



SD-06 Laboratory Scale Spray Dryer

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INTRODUCTION

The Lab-Plant SD-06 Laboratory Scale Spray Dryer is the result of 30 years of continuous development in the field of laboratory scale spray drying systems.

The unit is self contained and supplied complete and ready for immediate operation. All major components are housed within a stainless steel cabinet and the unit can be used on a bench top or with an optional stainless steel stand.

The SD-06 only requires connection to a 13 amp, 220/240 V, 50 Hz power supply (Other Power Requirements Available) and provision for exhausting the evaporated moisture to atmosphere or to an existing extraction system.

TECHNIQUE

A menu driven microprocessor controller allows the selection of inlet temperature, airflow, automatic de-blocker frequency and pump speed. The controller features an RS 232 output for connection to a PC or datalogger and 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 through a small diameter jet into the main chamber. At the same time an integral compressor pumps air into the outer tube of the jet which causes the liquid to emerge as a fine atomised spray into the drying chamber.

Heated air is blown through the main chamber evaporating the liquid content of the atomised spray. The solid particles of the material, which are normally in a free flowing state, are then separated from the exhaust air flow by a cyclone and collected in the sample collection bottle. The exhaust airflow is directed through a flexible 50 mm diameter hose direct to atmosphere or to an existing extraction system.

APPLICATIONS

Spray drying can be used in a wide range of applications where the production of a free-flowing powder sample is required. This technique has successfully processed materials in the following areas:

Beverages • Flavours and Colourings • Milk and Egg Products • Plant and Vegetable Extracts • Pharmaceuticals • Heat Sensitive Materials • Plastics • Polymers and Resins • Perfumes • Ceramics and Advanced Materials • Soaps and Detergents • Blood • Dyestuffs • Foodstuffs • Adhesives • Oxides • Textiles • Bones, Teeth and Tooth Amalgam and many others.

Most solutions and suspensions can be spray dried providing that the resulting product has the characteristics of a solid material.



SD-06 Main unit on stand.

ADVANTAGES

Almost all other methods of drying e.g. the use of Ovens, Freeze Dryers or Rotary Evaporators produce a soft mass of material often described as a cake. This cake then requires further processing (grinding, filtering etc.) and the resulting material is often of very irregular particle size and shape.

The Spray Drying process usually produces a free flowing powder sample of a spherical nature and can produce very fast results from a small liquid sample.



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CONTROLS AND FUNCTIONALITY

The unit is designed to ensure that all functions are simple to select and adjust, to quickly achieve the optimum conditions for Spray Drying.

Using a clear LCD display, which is protected to IP65, the operator can control the following functions :

- Inlet temperature
- Airflow volume
- Pump speed
- De-blocker frequency

SD-06 Control panel screens.



Start screen.



Temperature selection.



Pump speed selection.



Unit operational.



End of process.

CONSTRUCTION

A robust chemically resistant 316 grade stainless steel cabinet houses all mechanical and electrical components necessary to perform the spray drying process. All clamps and fittings are designed to allow assembly and removal of the glass components in only a matter of seconds.

The rear of the cabinet includes an inlet filter designed to remove 99.99% of air laden particles ensuring that the drying air does not include contaminants.

A specially designed stainless steel support stand is available where bench space or height restrictions are a consideration.

TWO FLUID NOZZLE

The stainless steel spray assembly consists of an inner tube for the liquid sample leading to a small diameter jet. An outer tube directs the supply of compressed air to the nozzle and the close tolerance gap between the nozzle and the jet ensures a fine vaporised spray. The SD-06 is supplied as standard with 0.5 mm jet and other sizes are available as accessories.

The spray assembly incorporates an automatic de-blocking device that prevents the jet nozzle from becoming blocked. The de-blocking needle is activated by an integral compressor.

De-blocking is sometimes necessary with materials which may solidify or when large particles in suspension cause blockages in the jet.

TECHNICAL INFORMATION

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| Evaporation rate of water at inlet temperature of 250°C using Standard Chamber | Approximately 1500 ml/hour |
| Air inlet temperature range | 40°C to 250°C |
| Drying air throughput | Variable from 100 to 300 m ³ /HR |
| Heater capacity | 3 kW |
| Compressor | 2.0 m ³ /hr @ 2.0 bar / 1.7 m ³ @ 4 bar |
| Sample feed | Peristaltic pump with flow rate variable up to 32 ml/min (2.0 l/Hr) |
| Jet de-blocking | Integral 2.3 bar compressed air supply with variable de-blocking plunger frequency |
| Spray system | 2 fluid nozzle with standard 0.5 mm jet and options of larger diameters |
| Spray/hot air flow | Downward co-current |
| Power supply | 220/240 V - 50/60 Hz - 13 amps (Other Power Requirements Available) |
| Dimensions | 1110* x 825 x 600 mm (H x W x D) |
| Unit Weight | 80 KG |

*without jet assembly

We reserve the right to change information given without prior notice.



SD-06 Glassware.



SD-06 Components.

ORDERING INFORMATION

SD-06

Spray Dryer SD-06 complete 220/240 V - 50/60 Hz (Other Power Requirements Available) Complete with all parts necessary for spray drying including blower, heater, heater control, exhaust temperature indicator, spray system with 0.5 mm jet, spray atomiser compressor, auto jet de-blocking system with compressor, 215 mm OD x 500 mm long main chamber, cyclone and all glassware.

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