

A PLUS FOR THE PROCESS THANKS TO PRECISION

Exact web edge control with light section sensors

During the continuous production of raw particle board in a plant of the Pflaierer Group, the position of a conveyor belt must sometimes be regulated, e.g. at a product change. Although the conveyor belt has a web edge sensor with mechanical contacts, this regulation cannot provide exact values for controlling a wide variety of strip positions. However, this task could be solved with a light section sensor from ipf electronic.

“Our company in Gütersloh is one of five production sites of the Pflaierer Group in Germany and has two plants here. Raw chipboards are manufactured in our factory and then further refined by coating in the adjacent production facility. The finished boards are destined for the timber trade and the furniture industry for further processing, for example for kitchen and bathroom equipment as well as living

room or office equipment, just to name a few examples,” explains René Kröger, Head of Electrical Engineering at Pflaierer Gütersloh GmbH.

Three turns one

A raw chipboard basically consists of three layers, two fine top layers and a larger middle layer. These plates are scattered in a so-called forming station with a circulating conveyor belt. First, glued wood chips with different grains are successively loosely sprinkled onto a belt with UF resins and then compacted to allow the air to escape between the material. Subsequently, the layers of this initially endlessly long and 2.10 meter wide plate are pressed in a 43 meter long continuously operating press under high temperatures of about 240 degrees Celsius and high pressure to the raw chipboard. Thereafter, the cut into smaller plates is made..



René Kröger gives an impression of the dimensions of the approximately 43 meter long roller press. The particular position of the production line can be used to set how the so-called chipboard cake enters the press. The strip position thus crucially influences the smooth production process.

Visual check of the strip position

“The position of the production line can be used to set how the so-called chipboard core enters the press line. The position of the belt thus crucially influences the running behavior of the press and thus the smooth production process,” explains Kröger. To control the strip position, a web edge sensor with four mechanical contacts is used, which holds the web edge in position by means of a tape pliers.

“The web edge sensor basically only allows a two-point control. Nevertheless, it is occasionally necessary for a machine operator to intervene manually via the system control to correct the strip position. This is sometimes necessary especially during a product change during production. After all, we manufacture raw particle boards in various thicknesses from 8 to 38mm, whereby, depending on the board, the running behavior of the press also changes,” reports Kröger. In addition, it is produced around the clock in a 3-shift operation. If an em-

ployee starts his shift, he may not necessarily know what settings the previous shift made on the production line. Against this background, according to statements by René Kröger, the experiences of the respective machine operators were needed until now, as any corrections to the strip position were made via a visual inspection. “Of course, it would be far more effective if an operator can determine whether the current setting is really optimal based on concurrent tape readings.”

Sensors with versatile application potentials

During a trade fair, René Kröger drew attention to the light section sensors of the **PY74** series as a novelty at the ipf electronic stand: “When I had a closer look at the functionality and potential fields of application of these devices, it immediately occurred to me that these sensors are ideal for the exact regulation of the strip position in front of the press.”

The non-contact laser sensors (laser

class 1 and 2), which consist of four identically constructed solutions, don't have without reason the attribute “multifunctional”. Thus, the sensors are able to determine, independently of the distance, the position of object edges, the height of objects and the distance even from demanding surfaces, whereby one device type was especially developed for the measurement of round objects.

The devices of the **PY74** series have properties that were previously only known from complex laser measuring systems and yet are as easy to operate as diffuse-reflection laser sensors. This is possible i.a. through the functional principle of the laser sensors - the light-section method.

Exact illustration in high quality

For this, the devices project a precise laser line onto an object that is reflected by its surface (see graphic). The reflected laser light is triangulated on a two-dimensional optical receiver with a special multi-lens system that allows accurate imaging in high optical quality.

Due to an integrated intelligent algorithm in combination with a powerful coordinate transformation, the devices finally calculate the respective output values, based on up to 600 measured values.



The laser sensors of the PY74 series are based on the light-section method.

An intelligent algorithm paired with powerful coordinate transformation allows i.a. measurements without complex sensor alignment



The light section sensor was installed parallel to the existing web edge sensor on the conveyor belt in front of the press.

With reference value and tolerances to the target

Pfleiderer Gütersloh received a test device, more precisely the PY740020, to first try the sensor in the concrete application on the press. The light section sensor with an operating distance of 100mm to 150mm was installed parallel to the existing web edge sensor at an angle of about 80° to the web edge on the conveyor belt in front of the press and then a zero point of the tape as a reference in the device was taught. "Then we set the permissible changes up and down according to our specifications for the respective web edge course," says Kröger.

Unique values increase process reliability

According to the functional principle described, the maximum 70mm wide laser line of the sensor continuously detects the web edge, whereby the device transmits via its analog output (0V ... 10V / 4mA ... 20mA) the current measured values to the PLC of the press.



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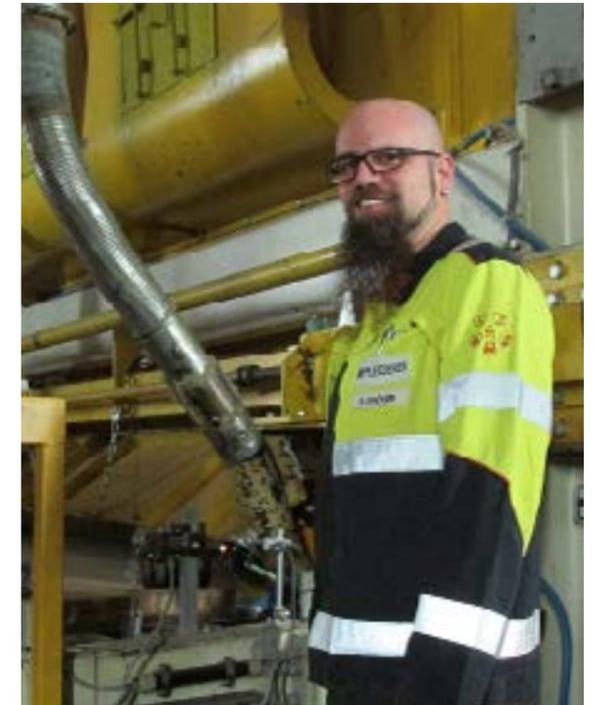
The in-depth tests with the PY740020 were successful, so René Kröger's conclusion on the light-section sensor is positive: "A machine operator can now see immediately from the values processed by the PLC, whether the tape runs for the current production at the specified tolerance range or whether he must correct the position of the web edge if necessary. The process reliability of our production has improved significantly. Another advantage: As wood chips are naturally produced during the production of raw particle boards, the functional principle of the devices is very helpful. The sensor operating as a light sensor without a reflector works extremely reliably. The optics of the device we clean only in an interval of several weeks."

Automated web edge control

The characteristics and in particular potentials of the light-section sensor from ipf electronic have clearly convinced the head of electrical engineering maintenance, as in the future it is planned to automate an optimized web edge control in the raw chipboard production with the help of the PY740020. "In addition, it is conceivable to use light-section sensors after cutting to check chipboard edges for automated quality assurance for defects," says René Kröger.

Leader in Europe

The Pfleiderer Group is a leading wood-based material manufacturer in Europe with annual sales of approx. EUR 1 billion and around 3,500 employees. The company is headquartered in Wrocław (Poland) and in Neumarkt i.d. Upper Palatinate (Germany) and has a total of nine production sites in both countries as well as sales offices in England, the Netherlands, Switzerland, Romania and France. The Pfleiderer Group offers a complete range of products and services with a focus on furniture construction, timber trade, interior design and constructive timber construction. The group is called Pfleiderer Group S.A. and listed on the Warsaw stock exchange.



René Kröger, Head of Maintenance Electrical Engineering, Pfleiderer Gütersloh GmbH: „The process reliability of our production has been significantly improved by the use of the light section sensor.“