

Date 27/03/2025 Glaze cone 8

Time	Target temp	Target °C/hr	Upper Temp	Deviation	Rise per hr	Lower Temp	Lower rise per hr	Difference	HeatX top temp	HeatX base temp	Fire-box temp	Rear vent	Front vent	Low P regulator	Main Pressure /Bar	2ndary air open %	Flue open %	Notes
9:15	10	150	10	0		10		0				100%	0%	1	-	100%	100%	Pilot needle valve 50%. Spyholes open
9:30	48	150	20	-27.5	40	20	40	0				100%	0%	1		100%	100%	Erratic - fixing second thermocouple connection
9:45	85	150	30	-55	40	20	0	10				100%	0%	1		100%	100%	
10:00	123	150	25	-97.5	-20	20	0	5				100%	0%	1		100%	100%	Closed spyholes
10:15	160	150	56	-104	124	33	52	23				100%	0%	1		100%	100%	
10:30	198	0	75	-122.5	76	44	44	31				100%	0%	4		100%	100%	
10:45	198	200	81	-116.5	24	46	8	35				100%	0%	4		100%	100%	
11:00	248	200	88	-159.5	28	50	16	38				100%	0%	4		0%	20%	Closed secondary air damper & flue
11:15	298	200	109	-188.5	84	65	60	44				100%	0%	4		0%	20%	Actual time of reading was 11:20
11:30	348	200	115	-232.5	24	69	16	46				100%	0%	4		0%	20%	
11:45	198	200	126	-71.5	44	78	36	48				100%	0%	4	0.500	0%	20%	End of preheat. Target temp reset. Read about 11:55
12:00	248	200	630	382.5	2016	240	648	390								0%	20%	Read on time.
12:15	298	200	815	517.5	740	385	580	430										Kiln atmosphere clear. Read on time.
12:30	348	200	895	547.5	320	565	720	330		122								
12:45	398	200	962	564.5	268	645	320	317	200	125	75							Heat exchanger top temp >200°C
13:00	448	200	977	529.5	60	730	340	247										
13:15	498	200	1008	510.5	124	818	352	190										
13:30	548	200	1058	510.5	200	902	336	156										
13:45	598	200	1078	480.5	80	957	220	121										Slight blackening at chimney exit
14:00	648	200	1080	432.5	8	984	108	96						1		25%		Temp rise on increasing 2nd air. FFD cut out. Restarted
14:15	698	200	1141	443.5	244	1018	136	123		250					1.000	100%		Monitoring firebox temp
14:30	748	200	1169	421.5	112					269							50%	Can't see top cones. Already down?
14:45	798	200	1196	398.5	108					290			50%					Stalling until flu open
15:00	848	200	1181	333.5	-60	1150		31					30%		2.000		100%	
15:15	898	250	1200	302.5	76	1163	52	37										Red figure at 15:30 estimated for heat loss calculation.
15:30	960	250	1150	190	-200	1163	0	-13										FFD cut out. Backfired on reconnecting. Turned off
15:45	1023	250	1014	-8.5	-544	1039	-496	-25										All gas turned off, closed up kiln.
16:00	1085	250	917		-388	942	-388	-25										Actual time was 16:05
18:00	1110	-200	540		-188.5	541	2164	-1										Included for cooling rate

### Comments

**Warm-up:** Should minimise air through kiln in warm-up. Close spyholes and chimney damper

**Main heating:** Much faster than expected or planned. Led to big difference between top and bottom

**Bag wall:** Higher than needed. Should allow more heat through to lower levels

**Early stages:** Chimney damper and secondary air damper should be used to control vertical heat distribution

**Stalling:** Temperature stall around 13:45. Insufficient air. Chimney damper is a key control

**Reduction:** Blackening at flue damper indicated reduction starting around 13:45. Substantial later. Glaze colours confirm reduction firing.

**FFD cutout** Indicates pilot flame was diverted from thermocouple possibly by abrupt changes in secondary air damper at 14:00.

**FFD cutout** Further cutout at 15:30, audible backfire on re-ignition and temperature stalled. Consistent with combustion in preheat firebox. NB Ignition temperature of propane in air is 455°C

**Backfiring:** Blakened around both venturis and leaks in mixing pipe. Soot deposit in roof of firebox. Consistent with reverse draft through heat exchanger.

**Overheating:** All heat exchanger and firebox components comprising cement boards and portland cement castings failed through heat damage. Glass reinforced Secar71 was undamaged.