



KOTZUR

ELEVATED DRYING SILOS



A family
owned
Australian
business



APPLICATION

In silo aeration drying of grain.

Short and long term storage of grain.

FEATURES

- Sealed gastight for long term storage and pest control.
- 7 smaller models fully factory assembled, 4 larger models erected on site.
- Zinalume/galvanised construction.
- Standard sight glass level indication and sealed gastight.
- Can be supplied with various fan and heater options.
- Standard base manhole and remote opening auto sealing.
- Optional wall ladder cage and external wall/roof ladder.
- Covered by Kotzur 5 year warranty.
- All silo models can be tailored to specific customer requirements.



ADVANTAGES OF DRYING GRAIN

The ability to dry grain after harvest increases flexibility and profitability for grain growers. Grain moisture must be below certain levels to ensure safe storage. For cereals this is around 12% and for oil seeds 5-9%. Harvesting at Higher moisture has a number of advantages;

Early harvest increases yield - Reduced shedding, harvester loss, bird/rodent damage. Yield losses are typically between 0.5% and 1% per day that harvest is delayed after the grain reaches maturity (at which it is usually greater than 20% MC).

Reduced risk - Reduce risk of weather damage to crop.

Early harvest results in improved grain quality - Higher grain moisture at harvest means less grain damage and improved qualities such as colour, viability, oil quality (in oilseeds), reduced chance of weather damaged grain.

Increased harvest window - Start harvest sooner (up to 10 days), longer harvest days, reduced weather interruption time.

Direct heading of crops - Some crops that have been traditionally windrowed/swathed may be direct headed where higher moisture harvest is possible.

Cropping in wetter climates - Grain growing in Australia has been often limited to areas where a dry weather harvest is likely. With grain drying, harvest weather becomes less of a problem.

AERATION DRYING CONSIDERATIONS

Aeration drying varies from conventional hot air drying in a number ways. There are a number of advantages and disadvantages to consider;

- **Aeration drying is low cost** - Compared with conventional drying, aeration drying has significantly lower capital cost and has around 75% lower energy consumption.

- **In Silo drying reduces grain handling** - Because the grain is dried in the silo there is less handling (reduced cost & less damage risk).

- **Aeration drying is "Gentle"** - Aeration drying is slower and requires little or no heat. This results in less damage (eg cracking, loss of germination, quality) to the grain being dried.

- **Aeration drying is slower** - Aeration drying is much slower than large conventional driers. This needs to be considered when determining the required throughput. Aeration drying rates in "Kotzur" Drying Silos will vary according to the silo/fan combination. Do not hesitate to ask.

- **Aeration drying is weather dependant** - Aeration drying relies on the air being "dry enough" to dry the grain, therefore relative Humidity is a key consideration. The graph below shows the relationship between relative humidity and moisture content in wheat. Temperature is also an important consideration in determining how fast the grain will dry. In ideal climatic conditions, drying fans may be run 24 hours per day, while in other cases, careful control of fan operation may be required to ensure that the fan only operates at dry times during the day or on dry days. Where humidity and temperature are not suitable for drying, supplementary heating is used to enable drying. Only small temperature rises (5oC - 15oC) are required.



THE KOTZUR DRYING SILO

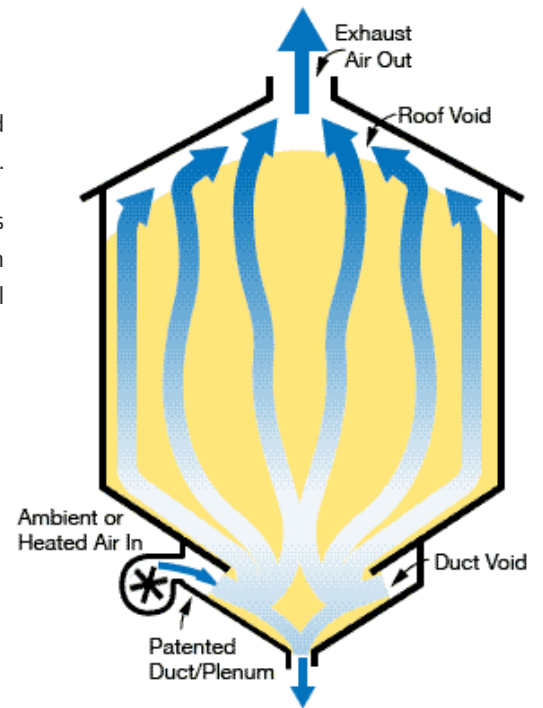
The Kotzur Elevated Drying silo incorporates a specially developed and patented plenum cone. This allows high pressure air to be forced through the grain efficiently.

The air is not restricted by screens or mesh and is fully self cleaning. The result is high volume air flow — in the order of 10 - 35 litres/second/tonne depending on model and product. This airflow is 5 - 20 times that normally used on conventional grain aeration.

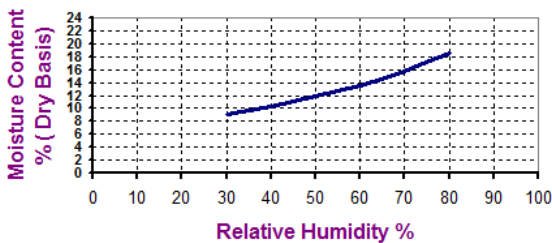
GRAIN MOISTURE CONTENT VS RELATIVE HUMIDITY

The following Isotherm Charts show the relationship between relative humidity and the moisture content of various grains. This relationship is important to determine if weather conditions are suitable for drying and whether supplementary heat is required.

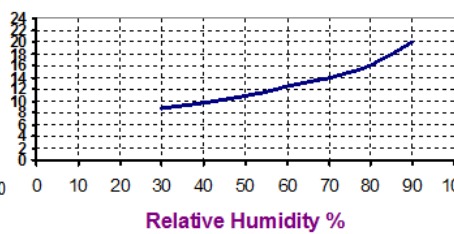
- Note that some charts show moisture content dry basis and others wet basis.
- Compiled by Andrew Kotzur using average data from "Handbook of Food Isotherms", Iglesias & Chirife, Academic Press 1982.



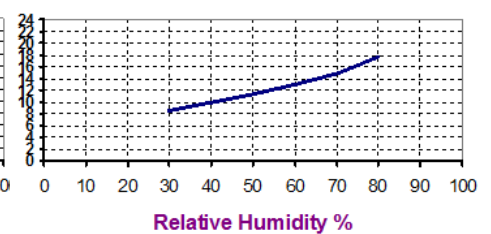
Sorghum @ 25°C



Wheat @ 25°C



Barley @ 25°C



WARRANTY - Kotzur Pty Ltd are confident in the quality of the products they design, manufacture and supply.

The following warranties apply:

- Structures including footings, elevator towers, walkways, silos etc - 5 years.
- Mechanical equipment including conveyors but excluding drive motors - 12 months.
- OEM equipment including drive motors and gearboxes - supplier warranty (generally 3 months).

This guarantee covers faulty design, engineering and workmanship; however this does not include problems arising from factors over which Kotzur has no control. These factors include footings constructed by others, negligent damage, unintended use of products, poor maintenance or care, normal wear and tear. Equipment manufactured by others and brought in by Kotzur Pty Ltd (e.g. Silo unloaders, aeration equipment) carry their respective manufacturers warranty. Please note this warranty excludes consequential losses.

MODEL	CAPACITY M ³	CAPACITY WHEAT T ⁽¹⁾	MAX LOAD T ⁽²⁾	HEIGHT CENTRE TO M	HEIGHT TO EAVE M	NOM. DIAMETER M	OUTLET HEIGHT MM ⁽⁵⁾	CONE ANGLE	AUGER LENGTH M (FT) ⁽³⁾	FOOTING PLAN STYLE	WIDE LOAD PILOTS ⁽⁴⁾	CENTRE FILL DIA MM	ROOF INSPECTION HOLE
K463DS	63	50	58	7.2	6.0	4.2	600	35	11.2 (37')	Round	1	610	OPT
K474DS	74	59	68	8.0	6.8	4.2	600	35	12.4 (41')	Round	1	610	OPT
K491DS	91	73	84	8.2	6.9	4.6	600	35	12.8 (42')	Round	2	610	OPT
K462DS*	62	50	57	7.1	5.9	4.2	700	35	11.0 (36')	Round	1	610	OPT
K478DS*	78	63	71	8.2	7	4.2	700	35	12.8 (42')	Round	1	610	OPT
K477DS*	77	62	71	7.4	6.1	4.6	700	35	11.5 (38')	Round	2	610	OPT
K496DS*	96	78	88	8.5	7.2	4.6	700	35	13.2 (43')	Round	2	610	OPT
GPE 8-4-35D	154	128	142	9.5	7.8	5.8	700	35	16.6 (55')	Round	Built on site	680	STD
GPE 10-4-35D	257	213	236	10.3	8.2	7.3	700	35	18.0 (59')	Round	Built on site	680	STD
GPE 10-5-35D	303	251	279	11.4	9.3	7.3	700	35	19.9 (65')	Round	Built on site	680	STD
GPE 10-6-35D	349	290	321	12.5	10.4	7.3	700	35	21.5 (71')	Round	Built on site	680	STD

1 - Wheat capacity based on typical consolidated/compacted bulk density in silo. **2** - Max load based on engineering design. This may not apply to products other than grain. **3** - Auger lengths are indicative only and are based on 35° angle for B.O.S Silos and 40° angle for Transportable Silos. **4** - Pilot/escort vehicle requirements may vary in certain locations (e.g. metropolitan areas). **5** - Nominal outlet height only.

* WE Profile manufactured in Toowoomba Facility.

ACCESSORIES

DESCRIPTION	PART NUMBER	SIZE	POWER REQUIRED
D4000 415V Single Phase Fan ⁽¹⁾	AERATION D 0217	7.5 Kw	50Kz240V/33A or 480V/17A
D4000 415V 3 Phase Fan ⁽¹⁾	AERATION D 0218	7.5 Kw	50Hz 415V 3F 13A ⁽¹⁾
Gas Drying Heater Kit ⁽²⁾	K059004	29Kw, 101MJ/Hr	240V/0.75A, LPG 1.5-2.1Kg/Hr ⁽³⁾
Diesel/Kerosene Drying Heater Kit ⁽²⁾	K059005	27Kw, 97MJ/Hr	240V/1.4A, Diesel 2.5 litres/Hr

1 - Current draw quoted is typical operating current. **2** - Kit includes heater and fan inlet air mixer. Mounting stand for heater is not included. **3** - LPG Consumption shown is minimum to maximum range.

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