/m.K)	T interface (°C)	Heat Loss (kW/m²)
WEAR	CALDE™ MAG SPRAY G 89	40	0,55	1570	5,75
PERMANENT	CALDE™ CAST LX 58	120	1,748	1261	
INSULATION	DURABOARD CT	10	0,15	856	
	Steel shell			247	

Plant C	Material	S (mm)	TC (W/m.K)	T interface (°C)	Heat Loss (kW/m²)
WEAR	CALDE™ MAG SPRAY G 89	40	0,55	1570	4,50
PERMANENT	CALDE™ CAST LX 58	120	1,771	1326	
INSULATION	CALDE™ GUN MW STRONG LITE	30	0,3	1010	
	DURABOARD CT	10	0,15	747	
	Steel shell			215	

Thank you for your attention

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