

## WHAT IF IT GETS VERY SPECIAL?

### **OBJECT DETECTION OVER LONG DISTANCES, EVEN UNDER THE MOST ADVERSE CONDITIONS.**

High-performance light barriers can outperform conventional systems for object detection in harsh environments. This is especially true when it comes to demanding presence control of workpieces over long distances, as in the following application. After a furnace run, flat, large-area plastic parts for the automotive industry are transferred to a downstream transport process via a rod mesh conveyor belt. This requires a reliable presence check of the workpieces on the conveyor belt. This is not an everyday task, because several factors, such as the higher ambient temperatures in the area of the conveyor belt due to the still very warm plastic parts (up to approx. +80 °C) as well as process-related dust generation, do not make reliable detection easy.

#### **SPECIAL FEATURES MAKE INSPECTION DIFFICULT**

In addition, there are other crucial challenges for potential solutions. For example, the large and flat workpieces cannot be easily differentiated from the rod mesh of the belt, especially since the plastic parts do not have a predefined transport position, moreover their surfaces are different and they have to be detected from a greater distance.

#### **CONVENTIONAL SYSTEMS FAIL**

The systems initially preferred by the automotive supplier, a standard retro-reflective sensor and a laser diffuse-reflection sensor, did not achieve the desired goal of process-reliable presence monitoring of the plastic parts on the rod mesh conveyor belt. As is well known, a reflector or triple mirror is required as a counter element for the retro-reflective sensor. This was initially mounted above the conveyor belt in order to be able to work virtually through the belt.

Incoming plastic parts were then to interrupt the light beam between the triple mirror and the reflex light barrier. However, this first approach failed because the optical performance of the system was too low, so that the bars of the belt repeatedly caused faulty switching. An attempt to use a laser diffuse-reflection sensor, in which the tape was treated as background, also failed. Due to the special properties of the workpieces described above, the system was unable to ensure reliable background suppression and thus reliable presence monitoring of the plastic parts.

#### **HIGH-PERFORMANCE WITH ENORMOUS PENETRATION**

A high-performance light barrier from ipf electronic was able to solve the problems. These proven light barriers, which have been continuously developed over the years, are particularly recommended when reliable object detection is required over long distances despite the most adverse environmental conditions. Due to the high performance of the systems with their enormous penetration, e.g. chips, dust, flour, oil, dirty water or steam, for example in cleaning processes, are no obstacle.

#### **FAR-REACHING AND INSENSITIVE**

ipf electronic's high-performance light barriers basically consist of an amplifier for DIN rail mounting as well as a transmitter and receiver. Due to their large opening angle of up to 20° for the transmitters and 25° for the receivers, they can be easily aligned to each other, even at ranges of up to 60 meters. Furthermore, this makes the systems insensitive to vibrations or shocks and any resulting misalignment.

The light barriers connected to the processor-controlled amplifier operate with modulated infrared light, which makes them highly insensitive to extraneous light. Due to the good penetration of the infrared radiation, a high insensitivity to contamination is also guaranteed. In the case of extreme contamination, the screw-on air purge nozzles available as accessories can also be used. Optional fiber optic attachments also allow the solutions to be used in Ex environments or at ambient temperatures of up to +300°C. In addition to 1-channel amplifiers for a light barrier system, ipf electronic also offers devices for the direct connection of 2, 4 or 8 light barriers, which are then operated in multiplex mode to avoid mutual interference between transmitting and receiving units installed close to each other.

**SAFE VIEW THROUGH THE ROD MESH**

In the specific application at the automotive supplier, a high-performance transmitter-receiver system based on infrared was installed, with the light path running directly through the rod mesh conveyor belt, which is in constant motion. In order to be able to safely penetrate the conveyor belt or to safely blank out the bars of the belt, the **OS126120** transmitter was used, which, due to its aperture angle of 6°, ensures bundling of the emitted light and thus maximum transmission power. The light output can be adjusted individually by the external amplifier **OV620810**.

Although the 25° aperture angle of the **OE126020** receiver ensures easy alignment, large transmitter/receiver distances or difficult-to-access installation locations, as in this application, pose a challenge for the exact adjustment of the systems. To facilitate this, the **OV620810** amplifier has an analog output that represents the degree of alignment via a 0-10V signal. In addition, an alarm output is available, which issues a warning message if the light barrier becomes too dirty or in the event of a device fault. Since high-performance light barriers from ipf electronic achieve very large ranges of up to 60 meters for presence monitoring, the system could be installed at the automotive supplier outside the conveyor belt as a thermally critical area.

**HIGH DEMANDS MET**

The high-performance light barriers from ipf electronic were installed at the automotive supplier in February 2014 and have since ensured consistently reliable detection of the plastic parts on the rod mesh conveyor belt. With the device of the sensor specialist from Altena, a solution was thus found for a demanding application in which other systems failed.



The rod mesh of the conveyor belt made it difficult to detect the workpieces. Neither a retro-reflective light barrier nor a laser diffuse-reflection sensor could achieve clear object detection. The high performance light barrier from ipf electronic solved the problem.



The transmitter unit of the high-performance light barrier. The selected aperture angles allow the transmitters and receivers to be easily aligned with each other, even at ranges of up to 60 meters.