

Laser simplifies maintenance in casting plants

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The laser-based Simetal Opal measurement system by Siemens supports operators of continuous casting plants in the fast and precise alignment of strand guide rollers.

An optical measuring system developed by Siemens reduces maintenance requirements in continuous casting plants by simplifying the process for aligning the rolls along long lines between which hot steel strands are guided. All the rolls have to be precisely vertically aligned to ensure the mechanical stresses they are exposed to are equally distributed. Up into now, the roll positions have been measured and documented manually in an expensive process that's also prone to error.

The new laser system provides highly precise digital measurements that take less time to complete. Measurement data is sent directly to the control unit, which prevents errors caused by manual data transfer. The data also allows technicians to monitor conditions at the plant, which means maintenance can be carried out in line with actual needs rather than at set intervals, which was previously the case.

Continuous casting plants cast liquid steel into slabs a few meters long and several centimeters thick. These slabs are guided along long lines between rolls. The rolls must be precisely vertically aligned. If they are not, they will be exposed to varying levels of pressure from the slab and will also exert different levels of pressure on the latter, which can negatively impact slab quality and damage the roll bearings. The rolls are regularly calibrated to prevent these problems. The process involves removing individual segments of the strand guide line. Each segment contains several rolls, and measurements are taken by holding an iron ruler several meters long at a specific height above the rolls. Workers then measure the distance of each roll to the ruler and write down the results. This method takes time, can lead to errors, and becomes imprecise in the middle because the ruler bends at that point.

The new Simetal Opal laser measuring system measures all spots with equal precision and is very easy to use. The system's rotating laser emits beams that generate a reference line parallel to the top side of the rolls. A linear photodetector is vertically mounted on the rolls. The distance between a roll and reference line is determined according to which photodetector segment the laser beam hits. Workers move along the line and place the detector on each roll, whose alignment is then precisely measured down to less than one-tenth of a millimeter. Simetal Opal is part of a continuous casting plant monitoring concept developed by Siemens. The system can be integrated into existing plants and is already being used in the manufacturing process at the Siemens facility in Shanghai.

Provided by Siemens

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