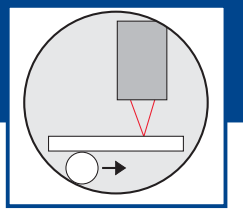
Continuous Caster

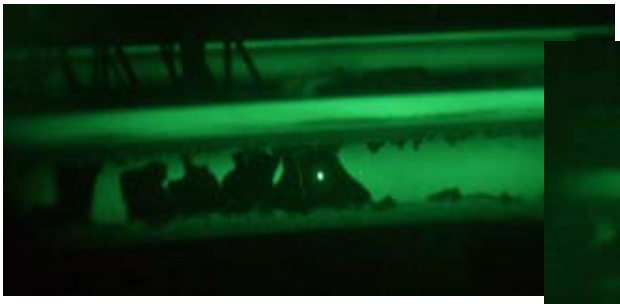


Measuring speed and length with Laser Doppler Velocimeters on Continuous Slab Casters and Billet and Bloom Casters has been very difficult in the past. This is due to the challenges faced by the mechanical system, which has to deal with heat, scale build-up, and the deterioration of mechanical parts.

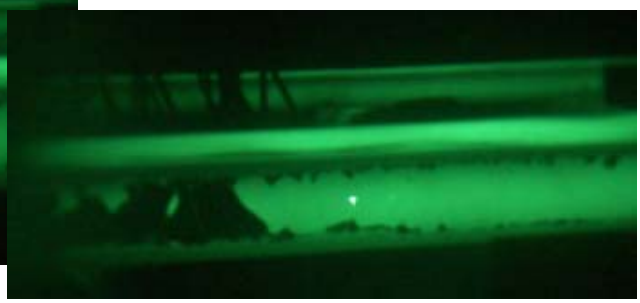
However, Beta LaserMike's LaserSpeed Gauge has the ability to measure these dimensions at very slow speeds. The LaserSpeed can measure speed and length even when the line is at a standstill, it can do so without any deadband, and it can measure the cast and the slag equally well. Slab caster lines typically run at speeds of 30 and 80 inches/min, and billet and bloom caster lines typically run at speeds of 50 to 150 inches/min.

The picture to the right shows a LaserSpeed performing measurements on a slab caster from the side. The gauge is mounted on a slide mechanism two meters away from the slab, which automatically keeps the gauge at the correct standoff distance during width changes. The gauge is also used to control a torch cutter, which makes it possible to obtain accurate and reliable slab length measurements.

The two pictures below show the LaserSpeed Gauge's laser beam, visible on both the cast and the scale. The LaserSpeed Gauge can measure on both cast and scale without any loss of measurement accuracy.

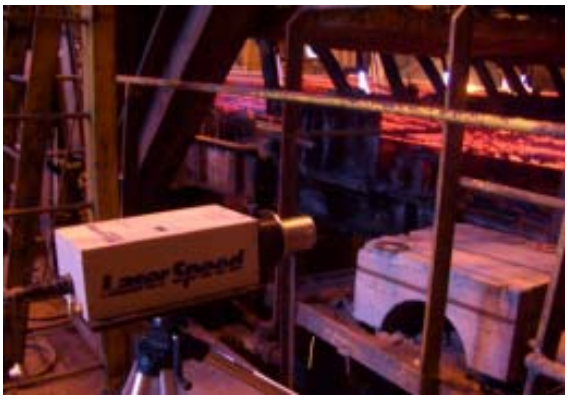


Laser Beams on scale

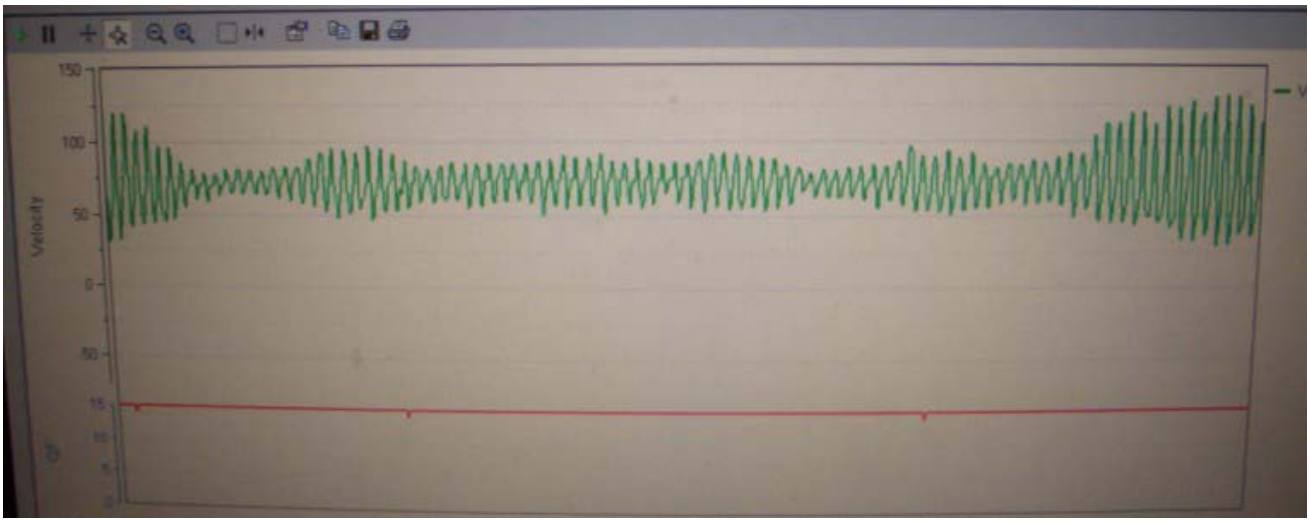


Laser Beams on cast

The LaserSpeed can also be used to control the torch cutter on billet and bloom casters. Billet and bloom casters have multiple strands, making it impracticable to measure all strands from the side. Typically, these type of casters are measured from the top.



In addition to controlling the torch cutter to improve the length of the cut cast, LaserSpeed gauges can also measure the speed influence of the mold oscillation on the cast, near the torch cutter. The picture below shows the mold oscillation's influence on the speed of the cast at the location near the torch cutter.



Strand speed near torch cutter

As shown above, the speed of the strand varies at the same oscillation rate as the mold oscillation rate. As the strand builds up more friction between the strand and the mold, the speed variations of the strand increase greatly. Shortly after this data was taken, the strand had a breakout and had to be shut down.