



1. General

The spray dryer should be suitable for research laboratories of pharmaceutical, alimentary and chemical industries.

In fact, the drying process through nebulization allows obtaining an extremely micronized and homogeneous product with a reduced working time.

The tests carried out with the IC40D unit are economical as a small quantity of product is sufficient to get significant data which can also apply to industrial type plants.

All major components are housed within a stainless steel cabinet and the unit can be used on a bench top. The system is designed to be conducted by a touch screen and allows two operation modes: automatic mode and eye-monitored mode to easily control the experimental process. Spray chamber, cyclone separator and receiving tank should be all made of borosilicate glass which can resist strong acid/alkali and high temperature. It can work in a no-pollution environment and the whole process can be inspected.

The study unit is supplied with manuals which describe the components, the installation and utilization procedures as well as some exercises with experimental results.

2. Composition

- Frame made of stainless steel.
- Variable speed electric fan.
- Maximum sample feed: 2000ml/h.
- Filter at the inlet to prevent sample contamination
- Electric heater.
- PID temperature control, precision: $\pm 1^{\circ}\text{C}$
- Integral compressor.
- Peristaltic feeding pump.

- Nebulizer.
- Feeding tank.
- Drying chamber.
- Cyclone powder separator.
- Dried product collecting tank.
- Automatic de-blocking device to prevent the nozzle to be blocked.
- Electric control board.

3. Technical Features

- Air inlet temperature range: 30°C ÷ ~300°C.
- Air outlet temperature range: 30°C ÷ ~140°C.
- Minimum sample: 30ml.
- Blowing rate: 0÷330m³/h, 686Pa.
- Oilless air compressor: 4.2m³/h, 2÷5bar. The sound is lower than 40db.
- Touch screen to display temperature, airflow volume, air pressure, pump speed and de-blocker frequency.
- 0.7mm jet.
- Dried product collecting tank.

4. Description

A menu driven micro processor controller allows the selection of inlet temperature, airflow, automatic de-blocker frequency and pump speed. The controller features an RS232 output for connection to PC or data logger and the software allows the control and monitoring of all functions and printing of results. The self-priming peristaltic pump delivers the sample liquid from a container to the main chamber. At the same time and integral compressor pumps air into the outer tube of the jet, this causes the liquid to emerge as a fine atomized spray into the drying chamber. Heated air is blown through the main chamber evaporating the liquid content of the atomized spray. The solid particles of the material, which are normally in a free flowing state, are then separated from the exhausted airflow by a cyclone and collected in the sample collection bottle. The exhaust airflow is directed through a flexible 60mm diameter hose to the atmosphere or to an existing extraction system.

5. Experiments

- Drying of aqueous solutions of different materials.

6. Required services

- Electrical supply: 220V single-phase, 50/60Hz; 3 kW

7. Weight and dimensions

- Dimensions: 800 x 650 x 1300 h mm
- Net weight: 110 kg