



armfield

FLUIDISED BED DRIER

FT31
Provisional

The Laboratory Fluid Bed Drier has a number of significant advantages when compared with conventional drying techniques.

- High rates of heat and mass transfer
- Drying times and therefore residence times range from a few seconds to a few minutes - often less than 15 minutes are required for complete drying
- Materials with moisture contents from a few percent to over 80 percent may be dried
- The drying air temperature range is ambient to 100°C which covers the majority of drying operations
- A wide range of materials can be processed including organic and inorganic compounds, pharmaceutical chemicals, foods and fuels, minerals and agglomerating materials
- In addition to drying, other processes may be investigated e.g. mixing and blending of solids, size reduction, agglomeration and granulation, classification into sizes and cooling of particles

The drier can be used with a wide range of materials including fine powders, coarse particles, crystals, granules, even slurries or pastes (after decanting or pre-drying or by spraying onto an initial bed of the dried material).

Heat sensitive materials including foodstuffs like peas, wheat or lentils may be dried at relatively low temperatures.



DESCRIPTION

The drier is of simple, compact design, conveniently portable and easy to operate, the only requirement being a mains power supply.

Air is drawn through a mesh filter in the base of the cabinet and blown by a centrifugal fan over a 2kW finned electrical heater and through a stainless steel filter gauze before being delivered to the distributor gauze at the base of the drier body which supports the bed and distributes the air uniformly.

The air blower is controlled by a thyristor circuit to give a smooth vibration over a wide range of motor speeds, enabling efficient fluidisation to be achieved for a variety of materials and giving fine control of the drying temperature. Readings are selected and displayed using a digital meter. The unit can be manually operated or interval timing can be carried out with the timer unit, which gives a 0-10 minute timing range and an alarm facility to notify completion of the operation.

The tube unit locks into position on the cabinet top by a simple bayonet fitting and the base of the tube is removeable to allow replacement of the distributor gauze. A filter bag is employed to retain any stray particles of the sample being fluidised, allowing the passage of the exit gasses.

EXPERIMENTAL WORK

- Simple drying of a material to give moisture content and the drying time (or residence time) required
- Determination of drying curves to assess the feasibility of fluidised bed drying of a material on an industrial scale. Drying curves are irrelevant to the mechanism of drying - they may be used as a basis for heat and mass balance, thermal efficiency of drying and drier design
- Calculation of heat transfer coefficients for different conditions - important in drier design and comparison of fluidised beds with other drying methods

TECHNICAL SPECIFICATION

Power consumption:	3kW
Temperature range:	20 to 100°C ($\pm 1^\circ\text{C}$)
Timer range:	0 to 10 minutes
Max. sample weight:	5kg

SERVICES REQUIRED

Electrical supply:

FT31-A:	220-240V/1ph/50Hz
FT31-B:	120V/1ph/60Hz

OVERALL DIMENSIONS

Height:	260mm
Width:	320mm
Depth:	465mm

SHIPPING SPECIFICATION

Volume:	0.6m ³
Gross weight:	80kg

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