

DOLD



Safety enjoys
highest priority

User Article :
SAFEMASTER STS, SAFEMASTER W

The production of clay roof tiles involves very rough ambient conditions. Accordingly, systems used in this environment must be highly robust. For this reason, the safety switch and key transfer system SAFEMASTER STS is applied in the material processing of Creaton to ensure the required work safety.

The roofing of pitched roofs with clay tiles is a very old technique that had already been common in ancient Rome more than 2,000 years ago. At that time, pipes were produced on a potter's wheel and subsequently separated into two parts, the so-called mission tiles. Today's extruded or pressed roofing tiles are industrially produced and the most commonly used outer skin of the roof of residential buildings in Central Europe. One of the market leaders for roof tiles fired from clay is Creaton, a company that can look back on a long history. In 1884, Alois Berchtold founded a brickyard in Wertingen and quickly gained a reputation as quality manufacturer of clay roofing tiles. After many mergers and takeovers the company Creaton, now belonging to the Etex group, produces about 20 million pressed roofing tiles per year at this location. After a catastrophic fire in May 2007 the complete plant was renovated and subsequently rebuilt in a modern way. Today, it is one of the most modern locations for clay roofing tiles in Europe.

Natural product for the roof

The production of roofing tiles is based on natural raw materials: Clay and loam are processed in a particular ratio and must not be too wet. "Our raw material comes from different company-owned pits in the surroundings", reports Ferdinand Kanefzky, plant manager for the locations Wertingen and Roggden. For the plant in Wertingen, 75,000 tons of raw material per year are delivered to the material processing. There, three different raw materials are transported by conveyor belts into an edge mill, ground by the extremely heavy rotors and pressed through grates. The raw material is not just crushed but also homogenously mixed here. The dosage ratio of the three materials from different pits is essential for the consistent quality of the end product. The edge mill is followed by two rolling mills in which the material is conveyed through a 1.2 mm resp. 0.7 mm wide gap and further crushed. Next, the finished material gets to the soaking house where it has to rest for about three weeks before being processed into roofing tiles in the production plant. "The water content is decisive for the product quality", F. Kanefzky points out: "It always has to be between 19.5% and 20%."



Safety fences protect from the dangerous plant components in material processing.



Creaton produces appr. 16 million roof tiles per year at its plant in Wertingen.

After resting in the soaking house for three weeks it is conveyed to the pressing plants where it is properly shaped in a fully automated process. After drying the tile blanks are then transported into the furnace. Coloured or glazed roof tiles are sprayed with the desired colour resp. glazing material before burning. At a furnace temperature of 1,500°C the colour merges with the top layer of the roofing tiles, allowing for the coloured roofs that have become so popular today.

Safeguarding of doors to the processing plants

About 50 employees, partially in two-shift operation, work in different production areas. Dryer and furnace are in operation around the clock for 365 days per year. In fully-automated operation one employee is always on duty and notified in case of a fault. "Of course, we always want to deliver the required production output", the plant manager emphasizes: "In doing so, the safety of the employees always has top priority." In particular in material processing the company has invested a lot into work safety in recent months. Among other things, the access to all parts of the plant was secured by fences. The hazards resulting from the fast conveyor belts, the extremely heavy rotors in the edge mill and the rollers were so effectively prevented. Several doors and gates are integrated for cleaning and maintenance works; some of them even provide access for a sweeper or a fork-lift truck. In most cases, the plant is operated by a single employee. This excludes the monitoring by a colleague for the purpose of increased safety. Thus, the access was safeguarded in such a way that the employee can only enter when the machine stands still.



The purely mechanical guard locks at the doors consist of stainless steel and are therefore extremely robust.



Wolfgang Schüle (Head of Maintenance) demonstrates the removal of the keys at the control room.

To realize the safety technology a system from Dold & Söhne was selected. The safety switch and key transfer system Safemaster STS combines the advantages of safety switch, guard lock, key transfer and command function and can be extended in a modular way. The key transfer system is connected to a safety-PLC in the control room of the material processing. If employees want to gain access to one of the doors, they first have to send a request via the user interface of the control. They can only take out the key, however, once the machine has come to a standstill. "Especially the big mill drives sometimes have a follow-up time of more than 30 seconds", F. Kanefzky explains. The employees can then open the respective door with the key. Once they have completed all tasks within the safety range they close the door again, take out the key and insert it into the central system at the control room. Only then the plant can be switched on again.

A protection against accidental locking in of the employee is integrated in SAFEMASTER STS. For this purpose, a LOTO-function (Log Out Tag Out) is provided. Upon entering the plant each employee places his or her personal padlock into the LOTO-module at the STS-system. This effectively prevents an accidental closing of the door and a potential start of the machine. "This is particularly important as the plant is complex and cannot be fully monitored from the control room", explains W. Schüle.

Robust system easy to install

One of the advantages of the SAFEMASTER STS is its high robustness, as the maintenance manager Wolfgang Schüle points out: "The components consist of stainless steel and are therefore very robust - an ideal solution for the rough ambient conditions in our material flow processing." Due to the starting material this area of the clay roof tile production is both dusty and humid. Under these difficult circumstances, less resistant components can hardly be used. The installation of the system and the connection to the safety-PLC was realized by the maintenance team on its own.

Particularly helpful was the fact that the electrotechnical connection must only be made at a single point. The door interlocks are purely mechanical. "This made the installation a lot easier for us", explains W. Schülein, "as no cables to the doors had to be laid."

Manual operation with enabling switch

However, the fences and the safeguarding of the doors and gates also have disadvantages, as W. Schülein reports: "In case of repairs and maintenance works at the plant the drives cannot be started. But this is sometimes necessary, e.g. to check if everything works properly." For such cases a wireless enabling switch from the SAFEMASTER W series was integrated into the safety concept. The system consists of a compact handheld transmitter and a radio-controlled safety switch device that is connected to the safety-PLC. The employee logs in via radio with the enabling switch and can then switch on individual drives. The integrated display shows which drive has been selected. This system is particularly safe as it combines a dead man's switch with a panic switch. If the employee releases the button the drive is switched off immediately. The same happens when he or she presses the button down completely. The possibility to define a starting zone via infrared ensures that only drives in the direct surroundings of the operator can be switched on by the radio system. "The total plant cannot be put into operation by the enabling switch", emphasizes W. Schülein, "only a single drive, e.g. a conveyor belt."



With the enabling switch of the SAFEMASTER W series the employee logs in via radio and can then switch on individual drives.

Consistently positive feedback

The installed system with door locking via the SAFEMASTER STS has meanwhile been approved by the responsible employer's liability insurance association [Berufsgenossenschaft]. "We discuss all safety measures in the plant in our work safety committee", F. Kanefzky explains. The latter consists of the trained safety officers, the works council, the shift leaders and members of the employer's liability insurance association. "When the safety installations for the material processing were planned, it was of particular importance to involve the employees that work at the plant day by day", the plant manager points out. Only if the employees are satisfied with the system they can perfectly work with it. If safety precautions are too cumbersome during the daily routines, this not only affects productivity, but the employees are more tempted to manipulate the systems. All in all, Creaton's experience with components and systems from Dold has been very positive. "They have made a major contribution to significantly improve the work safety in material processing", F. Kanefzky summarizes.