

Batch Pilot – an update on progress in casthouses around the world

Batch Pilot determines the weight of metal in a furnace by sensing changes in hydraulic pressure in the furnace tilting cylinder together with changes in the position of the furnace as it tilts. Its success is underlined by the fact that 17 have been installed since the first trials in 2003.

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In the July/August 2006 issue of Aluminium International Today a newly developed casthouse technology for measuring furnace heel and transferred weight with an accuracy of +/-200kg, known as BatchPilot, was described in detail⁽¹⁾.

The system works on the principle of measuring changes in the hydraulic pressure in the furnace main cylinder with the furnace tilt angle. A key feature of the system is its ability to detect build up of dross on the furnace lining and to take this into account in determining an accurate heel weight.

The earlier paper described how the equipment had been in routine production use since March 2004 at Aleris, Duffel and later at Talum, Kidricevo with excellent results with respect to accuracy achieved. Improving yield through reduction in the number of under length and over length casts together with increasing furnace productivity due to a significant increase in the proportion of 'right first time' analysis casts were already providing excellent returns on capital invested.

Today there are over twenty casthouses worldwide where the system is being fully used and the aim of this update is to review the scope of these installations and draw on the experiences gained to make a number of detailed conclusions on the benefits of the BatchPilot system.

BATCHPILOT WORLDWIDE

Up to the end of 2006 eleven units had been installed and were in operation. Of these the first had been installed in Canada in 2003 as the initial prototype unit and then the second installed and extensively tested as the alpha site unit at Aleris, Duffel in 2005. This was followed by the installation of a further three units in 2005 and six in 2006 as shown in **Table 1**.

During 2007 the pace of installation has increased with a total of ten units installed or being commissioned by year end (**Table 2**).

In addition a further thirty units are currently under discussion with fifteen of these expected to be installed in 2008.

Based on experience gained after installing and commissioning more than twenty BatchPilot units worldwide for a variety of applications and locations the following conclusions can be reached:

- The BatchPilot system is truly accurate to 0.5% of the nominal furnace capacity for heel weight measurements and 1% for full furnace weight measurements. So for a typical 50 tonne furnace this means determining the heel weight to +/-250kg and the full furnace weight to +/- 500kg
- Installation can easily be made without disrupting normal production. A shutdown period is not required. The equipment is usually delivered one to two months before the targeted commissioning period to allow ample time for site installation prior to the arrival of the Hades Inc commissioning engineers. Once on site the commissioning engineer requires five days per unit to check, calibrate and complete the sign-off for the installation.
- Once installed the system is robust and reliable in operation. Re calibration is only required if there is some material change in the furnace fixed weight or in any event as a check once every 12 months. Re calibration can be easily carried out by plant personnel.
- Accurate knowledge of heel, transfer

and full furnace weights enables many aspects of furnace operation to be optimised leading to:

- An increase in percentage of 'right first time' analyses and reduction in number of spectroscopy samples needed for analysis;
- Reduction or elimination of short casts;
- Increase in the number of ingots that can be cast in certain formats;
- Improvement in yields through reducing over length casts;
- The net result of all this is the possibility of increased output through reduction of furnace delays and improved productivity.

As the number of units installed has increased around the World, it has become evident that where the casthouse has a plc controlled process control system, BatchPilot can become an integral and essential part of the total system. The two units currently under commissioning have been equipped with the capability to be operated automatically with the first weighing in the sequence, the heel weight measurement, being triggered by a signal from the furnace plc when the furnace has sat down after the end of casting. It seems likely that this is the way in which the majority of BatchPilot systems will be installed to operate in casthouses in the future.

Country	Furnace (metric t)	Number	Application
Canada	35	1	Improve furnace availability and cleaning
Belgium	50	2	Remelt-to reduce yield loss caused by over length ingots
Holland	30	1	Remelt-increase production
Slovenia	35	1	Smelter-increase production from scrap remelter
Canada	50	1	Continuous caster
Germany	45	2	Remelt- increase production, cast more ingots
Germany	45mt	2	Smelter-increase production from scrap remelter

Table 1 BatchPilot units installed to end of 2006

Country	Furnace (metric t)	Units	Status
Germany	120	3	Remelt-commissioned, operating
Belgium	40	1	Remelt-commissioned, operating
Australia	60	2	Smelter-commissioning
United Kingdom	50	1	Smelter-commissioning
Sweden	35	3	Remelt-installation and commissioning

Table 2 BatchPilot units installed during 2007

¹ John H Courtenay, Accurate measurement of furnace heel and transferred weight, Aluminium International Today, 18 No 4 July/August 2006, pp 48-51.