DATAPAQ

www.datapaq.com

FURNACE TRACKER

...for Slab Reheat

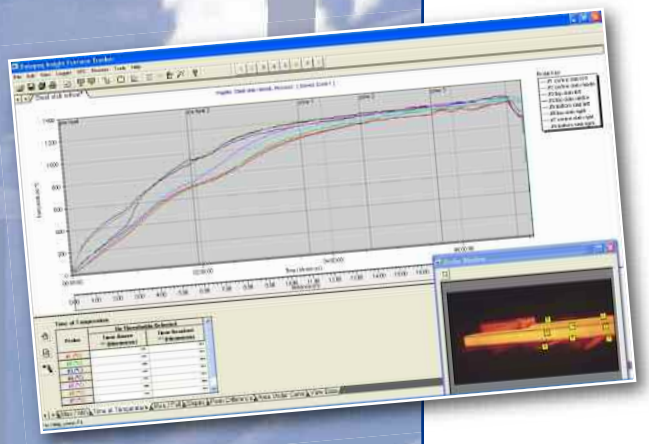
Built for the steel industry, the DATAPAQ Slab Reheat system monitors the temperature profile of the slab at different points throughout its thickness as it travels through the furnace.

The system consists of one or two data loggers, which in operation are protected by a special low height "phased evaporation" insulation system. This is designed to keep the data logger at a stable operating temperature, while the temperature in the furnace environment may be in excess of 1300°C.

DATAPAQ's powerful, yet easy to use Insight analysis software allows a fast and accurate temperature analysis of the run, which can be made within minutes of the slab leaving the furnace. The software is designed specifically for furnace users and includes all the analysis screens necessary to give maximum information on the process.

The data logger, thermal barrier and software are designed and manufactured by DATAPAQ to ensure the highest possible accuracy, compatibility and quality.

Full instructions on preparation of the slab are provided by DATAPAQ and a commissioning service is also available.



SYSTEM BENEFITS

- Ensures slab achieves correct drop out temperature throughout thickness
- Helps to optimise process, reducing energy consumption, increasing throughput and minimising scale
- Accurate results for verifying and updating mathematical furnace control models

SYSTEM FEATURES

- Designed to travel through the furnace with the steel slab, no need for trailing thermocouples
- High accuracy data logger ±0.3°C
- Starts automatically on entering the furnace by temperature or time trigger
- Powerful Furnace Tracker Insight analysis software
- Replaceable insulation
- Low height system for low clearance furnaces
- Easy to set up and use
- High thermal capacity barrier able to cope with stoppages during the trial due to roll changes

TECHNICAL SPECIFICATIONS

TPAQ21 DATA LOGGER

Model Number:	TP2186 (8 channel), TP2116 (10 channel)
Temperature Range:	-100°C* to 1370°C
Maximum Operating Temperature:	110°C
Memory:	130,000 data points
Number of Channels:	8 or 10
Sampling Interval:	No telemetry, 0.1 sec – 50 mins RF telemetry, 3 secs – 50 mins (TP2116 only)
Accuracy:	±0.3°C**
Battery:	VHT Lithium
Battery Life:	Up to 250 hours
Thermocouple Type:	K (type N also available)

*Contact Datapaq for accuracy at -100°C to -190°C
**Using sampling interval >0.8 seconds over range shown.

EVAPORATIVE THERMAL BARRIER

The thermal barrier contains various layers of insulation which slow down the passage of heat and create a temperature gradient within the system. The first insulation layer consists of Alumina Fibre blanket which has a maximum operating temperature of 1600°C and protects the evaporative thermal barrier. Inside the thermal barrier water slowly boils off and creates an environment where the temperature does not exceed 100°C, the working temperature of the data loggers. The inner insulation layers contained in the evaporative water jacket are structured to significantly boost the thermal capacity of the overall system, ensuring optimum performance during the process. The evaporative thermal barrier features "floating plate" technology to minimise distortion at high temperatures. The evaporative barrier TB4133 contains a smaller barrier TB4132 which is designed to accept two Tpaq21 data loggers, offering them maximum protection against internal condensation, also heat when removing loggers from barrier.

Capacity:	24 litres
Thermal Duration:	9 hours at 1200°C constant temperature

INSULATION CAGE

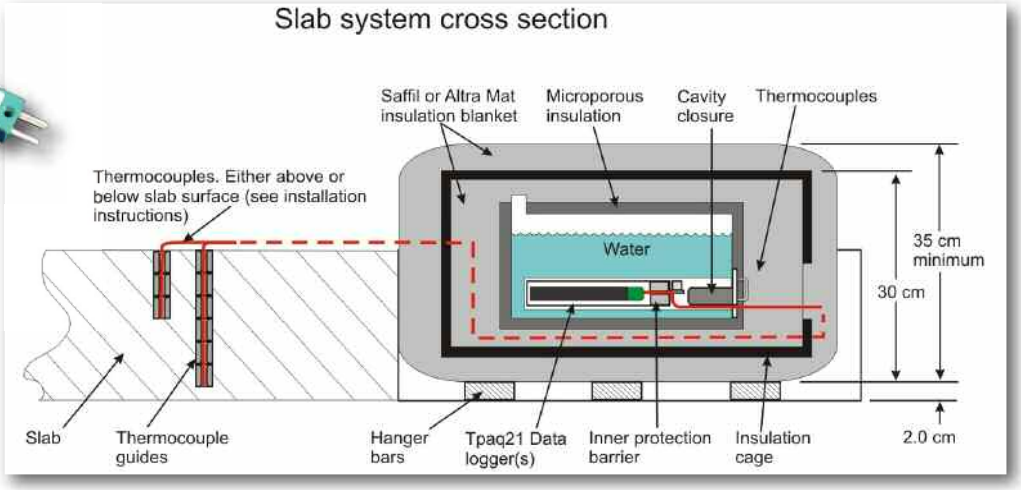
The complete system is housed in a high grade alloy cage which holds the outer Alumina Fibre blanket insulation in place and affords some mechanical protection if the slab discharges from the furnace on a ramp.

Dimensions (H x W x L):	300mm x 575mm x 687mm

THERMOCOUPLES

The thermocouples supplied with the system are mineral insulated type K to ANSI specification MC 96.1 (Special Limits of Error). They have a special high temperature outer sheath.

Part Number:	PA076? - where the ? denotes length in metres from 1 to 9 metres (e.g. PA0761 = 1 metre length)



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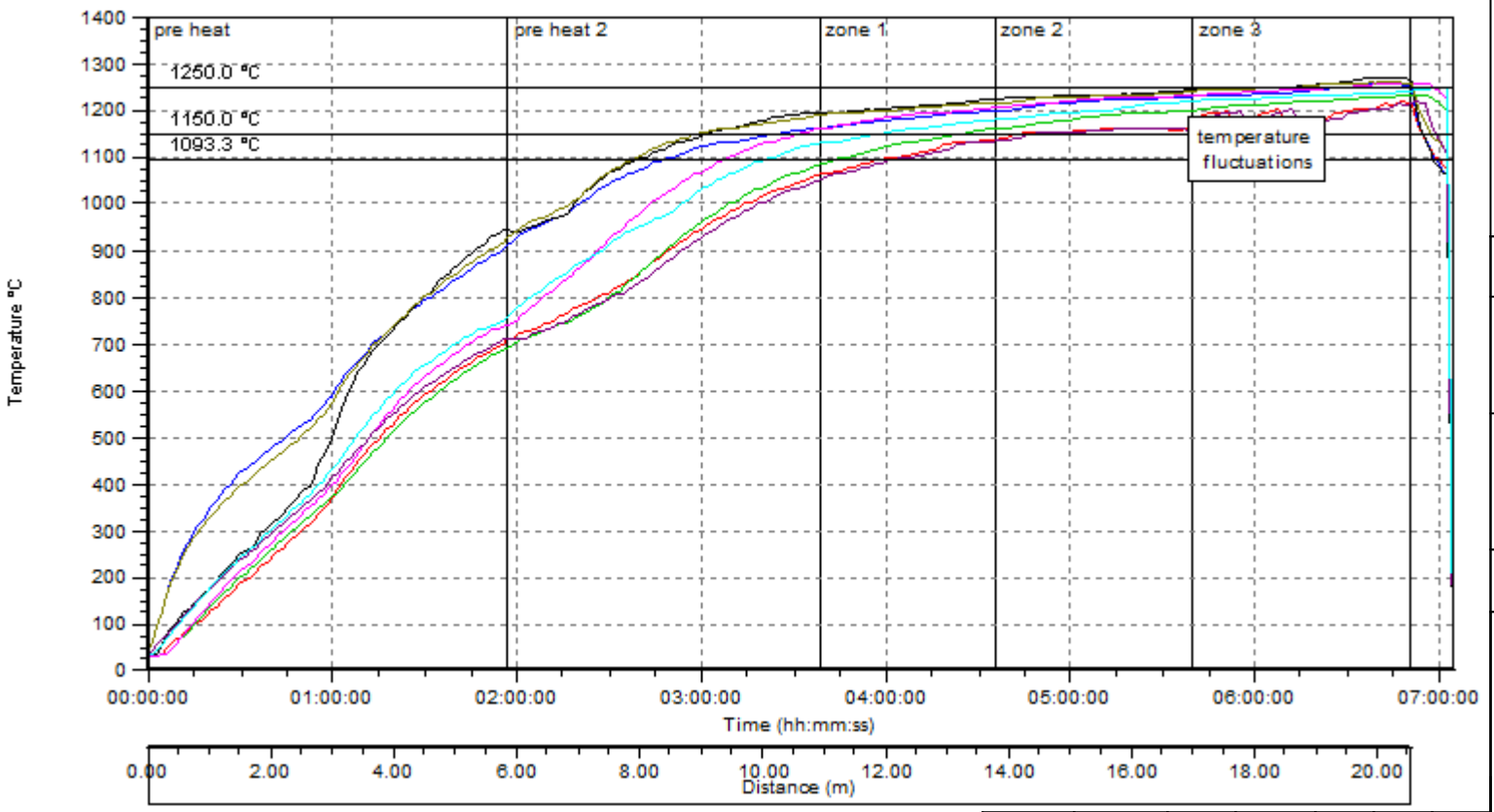
File: Steel slab reheat.paq	Company: DATAPAQ	
Site: CAMBRIDGE / Process:	Product: slab	Data Collection Details:



Line Speed:	Zone:	pre heat	pre heat 2	zone 1	zone 2	zone 3
0.05 m/min	Length (m):	5.84	5.11	2.82	3.25	3.52
	Upper (°C):	0.0	0.0	0.0	0.0	0.0
	Lower (°C):	0.0	0.0	0.0	0.0	0.0

Created By	Download
Number of Probes	8
Sample Interval	1:30.00 (mm:ss.t)
Data Loaded	20/12/1994 15:38:00
Collection Started	31/12/1999 00:01:06
Logger ID	#1000
Operator	EEC
Process	
Furnace	
Recipe	
Product	slab
Time Printed	17/06/2011 08:56:23

Notes:

first run in slab reheat furnace
temperatures set
zone 1 1250
zone 2 1250
zone 3 1255

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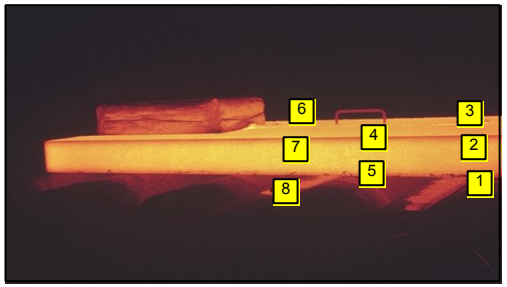
A Fluke Company

Probe Map:



Probe	Maximum / Minimum				Time at Temperature				Slopes		Peak Difference			Area Under Curve	
	Maximum (°C)	Max. Reached (hh:mm:ss)	Mean (°C)	Deviation From 0.0°C	Time Above 1093.3°C (hh:mm:ss)	Time To Reach 1093.3°C (hh:mm:ss)	Time Above 1150.0°C (hh:mm:ss)	Time To Reach 1150.0°C (hh:mm:ss)	Positive Slope (°C/min)	Mean Slope (°C/min)		Peak Difference (°C)	Time Reached (hh:mm:ss)	Area (°C)hr	Area (Zoom) (°C)hr
#1 (°C) centre slab left	1219.0	06:48:00	870.0	+1219.0	03:01:30	03:58:30	02:12:00	04:43:30	***	2.58				6176.57	6176.57
#2 (°C) centre slab middle	1236.0	06:52:30	884.3	+1236.0	03:21:00	03:43:30	02:40:30	04:24:00	***	2.70				6278.35	6278.35
#3 (°C) top slab left	1256.0	06:42:00	997.5	+1256.0	04:12:00	02:48:00	03:31:30	03:24:00	***	2.04				7081.69	7081.69
#4 (°C) top slab centre	1273.0	06:40:30	991.6	+1273.0	04:19:30	02:39:00	03:54:00	03:01:30	***	2.31				7039.79	7039.79
#5 (°C) bottom slab left	1261.0	06:49:30	935.0	+1261.0	03:57:00	03:07:30	03:33:00	03:31:30	***	2.68		275.0	02:34:30	6638.47	6638.47
#6 (°C) top slab right	1264.0	06:37:30	1009.1	+1264.0	04:27:00	02:37:30	04:00:00	02:58:30	***	2.10	1086.0			7164.30	7164.30
#7 (°C) centre slab right	1219.0	06:52:30	874.8	+1219.0	03:01:30	04:03:00	02:12:00	04:48:00	***	2.50	811.0			6210.95	6210.95
#8 (°C) bottom slab right	1251.0	07:03:00	928.1	+1251.0	03:43:30	03:21:00	03:07:30	03:57:00	***	2.55				6589.38	6589.38