

Industry: Metals**Application:** Speed Control

Accurate, Stable Measurements of Continuous Casters and Billet Casters

Profile:

Metals manufacturer

Solution:

LaserSpeed® Pro 9500

Results:

- ▶ Accurate measurement even at very slow speeds or zero speed
- ▶ Continuous measurement of speeds from zero up to its maximum speed —without any dead zones
- ▶ Non-contact measurement eliminates slippage and calibration errors
- ▶ Integrated system saves time and money previously spent on tweaking the mill control system to keep the product within specs
- ▶ Measurement and monitoring of mould oscillation predicts possible breakouts



Metal manufacturers have to complete the difficult task of measuring elapsed length and speed on Continuous Slab Casters and Billet and Bloom Casters. This application note describes how you can complete this task with ease using the LaserSpeed® Pro 9500 gauge.

The Challenges:

Measuring elapsed length and speed on Continuous Slab Casters and Billet and Bloom Casters isn't easy. One reason for the difficulty is the very slow speeds common during operation. Slab casters, for example, typically run at speeds between 30 and 80 in/min (76.2 to 203.2 cm/min) and billet and bloom casters typically run at speeds between 50 to 150 in/min (127 to 381 cm/min). Additionally, harsh environmental conditions and slag or scale on the surface of the product make accurate measurements difficult to obtain.

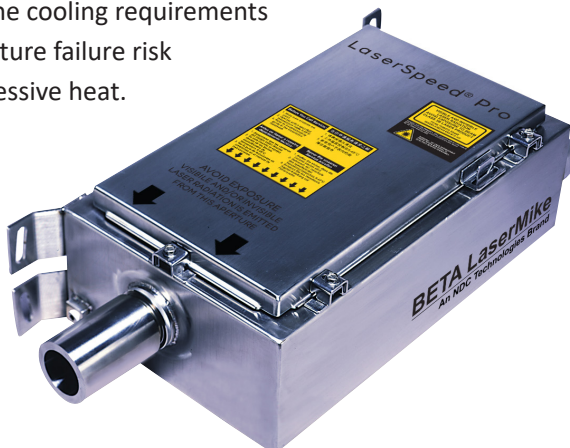
Measuring Slow Speeds

Typically, length and speed measurement for continuous casters are made using a tachometer connected to a roller or wheel that's in contact with the slab or billet. These mechanical systems are subject to slippage and calibration changes caused by changes in the diameter of the roll or wheel due to dirt build-up or wear. The measurement error of mechanical systems will change with mill conditions, requiring the mill operator to continuously check the cut length accuracy through hand measurements or weight measurements and then tweak the mill control system to keep cut lengths within specification.

The Solution:

The LaserSpeed Pro 9500 gauge can help you avoid these measurement pitfalls. The LaserSpeed Pro 9500 uses an acousto-optical modulator, allowing it to shift frequencies, as well as a unique down-mixing technique to ensure accuracy and resolution at zero speed and very slow speeds. The LaserSpeed Pro 9500 gauge is the only gauge that can make speed measurements continuously from zero speed up to its maximum speed specification, without any dead zones close to zero speed.

The non-contact LaserSpeed Pro 9500 gauge also helps you to eliminate the errors caused by roll or wheel slippage and errors caused by roll or wheel diameter changes. Maintenance costs are also reduced since the gauge can be mounted up to 9.3 feet (3.0 meters) for the slab or billet, reducing the cooling requirements and premature failure risk due to excessive heat.



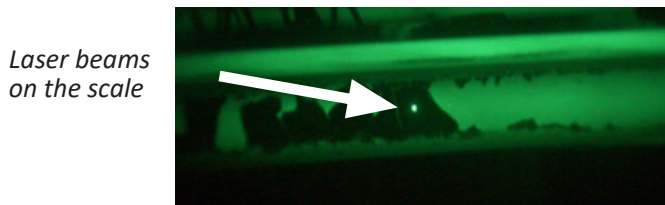
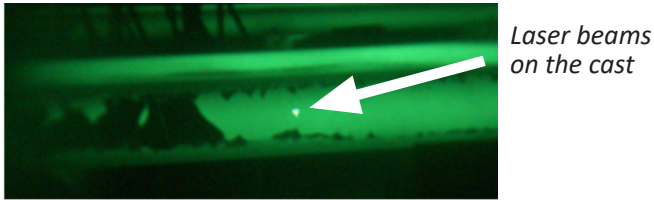
LaserSpeed® Pro 9500

The LaserSpeed Pro gauge shown on this page is inside a stainless-steel housing, installed on the side of a slab caster. The gauge is mounted on a linear rail that allows the gauge to be automatically positioned the correct distance from the side of the slab during width changes. Installing on the side of the slab has several advantages compared to mounting the gauge above the slab. The following are advantages to installing on the side of the slab:

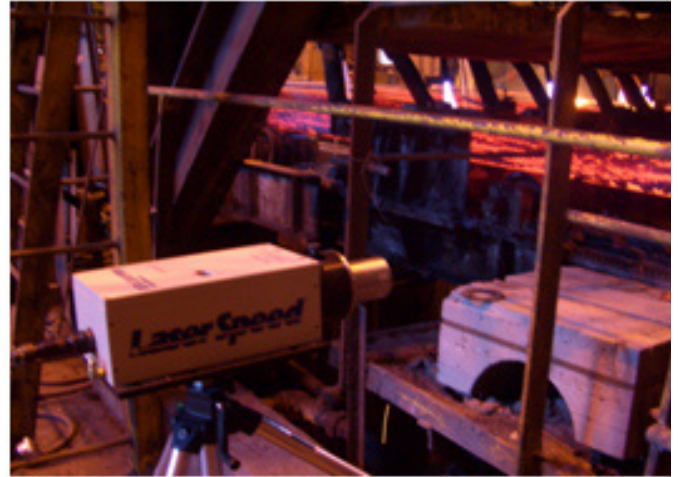
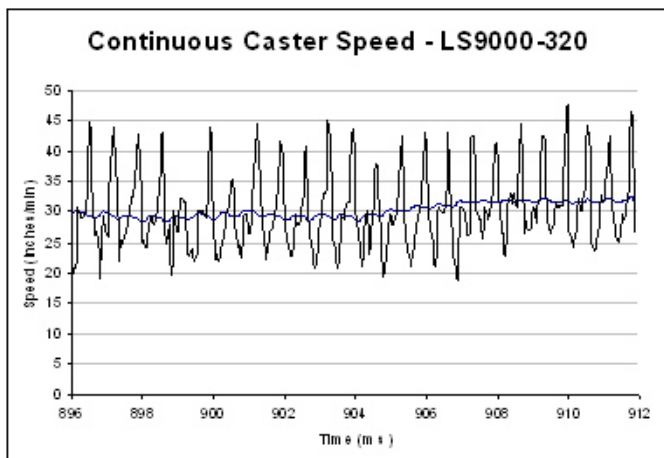
- ▶ It reduces cooling requirements
- ▶ It doesn't interfere with the overhead crane when mill maintenance is needed
- ▶ It eliminates the heat shimmer effect on laser measurements
- ▶ It allows the gauge to be pulled back for easy maintenance as required

The LaserSpeed Pro gauge eliminates the need for continual checks of cut length accuracy and constant tweaking of the control system. This saves money by producing the correct slab length required with minimal waste. The accuracy of the LaserSpeed Pro system is 0.03% of length, thereby producing more accurate and consistent slab lengths.

Laser beams on the cast and the scale are shown in the photos below. The LaserSpeed Pro gauge is able to obtain accurate measurements on both the cast and the scale.

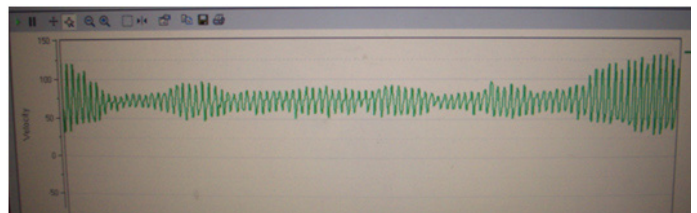


Speed measurements made by this system (see graph below) clearly show the effects of mould oscillation on the caster speed down by the torch cutter. Previous measurements presented on slab casters only showed a scattering of measurements throughout the speed range and were unable to follow the actual speed of the caster. Also shown is the average caster speed. The speed is also integrated to obtain length. The length can be used to control the torch cutter to obtain accurate slab lengths.



This photo shows the gauge measuring the length and speed of a billet caster. The gauge can be mounted from the top or the side for billet and bloom casters because the heat shimmer is much less to the lower mass of the billet and bloom.

The graph below shows speed measurements made on a billet caster. Due to the gauge's technological design, the gauge can follow the mould oscillation effect on the cast down by the torch cutter. When the cast sticks in the mould, the mould oscillation has more influence on the cast speed. As shown, the mould oscillation effect can vary quite dramatically.



The Results:

The LaserSpeed Pro gauge delivers the following benefits:

- ▶ Accurate measurement even at very slow speeds or zero speed, which is ideally suited to continuous caster and billet caster operation
- ▶ Continuous measurement of speeds from zero up to its maximum speed —without any dead zones— provides excellent speed and length measurement for continuous caster applications
- ▶ Non-contact measurement eliminates slippage and calibration errors that commonly occur with tachometers and contact wheels or rollers
- ▶ Integrated system saves time and money previously spent on tweaking the mill control system to keep the product within specs

The LaserSpeed Pro non-contact gauge is the most accurate, reliable, and cost-effective solution for measuring continuous casters and billet casters and ensuring product quality.

For questions or support go to: <https://ndc.custhelp.com/>

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