

Consistent quality - continuous sensing

Customer end product quality requirements, especially in canned stock, is constantly increasing and becoming more stringent. One vital part of Norwegian company Elkem's answer - a triangulation sensor based on a SiTek PSD from the Swedish company Selcom.

Elkem Aluminium A/S is a major supplier of metal used to make tabs and end stock for beer and beverage cans. In 1992 Elkem installed its Computer Assisted Casting System including the Laser Level Control System as part of a five-year modernisation plan. It is controlling the casting parameters during start-up, steady state and end of casting and is continuously collecting data from the process including the preparation stage. The focus was, as stated above, that customer requirements were rising, calling for a response from the company.

As in all casting systems, the best place to increase quality and yield is by controlling the level in the launder and mold accurately to ensure consistency, as well as by steering the furnace more precisely. Besides, Elkem also decided to cast with low metal level to improve slab quality. For this to be accomplished, Elkem needed better sensing equipment. After a thorough evaluation, the company chose Selcom non-contact triangulation sensors.

Main advantages

The main advantages of lasers based non-contact sensors are:

The sensor has no moving parts, which improves the dependability. The distance from the sensors to the liquid metal surface is about 250 mm during casting, compared to only 100 mm for conventional inductive and capacitive sensors. Non-contact sensors do

not create additional skim and no danger of presolidification and freezing during start-up. Extra space in the troughs at the location of the sensors is not necessary.

By now Elkem uses non-contact sensors in three ways:

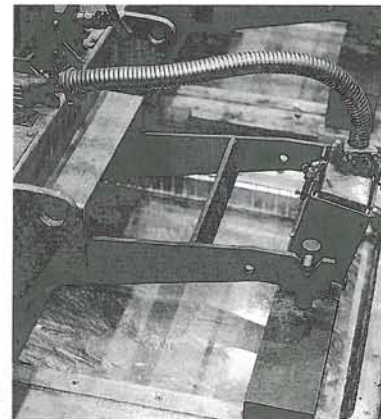
1. To control trough level and furnace tilting.
2. As an integral part of the mold level control system installed at each coquille.
3. To determine the remaining volume of melted metal in the furnaces.

Though the last purpose was not planned for, it has become a vital part in holding down waste and saving time. The Elkem Laser Level Control System of casting with a low level has a number of advantages, many of which lead to shorter casting times, less after-working and lower costs.

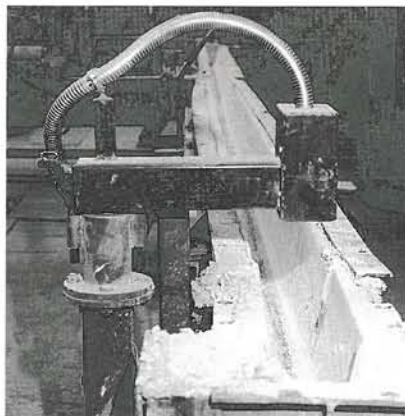
Variation in the metal level in the mold is less than $\pm 0,25$ mm, and casting length accuracy controllable to within $\pm 0,5$ %. Less surface segregation, resulting in less scalping required. Accurate and repeatable casting lengths, for considerable cost savings. Lower and constant metal level provides an increased solidification rate, resulting in improved rolling properties and reduced edge-cracking, as well as smaller particles and no depleted zone.

In addition, since sensor maintenance is simple and the system as a whole, including the sensors, is reliable and dependable, there is less down-time.

The end results for Elkem is improved yield overall and lower costs, plus the added benefit of satisfied customers - no mean accomplishment in today's marketplace.



Level sensor with a long measuring range and stand-off distance gives easy installation, handling and reliable data from start-up to finish of casting.



Launder level control at a distance. Reliable accurate data without complicated calibration routines plus operator friendly installation.

