

Ironmaking Mathematical Modelling Blast Furnace Charging



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Modern blast furnaces are frequently fitted with the Paul Wurth Bell-less top (PWT) charging system. This very flexible system can give greatly improved furnace operation, but it is often difficult to envisage the overall effect a proposed change to charge patterns will have on stockline shape, size and material distribution. Similar problems are encountered when using moveable throat armour (MTA) on furnaces with bell feed systems.

To overcome such problems a comprehensive trial on a full scale installation was undertaken and used as the basis of a mathematical model. This model has been further refined during trials on operating furnaces.

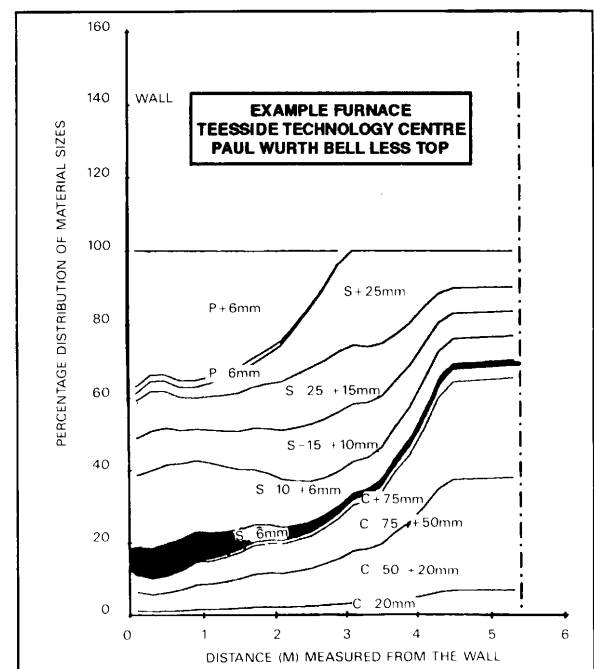
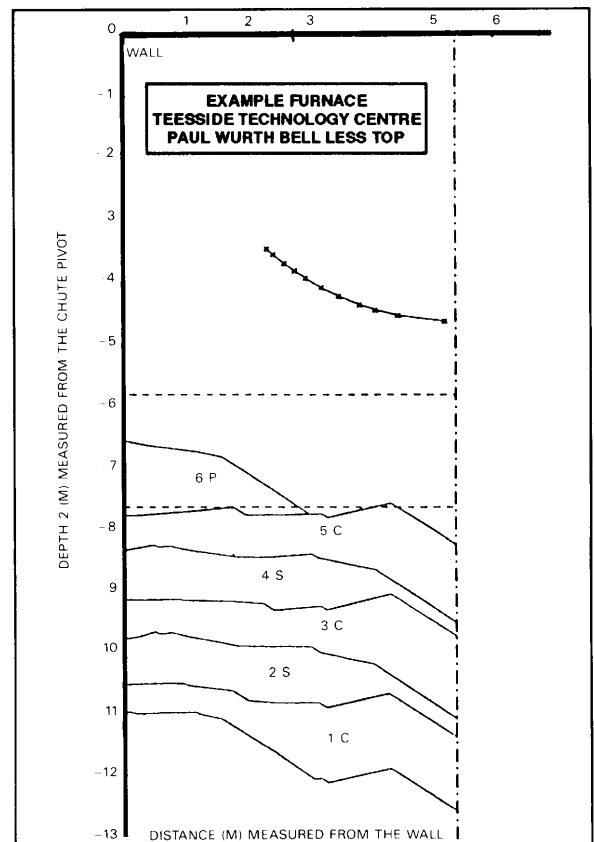


PAUL WURTH TEST RIG

The model, which is used extensively within Corus and has been sold to other steelmaking companies, is being used continuously on operating furnaces or investigatively "off-line" to give the following displays, many of them graphics, which are of great value to furnace management:-

- Stockline geometry (illustrated)
- Layer formation
- Material falling curves
- Material size distribution on stockline (illustrated)
- Ore to coke ratios and size distribution across the furnace
- Provides essential information to furnace operators, using data collected from furnace probes to monitor changes to the burden distribution system (from wear, deformation or breakdown)
- Helps prolong furnace life (>15 years)
- Assists with maximising furnace operating efficiency
- Off-line prediction of effects of changes to burden distribution
- Essential tool for understanding the characteristics of the installed burden distribution system (MTA or PWT)

The model is available for direct purchase, or via a bureau service, to assist with the design of installations or investigation of operations.



USE OF PAUL WURTH MODEL TO DETERMINE LAYER SHAPE AND SIZE DISTRIBUTION