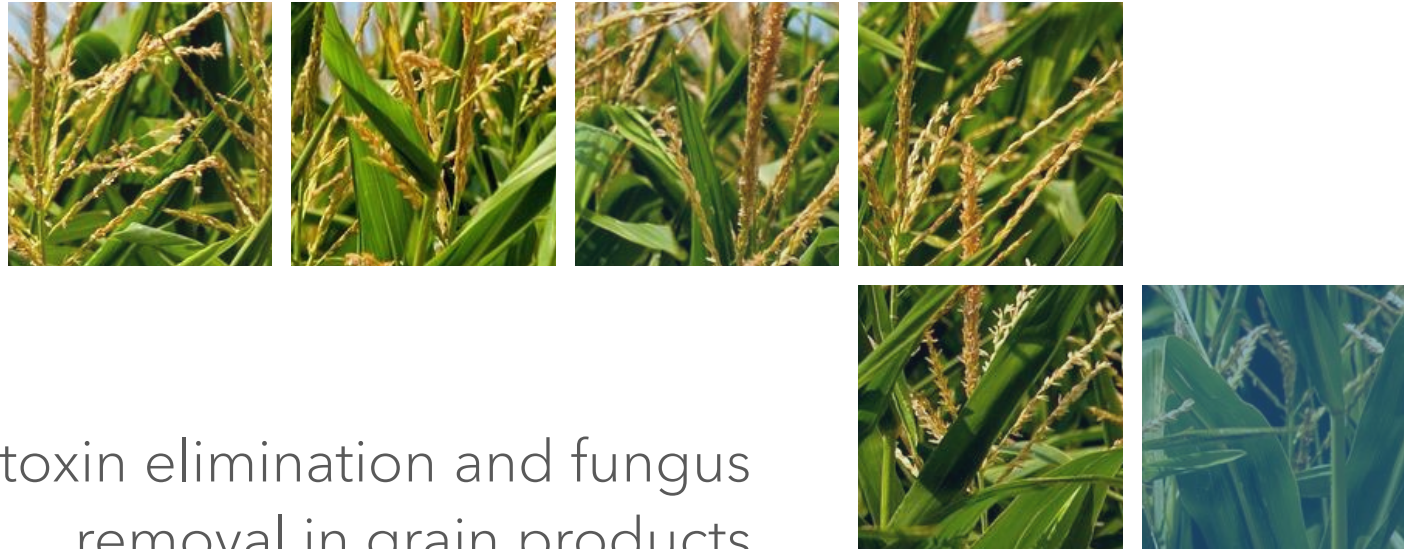
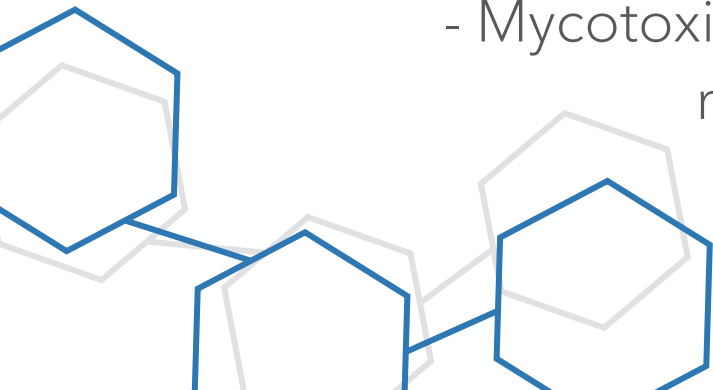


ExOZONE[®] PURE GRAIN

- Mycotoxin elimination and fungus removal in grain products



FUNGAL CONTAMINATION OF GRAINS

Although various agrotechnical, plant protection, and storage technology solutions based on good agricultural practices are available to reduce different fungal contamination, measurements in Hungary in 2022 showed that approximately 10% resulted in values above 20 ppb, around 20% above 10 ppb, and about 10% above 5 ppb for Aflatoxin B1. Unfortunately, similar results can be found for other mycotoxins (DON, T1, T2, ochratoxin, etc.) when examining the crops of the past few years globally.

Due to the continuously rising average temperature and unpredictable precipitation, farmers face increasing challenges each year to supply the market with toxin- and fungus-free grain. A solution is needed to reduce the contamination level in harvested grain. Currently, no other procedure besides ExOzone® technology can eliminate fungal toxins.

ExOzone® is capable of eliminating fungal contamination in grain and reducing mycotoxin levels to below health safety limits.

HOW IT WORKS?

The ExOzone® system is based on an industrial ozone-based disinfection device that is 100 times more efficient than commercially available equipment, and it generates ozone using ambient air and electricity. During the treatment, the grain stored in the silo is continuously blown through with an ozone-air mixture. The ozone decomposes the mycotoxins on the surface of the grain and simultaneously destroys the fungi.



OZONE

Ozone is an unstable molecule composed of three oxygen atoms. It is one of the strongest oxidizing and disinfecting agents. When it comes into contact with any bacteria, virus, fungus, or odor-causing element, it simply destroys and decomposes them. Like in traditional chemicals, appropriate substance concentration and exposure time must be applied during its use.

PRACTICAL USE

The application of the ExOzone® system for grain detoxification and fungus removal.

1.



During the preparation phase, the grain is sieved to remove contaminants (dust, stones, etc.) and broken kernels. After sampling, the toxin levels in the grain are measured.

2.



The device must be set up beside the silo, connected to the aeration inlet of it or in place of the ventilator fan. Depending on the type and mass of the grain, the type and level of toxin, and environmental parameters, the treatment time is selected, which can take 1-4 days.

3.



During the treatment, the silo is continuously blown through with a high concentration of ozone-air mixture, which oxidizes the fungi and mycotoxins on the surface of the grain.

4.



After the treatment, the already disinfected grain is sampled to verify that the toxin level has been reduced to the desired threshold, followed by the unloading of the grain.

CONDITIONS OF THE EXOZONE® TREATMENT

SCALING

To achieve the appropriate flow parameters and the maximum amount of grain, the treatment should be carried out in a silo capable of storing 400-2 000 tons of grain, filled to 60-85%.



AERATION FLOOR

To ensure the ozone-air mixture reaches every point of the treated grain mass, a silo with a full surface aeration floor is essential.



SIEVING

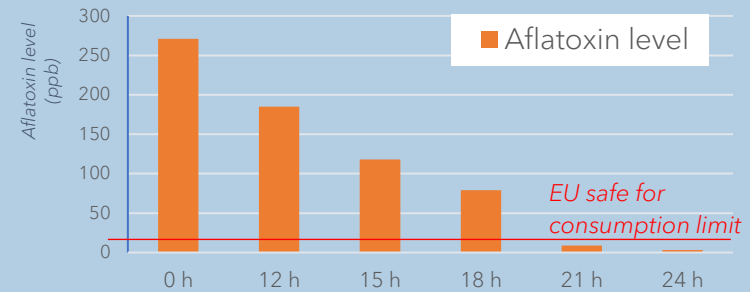
Different contaminants in the grain hinder the proper airflow, also the contamination level of broken kernels can be significantly different from that of whole kernels. Therefore, sieving the grain before treatment is necessary.



EXOZONE® PURE GRAIN MODEL

Grain with toxin levels above the health limit can only be sold at a reduced price compared to the normal market price, and its use poses difficulties. In such substandard quality batches, by applying the ExOzone® Pure Grain technology, the mycotoxin level can be reduced, and fungi can be eliminated. This way, the quality of the grain can be brought to a level suitable for any industrial or agricultural use, increasing the value of the grain.

Aflatoxin Reduction Test in Corn Using ExOzone® Technology*



*The measurements were performed by the Pannon University in Keszthely, Hungary



SAFE

In the United States, since 2001, the Food and Drug Administration (FDA) has deemed ozone safe for food disinfection.
- FDA, 2001



EASY TO INTEGRATE

The system's first use is as simple as the thousandth, requiring minimal installation. The system is mobile, allowing treatment in multiple silos on a single site.



LOW OPERATION COSTS

The ExOzone® system exclusively uses ambient air as fuel and operates with low specific power consumption.



SURFACE ONLY ACTION

Since the gas mixture only affects surfaces, the ExOzone® system does not alter the nutritional content of the grain.