



## LSV Laser Surface Velocimeter

Non-contact speed and length measurement

Product brochure

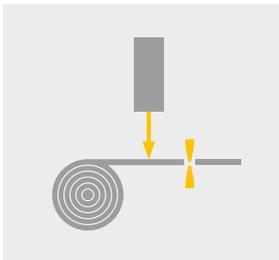


# Your measurement task – our solution

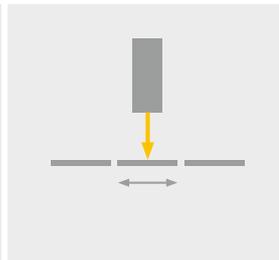
## Yield, quality, throughput – Keep your process under control

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.

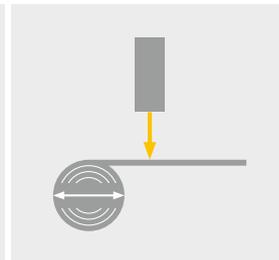
Thanks to the optical measurement the sensor captures length and speed reliably and without contact in challenging industrial environments. LSV offer a high level of robustness and process integrity at minimal maintenance cost.



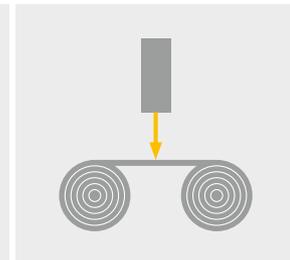
**Cut-to-length control**



**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 introduced 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.

## 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
- No recalibration needed

## PolyXpert Service & Support

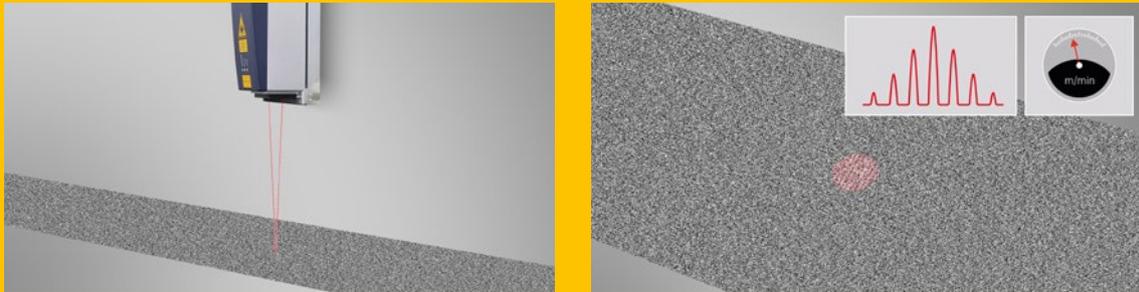
**With 50 years of experience in optical measurement technology, Polytec has become the leader in non-contact, laser based speed & length sensors. We build rugged, precise and reliable sensors that allow industrial customers to measure with confidence.**

With the LSV made in Germany, you choose far more than reliability and performance. With the LSV you choose Polytec and the support that more than 400 employees 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.



# The laser-based encoder

## 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.

Polytec LSV Laser Surface Velocimeters enable you to precisely monitor length and speed of continuous material or piece goods. They offer flexible process integration, are convenient to set up and yet are extremely easy to use and dependable in operation. It doesn't matter whether you're producing belts, pipes or profiles with a shiny or a matt surface – a Polytec LSV copes with any task and measures goods' surface velocity and cut lengths with zero contact and from a safe distance.

The LSV-1000 with its compact design and all-in-one integrated optics and electronics is integrated with ease. The LSV-2000 actively measures velocity to standstill, as well as detects the direction of motion (forward/reverse). Select the MID models, LSV-1000 MID or LSV-2000 MID for processes where goods are sold by length in accordance to the Measurement Instruments Directive 2014/32/EU (MID). The latest sensor generation – ProSpeed™ LSV-2100 ensures transparency with an enhanced connectivity concept and up to 3 m long stand-off distances.

## 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
- Visible Laser for easy alignment
- Superior laser safety due to functional redundant laser switch-off
- Compact design for simple integration

## LSV-1000/-2000

The compact design of the LSV-1000 and LSV-2000 enables an easy integration into the production line. Choose the LSV-2000 for determining also the direction of motion as well as standstill conditions and benefit from its unrivaled depth of field independent from the stand-off distance.



## LSV MID

Select the LSV MID series for calibrated machines when producing strip material according to the Measurement Instruments Directive 2014/32/EU (MID). LSV MID offers a high level of data security, transparency and process reliability at all times.

The LSV MID consist of an LSV sensor head and a separate controller allowing the easy operation via touch pad or web interface and the integration into the company network.



## ProSpeed™ LSV-2100

The enhanced connectivity of the next generation sensor ProSpeed™ LSV-2100 ensures transparency – anywhere and anytime. Increase your flexibility and get direct feedback through touch display. Comfortably parametrize via web interface and allow concurrent data access through Ethernet and serial interface for up to four users or systems. The optical sensor determines the direction of motion and standstill conditions, with extended stand-off distances of up to 3 m, adding flexibility for measurements under harsh conditions. For additional protection, choose the ProSpeed™ LSV-2100 with a rugged thermo-protective housing.



# 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.



## 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.



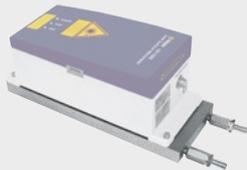
## Air wipe with exchangeable window

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 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 ProSpeed™ LSV-2100 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

Measurement frame installation kit, 87°/90° beam deflection unit, 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

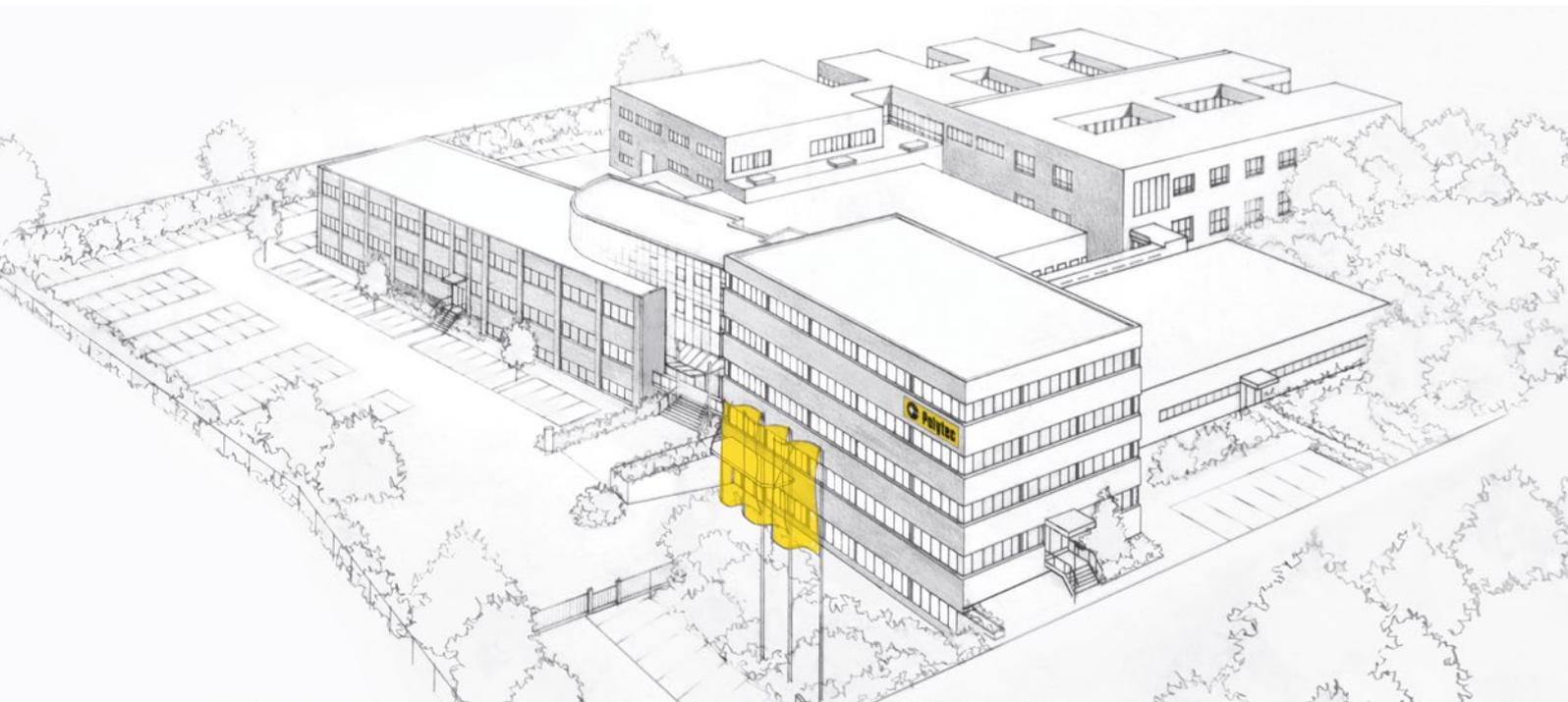
**2** Manufacturing process of gypsum boards optimized with Laser precision

**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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