

Efficient, Continuous Operation & Economical Drying Multiple Heat Sources: CHP, Biomass, Ground Source, Diesel & Gas



Typical Continuous Dryer for Biomass and Biogas Digestate
Efficient dewatering to increase value and decrease material handling costs.

Multiple dryer sizes with throughputs from 230 kg per hour to 4,500 kg per hour



Uniquely versatile - Handles most materials in any condition

Low temperature system - Preserves colour/quality & reduces risk

Low noise - All fans have special low noise impellers.

Fuel efficient - With recovery of exhaust air from final sections.

Variable speed drives - All motors are driven by variable speed drives.

Precise flow consistency - Mechanical flow via variable speed drive.

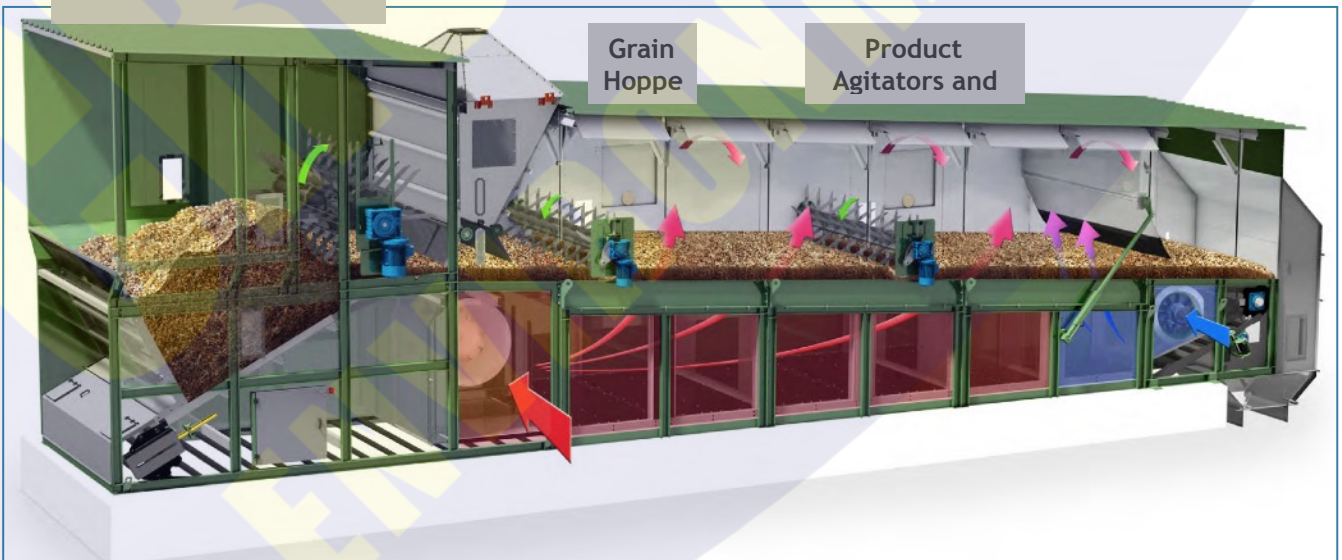
Inbuilt reliability - 12 months warranty with extension to a 2 year.



Dried Biogas Digestate at 10% Moisture Content.



Main Spinner
Spinner has variable height and speed for setting bed depth.



Multiple Drying Sections

Multiple drying sections allow for variation of airflow and temperature to suit product being dried.

Heat sources

Direct (gas, diesel, LPG burners, waste heat)
Indirect (hot water, steam, oil heat exchangers).

Cooling and Heat Recovery

Variable cooling section with ability to recover waste heat for improving drier efficiency.

Drying Digestate

Digestate and livestock slurries are high in water content, especially slurry. Typical dry organic solids content of digestate from a biogas reactor may be 8% and 3% for slurry.

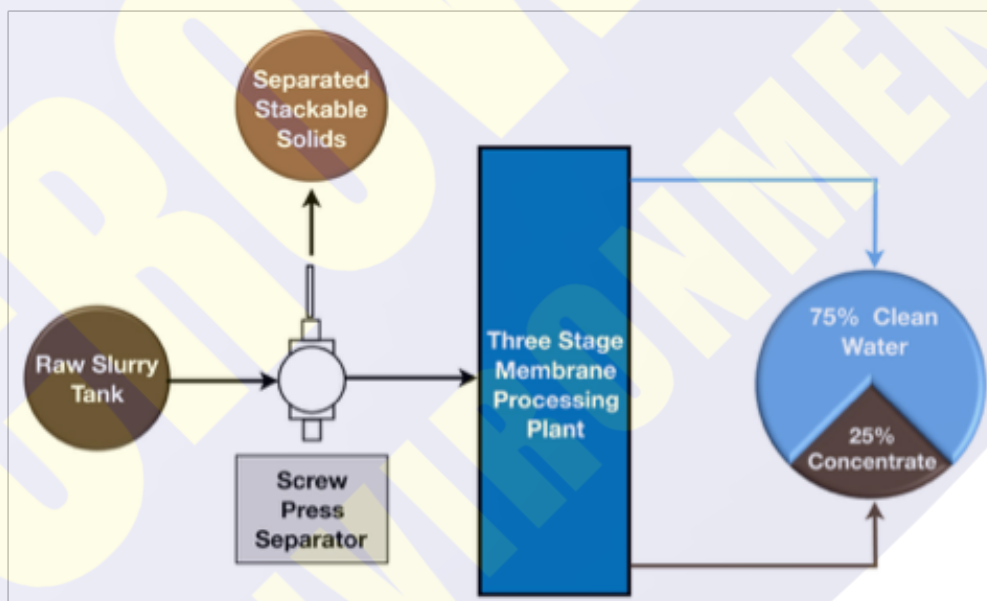
Although these products are valuable fertilisers for arable crops, the reality is the spreading costs are high as the operator is moving around mostly water meaning excessive tractor miles, CO2 emissions and risk of ground compaction.

Many regions cannot spread in the winter and in Nitrate sensitive zones, the slurries and digestate may need storing for seven months which is a capital intensive.

Separating the value in digestate and slurry from the water is becoming a necessity to improve agricultural efficiency. Technology such as membranes can do this and provide an additional benefit of locking up the Ammonia as NH_4^+ Ammonium in the form of Ammonium Sulphate. This not only significantly reduces ammonia emissions from the spread and stored digestate and slurry but makes more of the nutrient available for the crops rather than losing it to the atmosphere, so, win win.

Crowley Engineering, Co. Cork Ireland and Dynameau Ltd have developed a membrane system specifically for dewatering digestate and slurry. This will produce a concentrate stream with all of the original nutrients and a clean water stream which can go to land or be re-used.

The concentrate stream reduces the original volume by up to 75%.

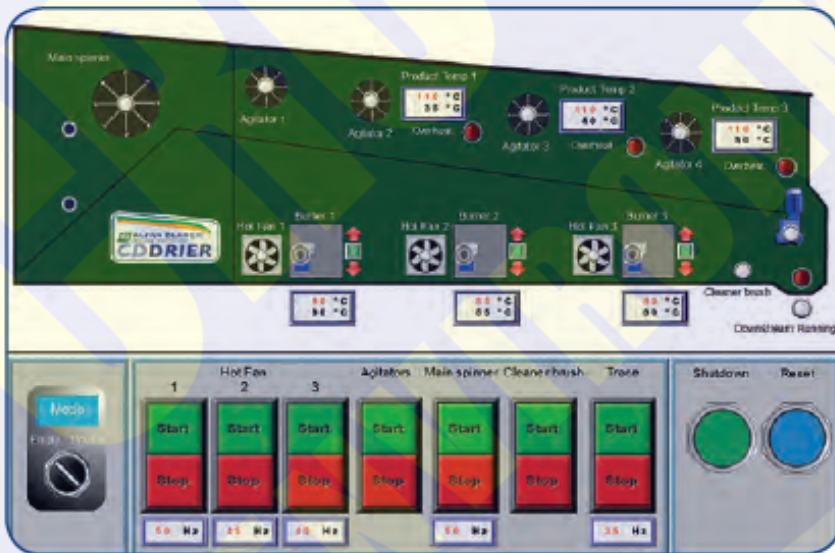


Further Drying

The membrane concentrate can be further dewatered by thermal drying using a grain dryer. This will require a heat source. Typically, a biogas plant with a CHP should have sufficient waste heat from the CHP to dry the membrane concentrate to 10% - 15% moisture content. Bio-methane to grid and livestock slurry operations are unlikely to have waste heat, so, consideration should be given to seeking out economical alternative heat sources.

Model	Drying at 70°C. Digestate 70% -15% MC	Drying at 70°C. Woodchip 50% -25% MC	Drying at 100°C. Grain 20% -15% MC	Thermal Power kW/th	Minimum Power Consumption kW	Dimensions (approx.)		
	Throughput Capacity kg/h	Throughput Capacity kg/h	Throughput Capacity kg/h			Length (m)	Width (m)	Height (m)
CD3100	230	500	3,100	160-250	7.5	10	2.0	4.0
CD4300	310	680	4,400	220-350	7.5	12.5	2.0	4.0
CD5700	410	920	5,800	290-470	11	12.5	2.6	4.0
CD7900	600	1,340	7,600	420-610	13	15	2.6	4.0
CD10600	820	1,830	10,900	580-900	17	17.5	2.6	4.0
CD13300	1,100	2,300	13,500	720-1,100	25	17.5	3.2	4.0
CD16000	1,200	2,610	15,600	820-1,300	23	21	3.2	4.8
CD19400	1,400	3,140	19,800	980-1,600	31	23.5	3.2	4.8
CD22200	1,700	3,760	21,900	1,180-1,800	28	26	3.2	4.8
CD25600	2,000	4,390	25,900	1,400-2,300	36	28.5	3.2	4.8
CD28400	2,100	4,600	28,000	1,400-2,300	41	32	3.2	5.4
CD31100	2,300	5,220	32,200	1,600-2,600	40	34.5	3.2	5.4
CD34600	2,600	5,820	34,300	1,800-2,600	48	37	3.2	5.4
CD38000	2,800	6,370	38,400	2,000-3,100	57	39.5	3.2	5.4
CD44200	3,300	7,390	44,600	2,300-3,600	51	46	3.2	6.3
CD50300	3,800	8,610	50,800	2,700-4,100	63	50.6	3.2	6.3
CD60400	4,500	10,000	61,000	3,100-5,000	71	50.6	3.8	6.3

Throughput, thermal and electrical power values are approximate and will vary depending on ambient conditions, product variation and drier set up.



PLC Control Panel with Data Recording

Versatile Control Systems

Fully integrated control systems for enhanced management. Plc systems incorporate large touch screen HMI for data recording, energy monitoring with remote access and control. Variable speed motor drives for optimal drying and energy efficiency



Biomass & Digestate Drying



Crowley Environmental is division of Crowley Engineering, Cork, Ireland making OEM products for the solid waste processing, water, gasification and biogas industries. With nearly a half century of business experience of engineering designing and fabrication, Crowley Engineering are your global partner in environmental solutions in the energy, solid waste and water treatment industries.

Dynameau Ltd, UK have partnered with Crowley Engineering to bring their water treatment technologies and solid waste processing capabilities to a wider market.



Crowley Environmental Products

PulpStar MSW Processing

Electrocoagulation Dirty Water Treatment

Oil Water Separation

Biomass to Energy Plants

Biogas plants

Biogas Digestate Treatment

Livestock Slurry Treatment

Biological FBBR Water Treatment

Solid Waste MRF's

Combine UV & Ozone Disinfection

Crowley Engineering

Grain, Biomass & Digestate Driers

Conveyors & Elevators

Feed mills complete

Agricultural silos & augers

Marine Pontoons

Helicopter escape simulators