# Leuze

# **Safety Solutions** Efficient material flow and complete safety

Safety at Leuze 

**The Sensor People** 

### **Safety Solutions**

Efficient material flow and complete safety

The increasing automation of processes places growing demands on safety concepts. Classic concepts such as muting are often pushed to their limits here, e.g. at transfer stations and material locks. Our innovative safety solutions guarantee gapless safety, efficient material flow and high availability of your system, even with automatic processes.



### Advantages for you

- Save time and money with our pre-developed safety solutions
- All safety solutions are CE-certified and compliant with standards. This gives you legal security.
- The intelligent and innovative safety concepts ensure smooth processes and seamless safety – even where classic concepts are pushed to their limits
- Each safety solution is individually adapted to your system layout
- Our teams of certified safety experts accompany you throughout the entire project

#### Use our experience

Innovative ideas are based on experience and know-how. For more than 30 years, we have been supporting safety-related applications in different industries by offering a broad range of products. Our safety experts have comprehensive knowledge of the latest norms and standards and extensive experience in designing safety concepts. This allows us to develop efficient safety solutions for use in automated environments.

- Global network of certified experts for the creation of safety concepts and the validation of the solutions on-site
- In-house Solutions Engineering Center
- Development and design according to the V-model in accordance with EN ISO 13849-1
- Extensive selection of in-house safety products



#### Complete solutions for your plants

Our solutions are based on qualified safety concepts, which can also be expanded or newly created if required. We take care of all the necessary process steps, from standards research to commissioning support. And in the project, each solution is individually adapted to your system layout.

#### **Concept and design**

The conception and design of the safety solutions is carried out entirely by our Solutions Engineering Center. This includes:

- Research of guidelines and standards
- Design of the safety concept and the system architecture
- Software development and validation
- Comprehensive documentation, including CE declaration of conformity



#### Hardware and software components

Our safety solutions include all necessary hardware and software components for integration into your system:

- Safety sensors
- Leuze safety program
- Compact control cabinet, as required

#### Services - Tailored to your project

Each safety solution is individually adapted to your system and supported by us within the project until the handover:

- Engineering services with configuration and parameterization according to project requirements
- Commissioning support
- Final acceptance



#### - Safety control

- Cabling

#### The path to your solution

#### Gather requirements

- Examine layout and danger zones, clarify processes
- Check risk assessment, define protective goals
- Clarify timing

#### Selection of the safety concept

- Evaluation of the requirements by our safety experts
- Selection of the appropriate safety concept and the required components



#### Safety inspection & acceptance

- Validation of the safety function
- Initial inspection of the safety devices
  Creation of the acceptance documentation

#### Installation & commissioning

- Provision of the mounting and installation instructions
- Mounting and installation of the system components
- Support during commissioning and the integration in the control

#### Configuration & parameterization

- Configuration of the safety system
- Programming and parameterization according
- to requirements
- Project-specific documentation

## Safety solutions – examples

### Efficient material flow and complete safety

# Access guarding on pallet magazines – with automatic restart

#### Requirement:

Access guarding of the pallet magazine should prevent the entry of persons and simultaneously permit the entry of pallets by a forklift truck. After the forklift truck has again left the transfer area, restart should occur automatically to minimize the interruption of the work process.



#### Solution:

The access area is safeguarded by a safety light curtain. In addition, induction loops are embedded in the fl oor in the areas in front of and behind the safety sensor. The safety system can thereby distinguish between forklift truck and persons.

#### Advantages for you

- Optimum system utilization through automatic restart of the machine without manual operator interventions
- High reliability and availability
- Low service costs
- Optimum protection against manipulation
- Simple integration in the safety circuit of the primary control

#### System components and safety parameters

- Safety sensor: MLC 500 safety light curtain, with device columns for floor mounting
- Induction-loop set with evaluation unit
- System control: MSI 400 safety control
- Leuze safety program
- PL d in accordance with ISO 13849-1, SILCL 2 in accordance with IEC 62061
- 2-channel safety output

#### Access monitoring at material transfer station

#### Requirement:

The robot cell is fed automatically. The material is loaded onto the conveyor line, e.g. using a forklift truck, and then transported into the cell. Access to the cell must be safeguarded. To guarantee optimum capacity utilization of the robot cell, the safety concept must also allow uninterrupted operation of the cell during loading.



#### Solution:

The loading area of the conveyor line is guarded at both the entry and exit side by multiple light beam safety devices. The area between the photoelectric sensors is monitored for the presence of persons by means of safety radar sensors.

#### Advantages for you

- Higher capacity utilization of the system through interruptionfree operation of the robot cell, even during loading
- Infeed of transported goods of any shape or size thanks to an optimized safety concept
- Safe and reliable even under demanding conditions, e.g. with partly loaded or empty pallets
- Supports automatic starting of the conveyor line to improve efficiency and safety
- No operator action required
- No visual monitoring of the danger zone necessary

#### System components and safety parameters

- Safety sensors: MLD 500 multiple light beam safety devices, LBK safety radar sensors with controller
- System control: MSI 400 safety control
- Leuze safety program
- PL e in acc. with EN ISO 13849-1,
- SILCL 3 in accordance with IEC 62061
- 2-channel safety output, 2 signalling outputs

#### Access guarding on multi-track transport systems

#### Requirement:

Pallets are output on individual tracks that are fed via a cross conveyor. The cross conveyor and the area located behind it are to be safeguarded against entry by persons. The protection should only release the track on which the pallet is output.



#### Solution:

Access guarding takes place via two vertically oriented safety laser scanners. From the system control, the safety system receives the information about the track onto which the pallet is output and adapts the protective field for the passage of the pallet accordingly. The entire process is monitored for safety.

#### Advantages for you

- Continuous monitoring of the entire transfer area for up to 10 tracks and width of up to 9 m
- Gapless safety during the transport cycles
- High reliability and availability
- Optimum protection against manipulation
- No additional trigger sensors necessary
- Easily retrofittable

#### System components and safety parameters

- Safety sensors: RSL 400 safety laser scanner
- System control: Leuze MSI 400
- Leuze safety program
- PL d in accordance with EN ISO 13849-1, SILCL 2 in accordance with IEC 62061
- 2-channel safety output

#### Access guarding with dynamic format adaptation

#### Requirement:

Pallets are automatically fed in and out by a conveyor belt. Access guarding should permit the transport of goods with changing width as well as with different positioning on the pallet and simultaneously prevent persons from running alongside.



#### Solution:

Access guarding takes place via two vertically oriented safety laser scanners. Measuring sensors determine the width and position of the goods and send this information to the Leuze safety system. This appropriately adapts the protective field for passage of the goods.

#### Advantages for you

- Continuous monitoring of the entire access area
- Gapless safety during the transport cycles
- High reliability and availability
- Low service costs
- Optimum protection against manipulation
- Easily retrofi ttable

#### System components and safety parameters

- Safety sensors: RSL 400 safety laser scanner
- Measuring sensors: ODS optical distance sensors
- System control: Siemens SIMATIC S7
- Leuze safety program
- PL d according to ISO 13849-1, SILCL 2 in accordance with IEC 62061
- 2-channel safety output

# Safety solutions – examples

### Efficient material flow and complete safety

#### Safeguarding of robot / AGV transfer stations

#### Requirement:

The danger zone of the robot and the working range of the transfer station should be safeguarded against entry by persons during the entire process. The vehicle should be able to enter and exit the work area fully automatically.



#### Solution:

The entire area of the transfer station is safeguarded with safety laser scanners. As the vehicle passes through, the protective field dynamically adapts to the position of the vehicle by blanking the outline of the AGV from the protective field.

#### Advantages for you

- Monitoring for the entry and presence of persons
- Gapless safety during the entire cycle
- No restrictions during part transfer, e.g., for parts that protrude at the front or side
- Autonomous system, simple safety integration

#### System components and safety parameters

- Safety sensors: RSL 400 safety laser scanner
- System controls: Siemens SIMATIC S7
- Leuze safety program
- PL d in accordance with EN ISO 13849-1, SILCL 2 in accordance with IEC 62061
- 2-channel safety output

#### Area guarding of linear transfer carriages

#### Requirement:

The side-tracking skate crosses the travel path at regular intervals. During the entire movement process, the relevant part of the travel path is to be safeguarded against the entry of persons. The side-tracking skate should, however, be able to pass through the monitored area fully automatically.



#### Solution:

The relevant part of the travel path is safeguarded by safety laser scanners. These use their protective fields to detect the entry and presence of persons. During the travel process, the contour of the skate is dynamically blanked out of the protective fields. The entire area thereby remains optimally protected at all times.

#### Advantages for you

- Monitoring for the entry and presence of persons
- Gapless safety during the entire process
- No restrictions during part transfer even parts that protrude are possible
- Autonomous system with simple integration in the safety circuit of the primary control

#### System components and safety parameters

- Safety sensors: RSL 400 safety laser scanner
- System control: Siemens SIMATIC S7
- Leuze safety program
- PL d according to ISO 13849-1,
- SILCL 2 in accordance with IEC 62061
- 2-channel safety output

#### Area guarding at transfer shuttles

#### **Requirement:**

The transportation path of the transfer shuttle is to be monitored for the presence of persons by using safety laser scanners. To ensure optimal use of the floor space available, the shuttle has to move up to close to the wall. For this purpose, the protective field of the safety laser scanner must gradually be reduced as the skate approaches the wall.



#### Solution:

An area guarding system with a safety laser scanner is installed on both direction of the shuttle. The autonomous system detects when the shuttle is approaching the adjacent wall, and automatically reduces the size of the protective field of the safety laser scanner.

#### Advantages for you

- Improvement of the safety concept across the entire travel range of the transfer shuttle without any reduction in shuttle system performance
- The autonomous safety systems can each be easily integrated into the shuttle system control via a two-channel safety output
- Easily retrofi ttable, minimal mechanical installation requirements
- Also for the operation of 2 shuttles in one aisle

#### System components and safety parameters

Area guarding system for one direction, consisting of

- Safety sensor: RSL 400 safety laser scanner
- System control: MSI 400 safety control
- Leuze safety program
- PL d in accordance with EN ISO 13849-1, SILCL 2 in accordance with IEC 62061
- 2-channel safety output

### Safety from experts Wide range of elements for optimum solutions

With curiosity and determination, we Sensor People from Leuze have been innovators for technological milestones in industrial automation for more than 50 years. Your success is our motivation. Yesterday. Today. Tomorrow. In the area of machine and system safety, we have convinced right from the start through trend-setting inventions, such as the development of the very first safety light barrier. Increasing process automation places growing demands on the design of safety concepts. Our intelligent safety solutions provide an answer here. Various components and services form the basis. The benefits for you: gapless safety, efficient material flow and maximum availability.

### Safety components



Safety laser scanners



Safety radar sensor

Safety PLCs

and relays



Safety light curtains / with Smart Process Gating



Safety switches



Safety command devices, signal lamps



Multiple light beam safety devices / with muting



Safety proximity sensors



Single light beam safety devices



Safety switches with guard lock

**Safety services** 



Safety concept Safety design









Stopping time measurement