

zenon monitors Overall Equipment Effectiveness for the HeidelbergCement Group

# Increased efficiency in the palletizing process at Góraźdźe Cement

As one of Poland's largest manufacturers of cement, Góraźdźe Cement produces several million tons of cement per year. Shipping this quantity of product requires very efficient processes. Indeed, the palletizing and stretch hood machines in its packaging area form two very important stages of its production process. Monitoring the overall equipment effectiveness (OEE) on these processes is therefore of the utmost importance to the Góraźdźe Cement team and requires managerial supervision. To improve OEE here, Góraźdźe Cement implemented COPA-DATA's zenon software and has now seen its costs reduce as much as to 20%.

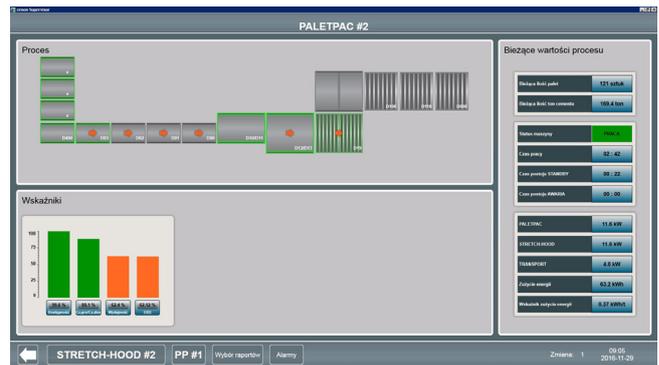


Góraźdźe Cement is part of the international HeidelbergCement Group, along with fellow Polish manufacturing sites Góraźdźe Beton and Góraźdźe Kruszywa. It is located in the Polish village of Chorula, near Opole, and has been in operation since 1977. The site has always been something of a trailblazer in technology solutions. As far back as the 1970s, when it was the

norm in the communist state for industrial technology to be purchased from the Soviet Union, the team at Góraźdźe Cement was sourcing technology from Western Europe in order to get its hands on the best technical solutions and ensure the most efficient operations.



Monitoring key parameters: process steps, alarms and current machine data.



OEE chart from the palletizing machine.

Over the years, Górażdże Cement’s many development and modernization investments in its high-end equipment and production machinery, including its four cement mills, have strengthened its position as one of the largest and most modern cement factories in Europe. The giant HeidelbergCement Group acquired the Górażdże Group in the mid-1990s and by 2015, the Górażdże Group employed about 1,200 staff and its consolidated turnover amounted to approximately 1,100 billion PLN.

### FROM IDEA TO REALIZATION

In 2015, Marcin Reinert, the Manager of the Electrical Department at the Górażdże factory, began to look at ways to improve the performance of the palletizing and stretch hood operations.

Marcin Reinert explains the situation: “The pallet pack and stretch hood machines broke down unexpectedly many times. In the demanding schedule of activities and production orders, it was hard to accurately analyze the causes of alarms or plan preventive measures which would reduce the number of interventions by external service companies, which can be really expensive. No statistics of alarms or failures were being collected, archived or analyzed. Although this information was reported in the manufacturing documentation, it was hard to create a report detailing the failure statistics.”

Marcin Reinert continues: “The challenge for me was to monitor the effectiveness of these devices. I often observed that during the manufacturing process these machines were idle. I asked myself ‘how much of the time are they actually being used? How much energy do they consume? And how does this relate to the costs incurred by the plant?’ I then realized that

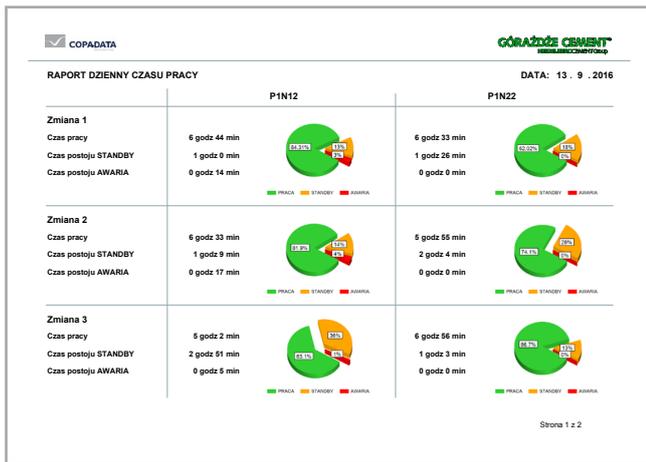
I needed a tool which would allow me to monitor the actual operation time of the equipment and thus the efficiency of its use; the OEE coefficient.”

Marcin Reinert and his team had been introduced to COPA-DATA’s zenon Analyzer during the evaluation process to find suitable software for this project. They had been very impressed with the analytical capabilities of the program right from the start. The team began to develop an idea about how to integrate zenon Analyzer into the existing production infrastructure. First, zenon Analyzer would need to process and analyze data from zenon projects which were already in place. Plus, it should enable further machines and devices to be connected so the whole production process could be supervised.

### SCOPING THE PROJECT – KEY OPTIMIZATION FACTORS

The first step towards achieving the goals set by the Górażdże team was to determine the structure and scope of the new zenon project. This included defining the individual tasks and assigning them to the right people, as well as sourcing all the necessary equipment and devices. Because zenon is so intuitive and easy to use, Marcin Reinert decided that the solution would be implemented by an in-house team of automation engineers from the Chorula plant.

The next step was to supply data retrieved from the palletizers to zenon by connecting them to the server. Because of the distance from the central control room to the palletizers, a fiber-optic cable connection was established.



Daily reports present the accurate duration of active operation for the palletizing machines.

The responsibility for carrying out the project fell to engineer Marek Haręcki, who began creating a zenon application to collect, archive and analyze data so that it could be presented in the form of clear reports. Once the connection was established, and data began to be collected and presented, these reports were shared with the shift managers and the director of production.

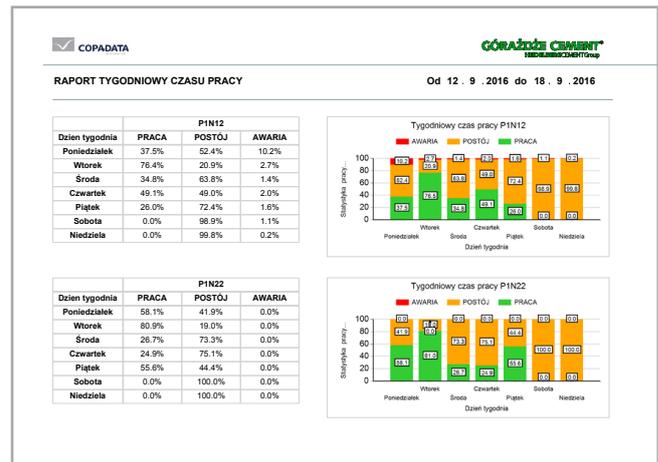
### AUTOMATED ENGINEERING FOR RAPID DEPLOYMENT

The scope of the zenon project included two BEUMER devices for palletizing bags of cement. These machines were equipped with programmable S7-300 controllers with digital input and output cards and the OP 27 operator panel for operation.

The project infrastructure was created on the server, and consists of a central processing unit, two client stations and an engineering station where zenon is installed with the Historian, Message Control and Report Viewer modules.

The newly created project was supplied with data collected directly from the S7-300 controller of the BEUMER palletizer. This concept was introduced by Marcin Reinert and then further developed by Marek Haręcki, who began the project by preparing the network infrastructure, selecting and implementing the communication processors and configuring the palletizer’s controller.

The next step was the creation of the computer network and the installation of zenon, as well as the creation of the cement palletizing process visualization and manual and automatic reports.



A weekly report shows working time, standby time, and stand-by time because of alarms.

“zenon’s transparent structure greatly facilitated our work,” says Marek Haręcki. “zenon enables us to easily navigate through all the variables, screens and other components. During the process of creating subsequent screens and functions, zenon’s automatic help system facilitated and accelerated the design process.”

### A 20% COST REDUCTION

Following the completion of the project, the team at Górażdże Cement report that their objectives have been 100% achieved. Currently, thanks to the zenon-based solution, the team at the Górażdże Cement factory can thoroughly analyze each and every situation using the alarm archives and event descriptions to determine the cause of alarms.

zenon is a smart solution that allows you to prepare instructions for operators which detail the steps to follow when a failure occurs. Instant access to technical documentation enables users to quickly define a problem and remedy the fault. In addition, the entire solution is intended to define preventive solutions, thereby eliminating costly equipment downtime and the costs associated with using external maintenance companies.

Another benefit has undoubtedly been the analysis of the palletizers and shrink wrapping machine operation, as well as the effectiveness of their use (the OEE coefficient).

This has clearly translated into the optimization of the palletizing process and consequently resulted in significant energy cost savings. After completion of the project, Marcin Reinert says: “zenon aroused my curiosity from the very beginning. Its operator capabilities and above all – the aspect

“ *zenon aroused my curiosity from the very beginning. Its operator capabilities and above all – the aspect I’m most interested in – its diagnostic and analytical capabilities exceeded my expectations.* ”

**MARCIN REINERT, GÓRAŹDŹE CEMENT S.A.,  
MANAGER OF THE ELECTRICAL DEPARTMENT**

I’m most interested in – its diagnostic and analytical capabilities exceeded my expectations. The software’s vast number of functions, its versatility, and the graphics convinced me to choose zenon. The excellent contact and support from COPA-DATA Poland representatives has also been noteworthy. A high degree of competence, openness, understanding of our needs, good advice about the selection of appropriate modules, and great customer care has given me confidence that I have made the right choice.”

The Góraźdze Group’s engineering team are continuing to develop their zenon project, and new modules and functionalities are being added. The success of this project is already inspiring ideas about how to use zenon for the further optimization of processes in the Góraźdze Cement factory.

Paweł Zajd, Director of Production at the plant in Chorula, sums up their experience: “We recommend COPA-DATA; their products are among the most advanced and innovative.”

#### **MAIN BENEFITS:**

- ▶ Rapid implementation of the project
- ▶ Full support from COPA-DATA during the implementation
- ▶ Clear and timely reports
- ▶ Analysis of OEE
- ▶ Comprehensive alarm management
- ▶ Impressive graphics
- ▶ Optimization of the palletizing and shrink wrapping process
- ▶ Reduction of machine downtime
- ▶ A 20% reduction in costs
- ▶ Ergonomics for the user