KEITH
ENGINEERING

AIRLESS DRYING TECHNOLOGY

Developing drying technology for the future

WHY AIRLESS DRYING?

Airless Drying utilizes Superheated Steam as the drying medium instead of conventional hot air.

One of the benefits of Airless Drying is that Superheated Steam has heat transfer properties superior to air at elevated temperatures.

Superheated Steam Drying requires significantly less support from odor control systems and is safe to use in volatile environments, minimizing the risk of explosion and fire.

AIRLESS DRYING BENEFITS

- Faster Drying
- Improved heat recovery
- Controls foul odour and overheated product
- Reduced carryover of fines & dust, minimizing risk of explosion
- Enhanced control and fine tuning
- Operator friendly - remote access facility
- Control system tuneable
- No secondary contamination from heat source
- Significantly less demand on odor control systems
- Lower greenhouse gas emissions
- Smaller condensers
- Energy efficient
- Ease of environmental compliance
- Option to re-use steam for energy recovery
- No requirement for a boiler.

Operational Environmental

KEITH ENGINEERING

TECHNOLOGY

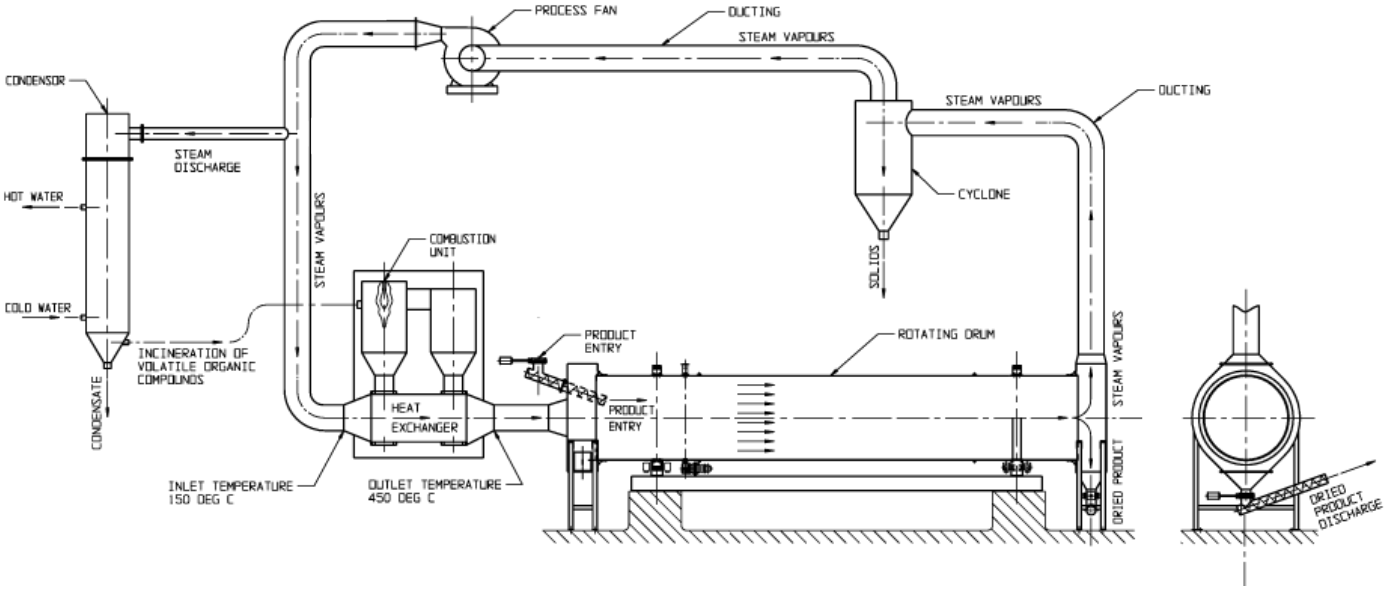
Airless Drying is a balance of process design engineering and material selection.

The Airless Drying process uses Superheated Steam at temperatures above 250°C (482°F), whilst maintaining atmospheric pressure throughout a self contained, sealed, airless environment.

The drying loop also creates energy savings by utilizing the energy in the excess steam (the latent heat).

The central control screen allows for easy operation. Dryers can also be accessed and monitored remotely.

SCHEMATIC



PRODUCT APPLICATIONS

Keith Engineering has successfully applied Airless Drying to the following products.

Pet Food
Wood Chip
Black Coal
Paunch Grass
Biosolids
Biomass
Mustard Seeds
Paper Pulp
Brewers Spent Grain
Beef Jerky
Corn Stover
Sugar Beet
Hydrolyzed Feathers
Saw Dust
Brown Coal
Poultry Blood
Poultry Raw Material
Organic Sludge
Saprolite Ore
Dog Biscuits
Distillers Grain
Corn Kernel
Olive Pumice
Nickel Ore
Seeds - High Nutrition Horse Feed
Silage
Feathers

	BEFORE	AFTER
RAW POND SLUDGE		
PAUNCH GRASS		

TESTING FACILITIES

Keith Engineering has Airless Dryers installed in the United States, Western Europe, Russia, Australia and New Zealand, drying a range of products, including pet food, rice, raw poultry products, grain/seed and meat and bone meal.

Advances in Airless Drying technology can be attributed to extensive commercial testing carried out at the Iowa Energy Center within the Biomass Energy Conversion facility (BECON) in Nevada, Iowa.

Keith's testing facility at BECON was established in 2008 to carry out commercial drying demonstrations and trials on a range of raw materials. Keith house test dryers in Sydney and Iowa that are available to prospective clients for drying demonstrations and product testing.

Airless Dryer testing unit with an evaporation rate of 125 kg/hour (275 lbs/hour)

Commercial Airless Dryer with an evaporation rate of 2000 kg/hour (4400 lbs/hour)

COMPANY HISTORY

Keith Engineering specialize in the design and manufacture of processing equipment for the meat rendering industry. Together with parent company, Pinches Group, Keith is committed to advancing and promoting new and emerging drying and processing technologies.

Keith has over 60 years of industrial engineering experience in Australia and around the world. Keith strive to serve the needs of clients seeking new and improved methods of drying.

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