CASE STUDY

Energy Efficiency Solution for Aeration of Grain Storage Silos

COMPANY DATA

Name: COCARI Cooperative
Activity: Agribusiness
Location: Borrazópolis - PR

DESCRIPTION

The demand for grains in Brazil is increasing every day and WEG together with the Agro industrial Rezende company, are accompanying this process of evolution, being pioneers in innovating and developing an energy efficiency solution for the aeration of grain storage silos.

The solution was put into place at the COCARI Agricultural Cooperative in the north of the Paraná state, showing the full potential for energy savings, in addition to this improved quality of the product and functionality of the system.

METHODOLOGY

The solution consists of the application of the W22 Premium or WMagnet Motor activated by a frequency inverter connected to an EF-ENERGY aeration controller, and replacement of the thermometry system (sensors and cables) usually already present in the silos not being necessary. An illustration of the solution is shown below

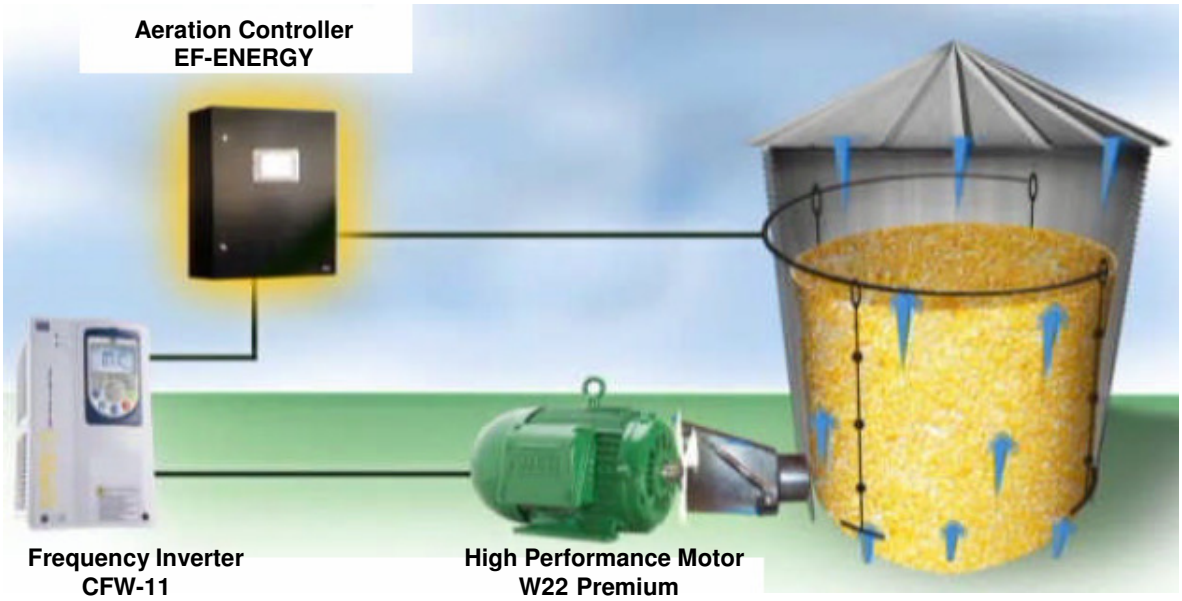


Fig. 1 - Illustration of the solution.

The Aeration Controller allows the selection of the type of product (grain) in the silo, identifies its temperature and level and sends the signal to the inverter to control the flow of the motor / ventilator. The precise ventilation required for the product is provided and thus gives the high savings obtained. The controller also analyzes the temperature and humidity of the of the environment in the definition of this ventilation.

APPLICATION OF THE SOLUTION

Silo no. 1 and Silo no. 2 were supplied with maize. The energy efficiency solution was applied just to Silo no. 2, maintaining the same level, aeration time, the power of the motors, the specification of the ventilators, and all characteristics in general, thus allowing a real comparison of the gains between the two silos.

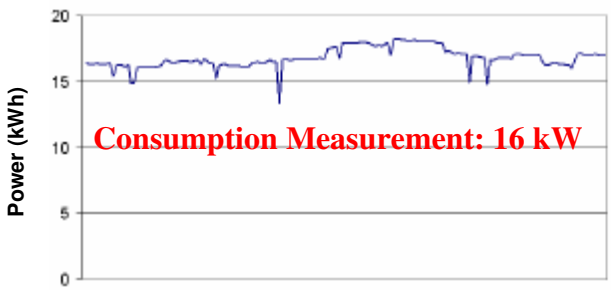
Technical Specification	Silo 1 – Without the solution	Silo 2 – With the solution W22 Premium Motor with Inverter + EF-ENERGY Aeration Controller
Power of the Motor (HP)	20	20
Rotation (RPM)	1770	1770
Activation	Star/Triangle	Frequency Inverter - CFW 11
Voltage (V)	380	380
Coupling	Direct	Direct
Product stored	Maize	Maize

Table 1 – Technical specification

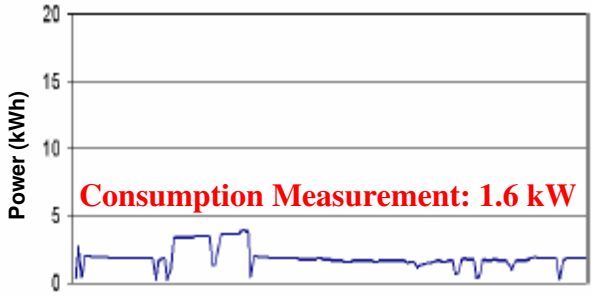
MEASUREMENTS

The measurements were made using the IMS energy analyzer for comparison of the consumption of electrical power between the two silos, as shown in the graphs below.

SILO No. 1 – WITHOUT THE SOLUTION



SILO No. 2 – WITH THE SOLUTION



Graph 1 – Measurement of the consumption of electrical power of Silo 1 and Silo 2

CONCLUSION

As proven by the measurements of the consumption of electrical, the application of the solution provided Silo No. 2 with a reduction of **90%** in the consumption of electrical, thus obtaining a return in **3 months** on the investment made. There are also gains such as:

- Reduction in energy demand;
- Rise in quality of the product;
- Precise control of temperature, humidity of the grains and level in the silo;
- Automation of the system.