SILOS CORDOBA

Corn storage in a metal silo

Recommendations for the storage of corn in a metal silo

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RECOMMENDATIONS FOR THE STORAGE OF CORN IN A METAL SILO

What are the necessary control plans for storing corn in a metal silo?

In this article we are going to explain the control plans that are required for the proper storage of corn in a metal silo, a common question many of our clients have.

Since cereal grains are hygroscopic, they usually develop a relationship with the moisture around themselves to achieve a balance with the air atmosphere. Depending on environmental conditions either the grain takes the humidity from the environment or the grain transfers its own moisture to the exterior.

The worst effect can be grain humidification, which can lead to fermentation (anaerobic oxidation), which increases the temperature and damages grains, allowing the proliferation of insects.

The grain is a “living being” and therefore breathes naturally and should have the optimal conditions of humidity and temperature.

Therefore, control plans for grain storage in metal silos are:

- Temperature control system
- Dimensioning adequate ventilation with centrifugal fans.
- Cooling system, ie, cold air ventilation (if necessary).

For corn in particular, optimal conditions for long storage periods are:

- 13% humidity
- Temperature of 15° C

The table below indicates the theoretical days of storage without deterioration of the corn kernel:

	Humidity (%)		
Temperature (°C)	**13**	**14**	**15**
20	100	41	20
25	59	24	12
30	35	15	7
35	21	9	4

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Corn storage plants by Silos Córdoba worldwide:

2002 | Asoportuguesa Venezuela

Plant conceived for the storage, cleaning and drying of maize and sorghum. The total capacity of the plant is 80.700 m³ for the storage of 60.500 T of cereal. The project includes:

- √ 12 silos model 19.10/18 with a total capacity of 76.800 m³.
- √ 10 hopper silos model 5.34/14 45° with a total capacity of 3.900 m³.
- √ Loading and unloadin is done at 200 T/h.
- √ The full automation for the complete process of the plant has been executed.
- √ Grain temperature monitoring system.
- √ Drying system in two lines with a capacity of 200 T/h (100 T/h each line).

2002 | Anca Venezuela

Plant conceived for the storage, cleaning and drying of maize and sorghum. The total capacity of the plant is 111.172 m³ for the storage of 83.500 T of cereal. The project includes:

- √ 16 silos mod. 19.10/18 with a total capacity of 102.400 m³.
- √ 10 hopper silos mod. 5.35/14 45° with a total capacity of 8.772 m³.
- √ The company has carried out the complete automation of the plant.
- √ Filling up and emptying is done at 200 T/h.
- √ This facility has a grain temperature monitoring system as well as two 100 T lines for precleaning and drying.

2005 | Piensos Daruz Spain

Plant conceived for the storage of corn for animal consumption. The total capacity of the plant is 2.500 m³ for the storage of 1.900 T of cereals. The project includes:

- √ 10 60° conic hopper silos that gives a total capacity of 2.500 m³.
- √ It includes also the filling up and emptying of cereal storage premises by belt and tripper.
- √ The second project is made up of hoppers for railway receipt at 100 T/h with two truck loading silos of 60 m³ capacity each.

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2005 | Pilones Curpa Venezuela

Plant conceived for the storage of corn.
The total capacity of the plant is 4.232 m³ for the storage of 3.200 T of cereal. The project includes:

- √ 2 silos model 14.51/10 of 2.116 m³ capacity each.

2006 | Agrícola Sumaya Chile

Plant conceived for the receipt, drying, precleaning and storage of wheat and maize. The total capacity of the plant is 18.500 m³ for the storage of 13.875 T of cereal. The project includes:

- √ 6 silos model 15.28/13 of 2.987 m³ capacity each.
- √ 2 hopper silos of 200 T.
- √ It includes a ventilation and temperature monitoring system.

2009 | Constanza Romania

Plant conceived for the storage of wheat, barley, rape, corn, sunflower...
The total capacity of the plant is 218.960 m³ for the storage of 164.000 T of cereal. The project includes:

- √ 17 silos model 24.45/22 of 12.880 m³ capacity each.
- √ Filling up is done at 1.200 T/h.

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2011 | Cefusa Spain

Project conceived for the storage of corn and barley.
The total capacity of the plant is 82.340 m³ for the storage of 61.750 T of cereal. The project includes:

- √5 silos model 27.50/22 of 16.468 m³ capacity each.

2012 | Zoubida Morocco

Project conceived for the storage of corn.
The total capacity of the plant is 26.216 m³ for the storage of 20.000 T of cereal. The project includes:

- √4 silos model 22.92/12 of 6.554 m³ capacity each.
- √Filling up is done at 200 T/h and unloading at 100 T/h.
- √The conveying machinery has been delivered by Silos Cordoba.

2013 | KST Sri Lanka

Project conceived for the storage of corn.
The tota capacity of the plant is 15.354 m³ for the storage of 11.515 T of cereal. The project includes:

- √2 silos model 22.92/13 of 7.025 m³ capacity each.
- √2 hopper silos model 6.88/13 45° of 618 m³ capacity each.
- √1 hopper silo for truck loading 3.50/5 45°.
- √Loading and unloading is done at 80 T/h.
- √The conveying machinery has been delivered by Silos Cordoba.

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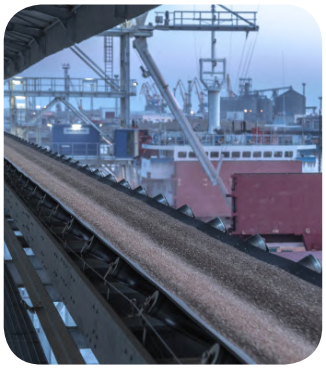
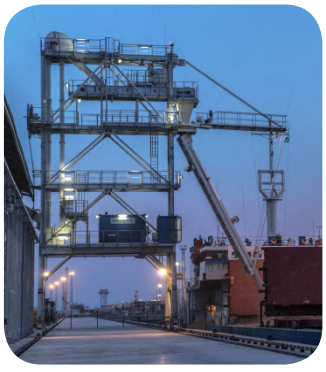
2013 | Adunati Romania

Plant focused on the storage of wheat, corn, rape and sunflower.
The total capacity of the plant is 8.046 m³ for the storage of 6.000 T of cereals. The project includes:

- √ 6 silos model 12.22/9 of 1.341 m³ capacity each.
- √ Dryer for maize model SCM 2-6 with a total capacity of 5 MT per hour able to reduce moisture content from 24% to 14%. Furnace use biomass.





2015 | AKT Kazakhstan

Plant focused on the storage of maize at Aktau Port. This plant is conceived for the storage and expedition at bulk carriers. The collection of maize on this plant is done through train. The total capacity of the plant is 82.560 m3 for the storage of 62.000 T of cereal.
The project includes:

- √ 6 flat silos model 27.50/18 of 13.760 m³ capacity each.

The storage plant can be divide into three main areas of work:

- √ Reception of cereals at 500 T/h.
- √ Storage of cereals.
- √ Dispatch of cereal from silos to ship at 500 T/h through a ship loader.

The facility has as well:

- √ Dust aspiration system in intake pit and handling equipment.
- √ Pre-cleaner system.
- √ Electrical pannel with PLC and SCADA.
- √ Lightning system.
- √ Fire extinguishing systems.
- √ Water drainage.
- √ Weighting system using a continuous flow scale of 500 T/h.

Erection and commissioning has been done by Silos Cordoba Kazakhstan.

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Under construction | NKF Iran

Plant conceived for the storage of soya bean, corn and wheat.
The total capacity of the plant is 489.792 m³ for the storage of 367.000 T of cereal. The project includes:

- √ 48 silos model 24.45/17 of 10.204 m³ capacity each.
- √ Intake conveying capacity: 1.200 T/h (600 T/h double).
- √ Discharge capacity: 800 T/h (400 T/h double).

2016 | Indeika Russia

Plant conceived for the storage of maize and wheat to provide the feed factory located at Tambov Region, Russia. The total capacity of the plant is 111.924 m³ for the storage of 80.000 T of cereals.
The project includes:

- √ 6 silos model 32.08/16 of 17.237 m³ capacity each.
- √ 4 silos model 9.17/12 45° of 1063 m³ capacity each.
- √ 10 silos model 6.88/08 60° of 425 m³ capacity each.
- √ Raw material reception by train and truck.
- √ Load is done at 200 T/h.
- √ Unload is done at 120 T/h.
- √ Pre-cleaners.
- √ Dryers.
- √ Filtration systems.

2016 | Omega Bolivia

Plant conceived for the storage of soya and maize.
The total capacity of the plant is 47.793 m³ for the storage of 35.850 T of cereals. The project includes:

- √ 4 silos model 27.50/20 of 11.086 m³ capacity each.
- √ 4 buffer silos model 7.64/13 of 771 m³ capacity each.
- √ 1 bulk silo model 4.65/5 of 123 m³ capacity.
- √ 3 train load silos model 4.65/3 of 80,83 m³ capacity each.
- √ Two separates drying lines: The first line with one dryer of 75 T/h y the second line with two dryers of 75 T/h.
- √ Load is done at 150 T/h.
- √ Unload is done at 100 T/h.
- √ Cleaning systems.

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2016 | SNA Tunisia

Plant conceived for the storage of maize and soy beans.
The total capacity of the plant is 75.180 m³ for the storage of 56.400 T of cereals. The project includes:

- √ 10 silos model 22.92/14 of 7.518 m³ capacity each.
- √ Complex metal structures, catwalks of more than 3 meters wide that support doubly the loading of 200 T/h and specials towers.
- √ Turn-key project entirely made by Silos Cordoba.

2017 | Niger04 Nigeria

Turn key project conceived for the storage of maize and soy beans located at Kaduna State. The total capacity of the plant is 54.585 m³ for the storage of 50.000 T of sorghum. The project includes:

- √ 5 flat bottom silos model 24.45/22 with a capacity of 12.917 m³ each.
- √ Ventilation system
- √ Chain conveyors and bucket elevators.
- √ Loading and unloading is done at 250 T/h and 75 T/h.
- √ Towers, catwalks, support structure for elevators and pre-cleaners.
- √ Intake pit warehouse.
- √ Flow scale.
- √ Complete cleaning system, including De-awner, stone separator and magnetic separator. Electrical panel and control system.
- √ Complete assembly.

2017 | Ngeria 05 Nigeria

Turn-key project conceived for the storage of maize and soy beans located at Ilorin. The total capacity of the plant is 51.668 m³ for the storage of 40.000 T of cereals. The project includes:

- √ 10 silos model 24.45/22 of 12.917 m³ capacity each.
- √ Ventilation system.
- √ Bucket elevators and chain conveyors.
- √ Load is done at 250 T/h.
- √ Unload is done at 75 T/h.
- √ Towers, catwalks, support structure for elevators and pre-cleaners.
- √ Intake pit warehouse.
- √ Flow scale.