

## LSV Laser Surface Velocimeter



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Process control by non-contact  
speed and length measurement  
Product brochure

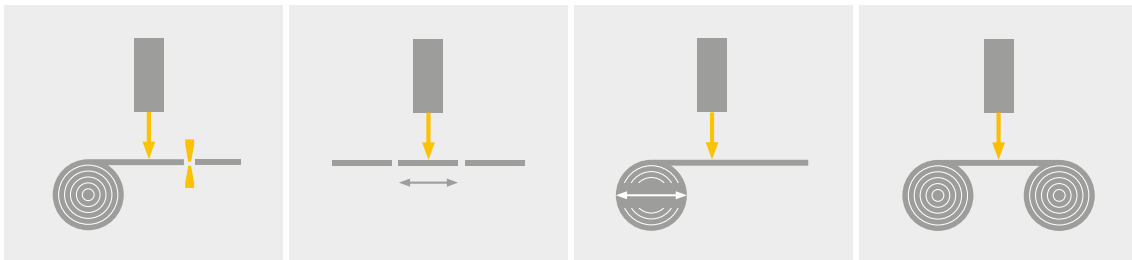


# Controlling production processes with optical sensors

## Yield, quality, throughput – Keep your process under control

When producing strip material, e.g. in steel mills or paper manufacturing, knowing the exact strip length and the current velocity is essential for optimizing your costs and processes. Here, Polytec offers solutions for precise process control. LSV Laser Surface Velocimeters are high-performance sensors for a reliable measurement of length and speed.

Thanks to the optical measurement the sensor captures length and speed reliably and without contact in challenging industrial environments. LSV offer a high level of robustness and process integrity at minimal maintenance cost.



**Cut-to-length control**

**Part-length measurement**

**Spool length**

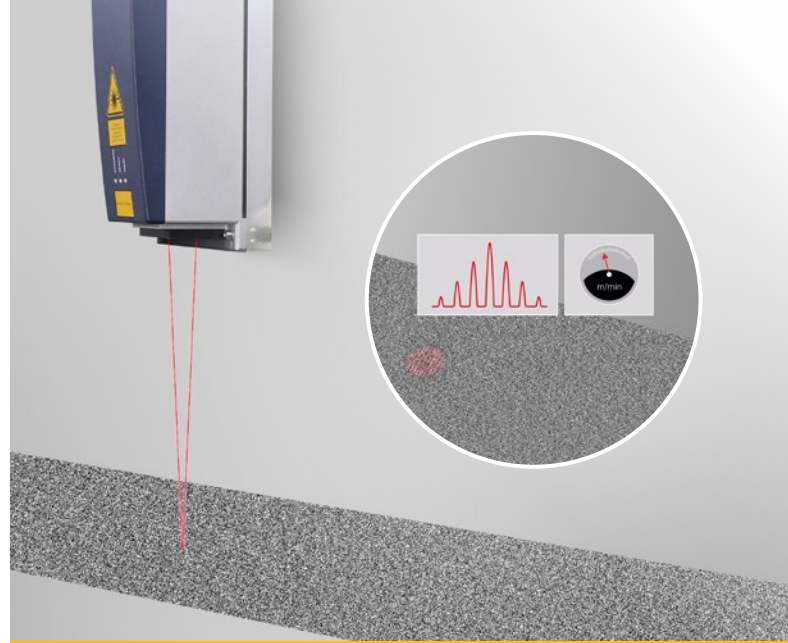
**Speed measurement and speed control**

Polytec LSV Laser Surface Velocimeters are used in many applications to optimize the process by reducing process variability. You will find them installed in applications such as cut-to-length control, part-length verification, total length on winders, line speed, differential line speed for stretch or elongation and many more.

# Accuracy with laser measurement

**Avoid process uncertainty and added costs caused by contact measuring techniques due to slippage, wear, damage to the product or maintenance.**

Accuracy, versatility and reliability make the LSV the perfect solution for a variety of measurement tasks in processes where precise, real-time speed and length data are critical. In addition, the LSV Laser Surface Velocimeter can reduce production costs by minimizing material scrap and optimizing product and process quality. The LSV can be applied easily and will replace less accurate and unreliable contact encoder and tachometer technology. The savings in reduced downtime, reduced variability and reduced maintenance provides an excellent ROI.



## How it works: the Doppler effect

LSV Laser Surface Velocimeters by Polytec use the laser Doppler effect to evaluate the laser light scattered back from the moving object. Two laser beams super-imposed on the surface generate an interference pattern of bright and dark fringes. As the surface moves through the fringe pattern, the intensity of the light scattered back modulates in frequency. This modulation frequency measured by the photo receiver of the sensor system is directly proportional to the surface velocity.

## Highlights of non-contact measurement



- Optimize your process with laser accuracy
- Non-contact measurement without slippage or impact on material surface quality
- Cut your material cost by avoiding waste
- Measure on all surfaces including shiny, matt, oily, structured and more
- Works even on small structures (wires, cables, fibers)
- Wear-free sensor technology without moving parts
- Easy to operate, gauge permanently adjusted\*

\* The extremely stable optics concept of the LSV does not require re-adjustment due to technical reasons. Local laws and quality control regulations may require recalibrations.



# ProSpeed® LSV laser sensors – achieve far more

## Highlights of the LSV



- High optical sensitivity for measurement on difficult surfaces and in difficult environments
- Flexible interface concept for easy process integration (Ethernet, serial interface, web interface, encoder output, various fieldbus protocols)
- Robust sensor technology for harsh and hot environments (IP66 and IP67); certified mechanical shock and vibration resistance
- High flexibility with up to 3 m long stand-off distances
- Outstanding measurement depth-of-field compensates varying distances
- Visible laser for easy alignment
- Superior laser safety due to functional redundant laser switch-off
- Compact design for simple integration

**Polytec LSV Laser Surface Velocimeters are established optical sensors for precise in-process monitoring of length and speed within production of continuous material or piece goods.**

They offer flexible process integration, are convenient to set up and yet are extremely reliable in operation. It doesn't matter whether you're producing coils, pipes or profiles with shiny, matt or transparent surface – a Polytec LSV copes with any task, measures contact-free and from a safe distance.

The latest generation of ProSpeed® LSV sensors with compact design and all-in-one integrated optics and electronics plus its enhanced connectivity allow an easy integration into production lines. With comprehensive accessories and the support of our PolyXperts, there is a customized sensor solution for every production line, matching your specific needs.

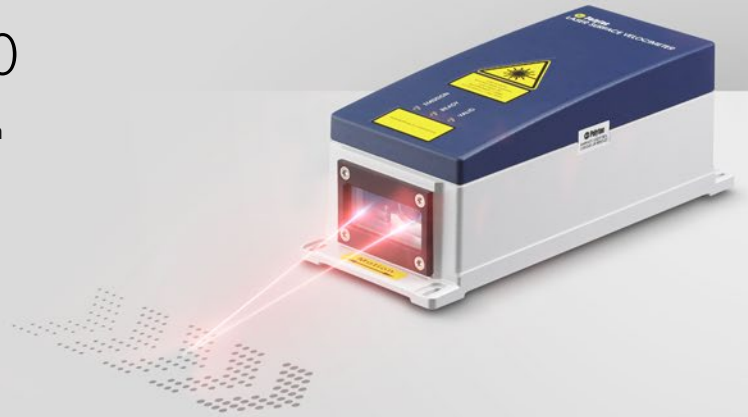
Just contact us! [oms@polytec.de](mailto:oms@polytec.de)

The enhanced connectivity of the ProSpeed® sensor generation ensures transparency in process control – anywhere and anytime. Web interface, multi-user access, Ethernet, fieldbus protocols, classic serial interface and a multitude of accessories offer flexible and customized solutions.



## ProSpeed® LSV-1100

The ProSpeed® LSV-1100 as cost-efficient entry system measures length and speed in forward direction with laser precision.



## ProSpeed® LSV-2100

The ProSpeed® LSV-2100 offers extended capabilities: It measures standstill conditions and also detects the direction of motion. Choose from different models with extended working distances of up to 3 m and even greater depth of field.



## PolyXpert Service

**With more than 50 years of experience in optical measurement technology, Polytec has become the leader in non-contact, laser based speed & length sensors. We build rugged, precise and reliable sensors that allow industrial customers to measure with confidence.**

With the LSV made in Germany, you choose far more than reliability and performance. With the LSV you choose Polytec and the support that nearly 500 employees worldwide bring to our customers. Whether it be understanding the application, applying the technology, installation, integration and training, repair/exchange services and much more, Polytec is available to support you through our world-wide network of representatives.

# Application-specific accessories

Polytec offers a range of accessories to make integration easy and operation reliable for demanding process environments, including those with dust, oil or high temperatures.



## Connection box

The connection box is completely wired for instant operation and contains a full terminal block, a universal power supply and a LAN connector.



## Compact terminal box

The compact terminal box for moderate environmental requirements provides the common interfaces for the majority of applications.



## Touch display

The 7" touch display simplifies parametrization and visualization of measurement values on site. It uses the same intuitive user interface, as known from operating the measurement system via laptops, smartphones and tablet PC. This way users feel at home, no matter the device they use to operate the ProSpeed® LSV-2100.



## Air wipe with exchangeable window

This front-mounted, aerodynamically optimized air wipe unit keeps the exchangeable window free of dust and steam. For cleaning or replacement, the window can easily be exchanged.



## Mounting platform

The 3-axis adjustable mounting platform simplifies the precise alignment of the LSV sensor in relation to the measurement object. When mounting the LSV in a cooling housing, a suitable mounting platform is available.



## Cooling plate

The cooling plate assures the sensor to stay in its operational temperature range, even under hot ambient conditions of up to +74°C.



## Thermo-protective housing TPH

In hot and harsh environments the LSV sensor receives additional protection by the special thermo-protective housing (TPH). This robust cast aluminum housing with integrated stainless steel cooling coils expands the operation temperature range up to -20 ... 200°C. The coolant can either be water, rolling coolant, paraffin oil or kerosene. An optional heat shield protects the system from heat radiation.



## Air amplifier

The air amplifier is used for purging the beam path of the LSV in steamy or dusty environments. It provides a stronger and more concentrated air current than any air purge unit and considerably reduces the consumption of compressed air in comparison with conventional devices.



## Further accessories

87°/90° beam deflection unit, measurement frame installation kit, beam protective sleeve, cable protection, air preparation unit.

# One solution – many applications

LSVs are utilized in all industries including, building materials, converting, paper, textile, carpet, extrusion, wire and cable, metals and many more.



**1** Cut-to-length control for paper and cardboard

**2** Manufacturing process of gypsum boards optimized with Laser precision

**3** Applications in the plastics industry benefit from laser-based measurement

**4** Reliable measurement without contact even on red-hot steel

**5** Length and speed measurement for reliable process control in a rolling mill

**6** Position detection in non-destructive testing on steel pipes



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