SUB BURDEN PROBE
MONITORING OF GAS COMPOSITION AND TEMPERATURE WITHIN THE BURDEN MATERIAL

BENEFITS
The Sub Burden Probe is available as a standard or customized solution adapted to suit the customers' existing plant. The probe can be installed at any level inside the blast furnace down to the cohesive zone, and when installed in conjunction with the VAIron expert system, can provide the means to optimize furnace charging models.

FIELD OF APPLICATION
Blast furnace – temperature and gas monitoring

FUNCTION
The travelling sub-burden lance probe is used to monitor gas composition and temperature within the burden material at any level inside the blast furnace down to the cohesive zone. The probe lance is typically located approximately four metres below the surface of the burden and travels from furnace wall to furnace centreline, pushing its way through the hot burden material consisting of coke, iron ore, and sinter. It allows the blast furnace operator to determine the gas composition, so that the internal conditions of the furnace can be predicted and adjustments to the operating practice can be made. With knowledge on the gas composition, the operator can determine the optimum rrequirements / position for the next batch of burden material to be charged into the furnace.

The sub-burden probe consists of an obround water-cooled travelling lance that enters the furnace horizontally through an actuated isolation valve. In order to push its way through this dense hot material, a drive force of up to 70 tonnes is required. Once at the centre line, the lance withdraws to the furnace wall, halting at 500 mm intervals to take a sample or 'sniff' of the gas. The gas is fed back to an analyser mounted outside the furnace to determine the gas composition. To maintain gas tightness whilst in the furnace, the lance passes through a stuffing box with a series of lubricated seals, and a hydraulically-actuated isolation valve mounted on the furnace branch. A bellows unit at the furnace allows differential movement between the furnace shell and the tower structure (on which the rear of the frame is mounted).

PRODUCT MODEL RANGE
- Sub burden probe
- Hydraulic or electric drive

1 | Dome isolation valve 2 | Flexible hose/cable 3 | Twin hydraulic drive

Technical data
Modular gas sampling tip and multiple-thermocouples for temperature monitoring
Hydraulic drive motors via planetary gearboxes and a chain-driven carriage
Lance position monitoring by encoder throughout the extent of its travel
Gas sampling, cabling and services via a flexible cable / hose carrier
Positive isolation by a hydraulically-operated dome valve with inflatable seal and emergency manual operation

SERVICES

- Integration engineering
- Erection advisory
- Commissioning advisory
- Logistics
- Spare parts

OTHER CUSTOMERS BOUGHT ADDITIONALLY

- Radar Stockline Recorder
- Mechanical Stockline Recorder
- Above Burden Temperature Probe
- Profilemeter
- Dome type isolation valve and stuffing box

Primetals Technologies Ltd
A joint venture of Mitsubishi Heavy Industries and partners

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