

Heating of Soaking Pits

CONTROL BY PLATINUM THERMOCOUPLES

For a number of years after the installation of circular soaking pits at the Ebbw Vale works of Richard Thomas and Baldwins Limited it was found that some ingots in a load were not achieving the correct temperature for rolling. This was an irregular occurrence, but became more frequent when oil firing replaced the older system of firing with a mixture of blast furnace and coke oven gases and was then traced to irregularities in the flow of oil to the eight burners placed tangentially round the pit.

The first attempt to rectify the trouble involved fitting each burner with an orifice plate and checking periodically with a portable manometer. While this effected a certain amount of improvement, the results were not all that could be desired, and the time occupied in checking became considerable.

The temperature of the soaking pit was controlled thermostatically by means of a platinum : rhodium-platinum thermocouple, but this controlled only the total flow of fuel to the burners and not its distribution among them.

It was realised that to ensure an even temperature to all ingots more temperature determinations would have to be made around the pit, and as an experiment three additional couples were mounted so that, with

the control couple, readings were taken at intervals of 90° round the circumference.

Preliminary tests showed that variations ranging from 150 to 200°F occurred round the pit. From these readings the operator was able to adjust his burners to ensure even heating, but further development of this practice was found to be desirable.

A three-point recorder is now installed in addition to the control recorder so that both operators and management can see instantly whether temperatures are steady all round the pit, rise together to the maximum of 2400°F, and remain there during the soaking period.

This simple system has proved very effective and economical. The net average heating efficiency of the ingots now works out at 9½ to 10 therms per ton, while the life of each thermocouple is about four months.

The couples are 34 inches long, mounted inside sillimanite sheaths, these being encased in carborundum outer sheaths 2 inches OD by 1 inch ID and 36 inches long, projecting 3 inches into the soaking pit.



A circular soaking pit at the Ebbw Vale works of Richard Thomas and Baldwins Limited. Two of the four control thermocouples can be seen projecting from the wall