

# D24 automatic dryer in storage system

## 1 THE CASE

An English farm located in Northwest England manages approximately **300 ha** of land growing **barley, rapeseed, wheat and oats**. In this area, when the cereals are harvested, they have a **humidity degree higher than 20-25%**.

The farm is planning on installing a new drying and storage system which meets the following objectives:

- **reduce the costs** of managing products after harvesting, at the same time improving their quality
- **increasing productivity** and thereby profitability
- **help the farm potential grow** by equipping it with systems and machinery which are the distinctive trait of a Farm conducted with a Business mentality.

The customer does not apply particular restrictions regarding the space available and the use of the electric power. For economical purposes and special focus on the environment, the customer requests using liquid propane gas (LPG) as fuel.



## 2 Automatic drying process

Keeping in mind that a drying cycle is completed when the 4 following phases are carried out: loading, drying, cooling and unloading, the MECMAR dryer in the **SAS (Standard Automatic System) 4 Electric Motor** version **automatically manages the individual phases** thus reducing the intervention of personnel, unlike the PTO and Dual Drive models where the controls must be operated manually.

The MECMAR dryer equipped with the SAS system **is provided with a series of sensors and logics** which, once calibrated according to the type of grain to be processed, make it possible to **autonomously carry out** one or more drying cycles in sequence.

The user only needs to make sure that the amount of fuel and cereal are appropriate before starting the cycle, as well as the essential task of monitoring the entire process.

If the control system is equipped with a system for **sending SMS**, the dryer is also capable of sending notification messages regarding the phases of the cycle or to warn in case of an alarm.

The following table compares the different phases between an SAS system with 4 electric motors and a PTO system. Bear in mind that a dryer equipped with an SAS system can also be run manually.

DRYING PHASES	SAS DRYER	STANDARD PTO DRYER
LOADING	<b>AUTOMATIC</b> with filling sensors	<b>MANUAL</b> with manual levers
DRYING	<b>AUTOMATIC</b> based on the end of the loading process	<b>MANUAL</b> with manual levers + electric panel
COOLING	<b>AUTOMATIC</b> based on the temperatures detected	<b>AUTOMATIC</b> start-up based on the detection of the cereal temperature, manual stop by means of <b>MANUAL</b> levers
UNLOADING	<b>AUTOMATIC</b> via electric actuators and emptying sensors	<b>MANUAL</b> by lifting a manual lever.

By incorporating the dryer into a made to measure storage system, all of the phases, from harvesting to storing the grain in the silo, can be managed in an automatic, optimised way, considerably reducing time and therefore management costs of the same processes currently carried out by workers.

Considering harvesting and drying are usually carried out in an often humid season, it is fitting to remember that the longer the time required to dry the harvested cereal, the lower the quality of the stored product, along with its commercial and nutritional value.

### 3 THE SOLUTION ADOPTED

After careful evaluation, the customer chose to develop a system centred around the MECMAR D24/175T2 dryer, supplied with:

- **a collection pit** where the trailers empty the crops to be dried, thus allowing threshing to go ahead at full speed
- **two 200-ton silos**, each with a conveyor at the base where the cereal is brought from the collection pit
- **two elevators**, one near the silo and the other near the dryer, to handle the grain

It is loaded automatically by transferring it directly from the silo to the dryer.

In the same way at the end of each drying cycle, the cereal is unloaded automatically from the dryer to the barn

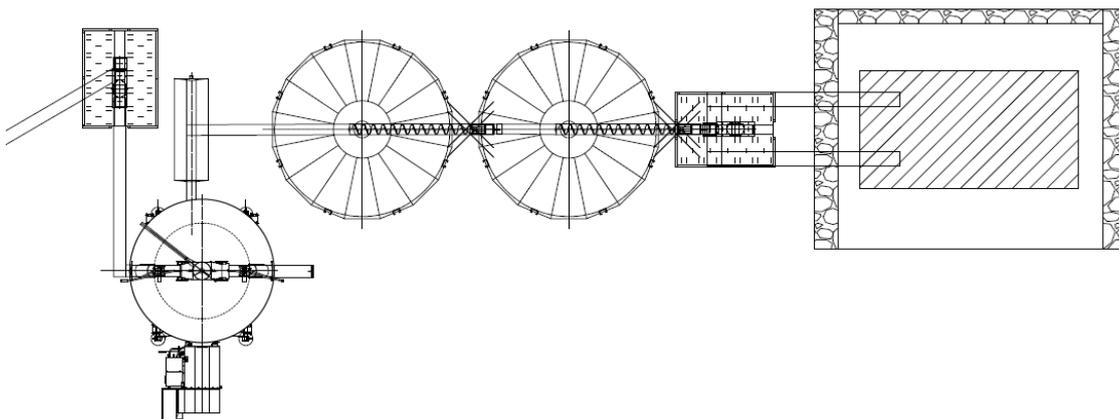


Figure 1 - System layout (from right): loading pit, loading elevator, 2 silos x 200 tons, dryer mod. D24, discharge elevator

The choice of the Mecmar D24/175T2 dryer is mainly featured by:

- **Sturdy design**, capable of drying extremely moist products
- **Air vein burner** capable of using **LPG in the liquid state**, without needing to apply additional equipment (e.g. vaporisers) between the burner and the LPG tank
- **Simple integration** of the dryer in an automatic system optimising time and operating costs
- **Efficiency**

Considering a daily production of approximately 125-145 tons/24h (from 25% to 15%) of dried and cooled wheat for this model, the dryer can easily work 24 hours a day and the fresh crops will remain in the loading silos for an average of one day.



Figure 2 – D24 dryer with 4 electric motors, SAS, with LPG-fired air vein burner.

Another big advantage that the customer appreciates is the fact that this **project is quickly installed**, and later on the D24 model can easily be replaced with another larger MECMAR dryer without needing to modify the current system.