Calderys ladle trial process

BACKGROUND
Customers needs

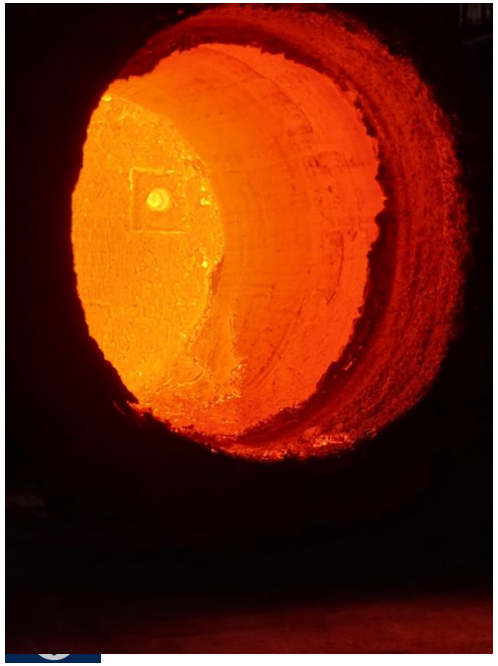
CONCEPT
Calderys solution

SUMMARY
Recap of
the solution

RESULTS
Concrete
benefits

The background situation

The customer was looking for a new entrant into the supplier loop, to challenge the incumbent supplier group.
Other competitors were reaching a typical lifetime of 30 heats (4676 contact minutes - 155 minutes on average) with a remaining residual thickness of 60mm.



The request from the customers

- Bringing new product with tailor made solutions, in order to improve average performance.

The customer has the following process parameters:

- **500k tonne p.a.**
- **EAF>LF>VOD(100%)>CC**
- **Carbon / Alloy / Stainless Steel product Mix**

Ladle capacity	Ton	100
Total Ladles in plant	No	14
Total Ladles in Operation	No	6
Av Heats / day	No	18 (14 - 22)
Preheating Time	Hours	16
Preheating T°	°C	1100
Maximum Tapping T°	°C	1760 (Alloy Steels)

Average heats / campaign	No	60
Slag Zone replacement		Yes at 30 heats
Lining weak point		Slag Line purging zone
Number of Relines per year	No	>100
Specific Consumption of Ladle Gunning	Yes	200 t per year
Number of porous plugs	No	1
Average Steel residence time/heat	Min	180
Max Steel residence time/heat	Min	400 (Alloy Steels)
Fluorspar addition using		NO

Calderys offer

The Calderys proposal was to provide a duel zone slag line: one for the purging zone area (66%), and one for the none purging zone.
Whilst the customer only used one purge plug at one time, there was two possible purging locations depending on purging plug life/availability.

Calderys Solution

Calderys offered two products from its deep product portfolio.

The ladle slag line (None purging) is made of **CALDE BRICK MC R 7026**, magnesia resin bonded carbon brick based on fused magnesite with high refractoriness and slag resistance.

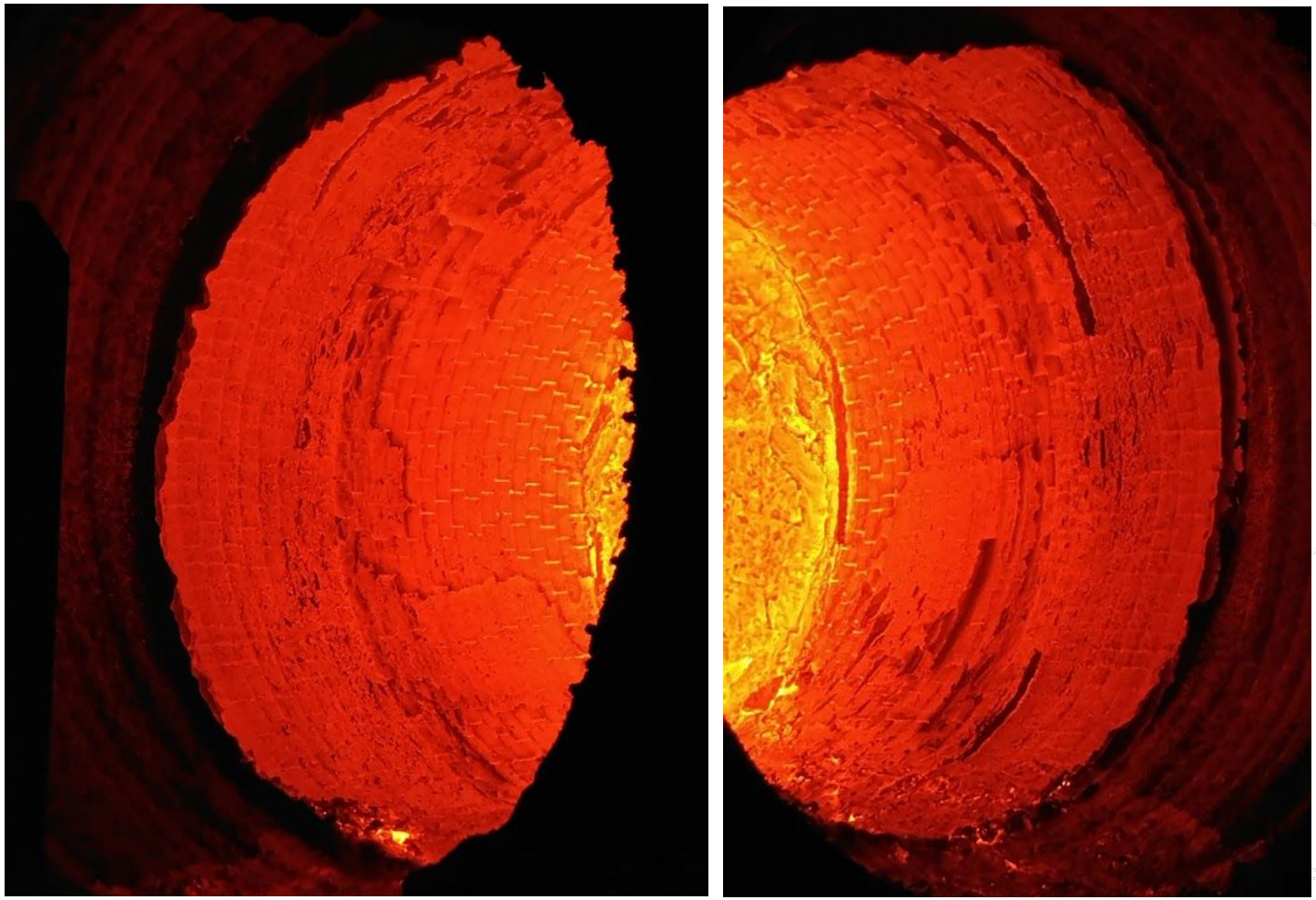
The ladle slag line is made of **CALDE BRICK MC R 8026** magnesia resin bonded carbon brick based on fused magnesite LC with high refractoriness and slag resistance, manufactured in our plant in Turkey.

Benefits brought by the solution

The ladle slag line performance for the original lining was 3**0 heats, with over 4000 contact minutes**. Residual thickness were well in excess of the required minimum of 60mm, with the lowest measurable point being 115 mm within the slag line.

The free board area did show some thinner sections, being as low as 70mm in places, but the customer would typically progress some lip ring / freeboard gunning in normal circumstances, but this was required for the Calderys trial.

30 heats



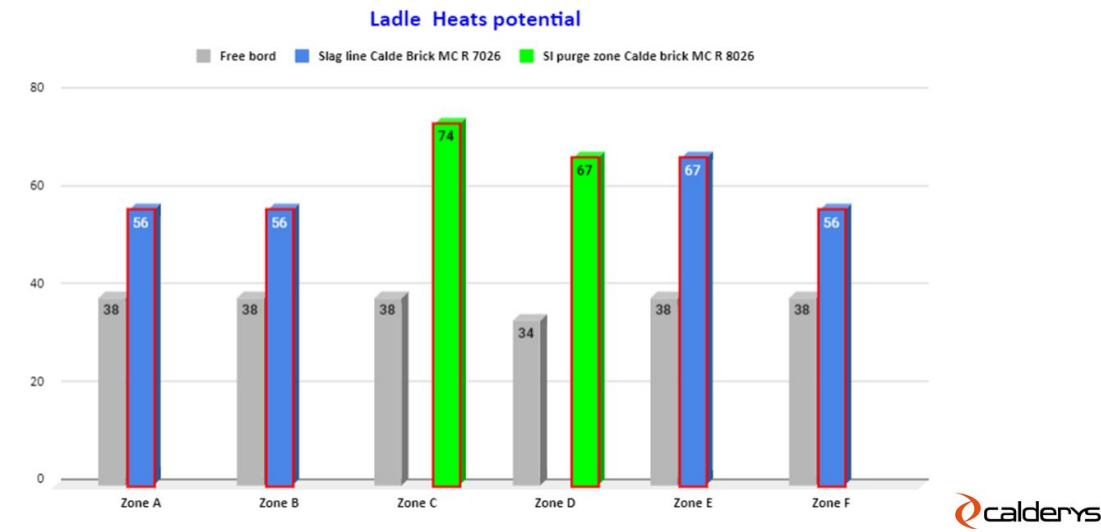
Product selection validated, next steps

The slagline product selection combination of 7026 and 8026 has proven successful, and has changed the dynamic in terms of the potential lifetime of the ladle.
Indeed, with such a significant increase in lifetime, other factors will need to be closely considered to ensure that any new lifetime is fully realised, the performance of the purging block, wellblock and other elements of the lining will need to be reviewed to ensure these elements do not become the new bottleneck.

Trial results — 2- Thickness Analysis >Bricks Potential

	Potential evaluation considering a minimum residual acceptable of 60 mm					Heats performed	30	
Layer	Zone A	B	C	D	E	F	Weakest point potential	
	Deslaging		Purging Plug		Weel block			
31	38	38	38	34	38	38	34	Free Bord Sintered MGO 8%C MK 6 152 mm
30	41	45	45	41	41	45	41	
29	45	45	45	45	48	48	45	
28	53	53	45	45	48	53	45	
32	56	56	74	74	67	56	56	Calde brick MC R 7026 MK 7/8 7/30
31	61	61	83	74	67	61	61	
30	67	67	83	74	74	67	67	Calde brick MC R 8026 MK 7/8 7/30
29	67	67	83	67	74	67	67	
28	74	74	83	67	74	74	67	
27	83	83	83	67	74	83	67	
26	83	83	83	74	93	108	74	
25	93	93	93	83	127	127	83	CALDERYS TRIAL
24	127	127	127	127	127	127	127	
23	127	127	127	127	127	127	127	
22	127	127	127	127	127	127	127	
21	127	127	127	127	127	127	127	
20	127	127	127	127	127	127	127	

Trial results — 2- Thickness Analysis >Bricks Potential



Thank you for your attention

Visit www.calderys.com for more information

or connect with us:

www.linkedin.com/company/calderys/

www.facebook.com/calderys/