

Tall Form Spray Dryer – FT80

The Armfield FT80 Tall Form Spray Dryer has been purpose-designed to enable laboratory quantities of products to be processed.

Despite the size of the equipment, the powders produced will be comparable to large-scale production dryer capability.

The system offers unparalleled flexibility with separate, individually controlled inlet and outlet fans, together with variable nozzle positions and a selection of co-current or counter-current flow configurations. This flexibility is enhanced by an unsurpassed range of options, purpose-designed for laboratory and research use.

**RESULTS LOGGED VIA EASY TO USE CONTROL SOFTWARE
HUGE RANGE OF TEST CAPABILITIES
CAN DRY LESS THAN 1l OF PRODUCT
MANY ADD ON OPTIONS AVAILABLE**



Features / benefits

- ▶ No clogging, no need for de-blocking devices
- ▶ Co-current flow for drying heat sensitive products
- ▶ Counter-current flow maximises chamber residence time for non-heat sensitive products
- ▶ Residence times in the drying cylinder variable up to 9 seconds
- ▶ Data recording to computer for rapid evaluation and comparison
- ▶ Drying air temperature up to 250°C
- ▶ Maximum flow rate up to 7 l/hr
- ▶ Maximum evaporation rate of 3 l/hr
- ▶ Tall form chamber straight side to diameter ratio of 3:1 conical discharge section
- ▶ Advanced two-fluid nozzle atomisation system
- ▶ Individual inlet and exhaust fans with variable-speed control
- ▶ Bag filter and trace heating options
- ▶ Flexible controls and full instrumentation provided in the IP65 control console
- ▶ Easily dismantled for inspection and cleaning purposes
- ▶ Compact, mobile design
- ▶ Data logging facility for all key operating parameters
- ▶ Powder discharges from two points, chamber and cyclone
- ▶ Low noise levels
- ▶ Control and measurement of relative humidity
- ▶ Spark arrester on input and enhanced safety extraction fan

Process description

Co-current spray-drying configuration

The liquid to be dried is pumped to the top of the drying chamber by a variable-speed progressing cavity pump, which provides a very smooth flow and constant flow rate. It is atomised by a two-fluid nozzle and enters the drying chamber as a fine droplet dispersion.

Hot air is blown into the chamber, on to the droplets causing flash evaporation of the surface moisture.

The bound moisture in the particles is evaporated in the time that they fall to the discharge point at the base of the cone (the residence time). In this configuration the particle temperature will never exceed the wet bulb temperature of the exhaust air.

A variable-speed centrifugal fan provides control over the inlet air flow and a steady inlet temperature is achieved by using a three-term controller in conjunction with an electric heater. A second variable-speed fan draws air from the chamber through a cyclone separator. This 'push-pull' fan system provides flexibility to operate the chamber at variable pressures with variable residence times.

Two powder collection points are provided, one at the bottom of the main chamber, and one on the cyclone separator. This enables particles of different sizes to be collected simultaneously and/or separately.

Exhaust-air relative humidity can be measured and controlled so as to enable the system to run at the required RH level.

The nozzle is an external-mix two-fluid atomising nozzle. Compressed air is directed onto the liquid stream as it leaves the nozzle body and immediately atomises it. With this type of nozzle the orifice is larger than a single fluid type, and so it is possible to atomise more viscous products and even products containing suspended solids.

Counter-current spray-drying configuration

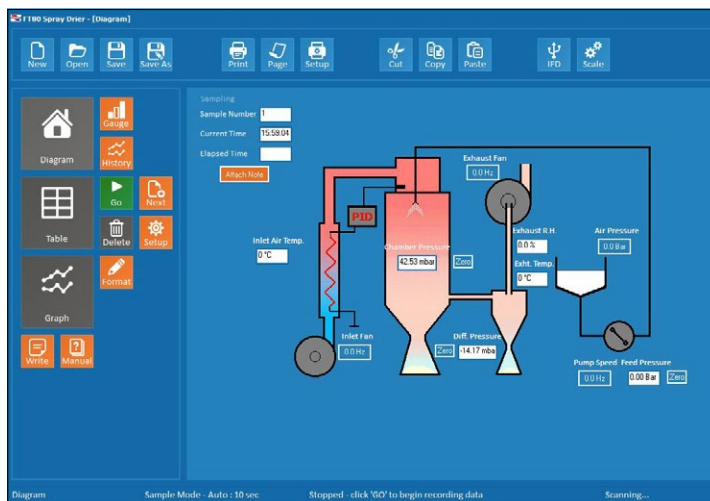
The FT80 Tall Form Spray Dryer is supplied as standard with two nozzles and nozzle hoses, one for co-current and one for counter-current. In counter-current configuration the nozzle is positioned at the bottom of the chamber and sprayed upward into the flow of hot air.

Fluid Bed Cooler Accessory – FT80-60

An optional accessory is available to provide final cooling of the spray-dried powder in a fluidised bed.

This feature is particularly useful when drying powders containing fats as the fluid bed helps to crystallise the fat content.

Typical applications include infant formulas and whole milk powders.



Software Screen

Powder collection at two separate points



Bag Filter Accessory – FT80-70

The Bag Filter Accessory is used on the exhaust air outlet. The five micron filter removes virtually all of the remaining product dust in the airstream, resulting in clean air that can be discharged directly into the working area, without requiring further treatment, ducting or extraction fans.

Note: This filter is not designed to extract toxic or hazardous materials.



Requirements

Scale



- ▶ Single-phase electrical supply (see ordering codes)
- ▶ Compressed air: 1-5 bar pressure, 0.05 m³/min
- ▶ PC: Optional (if using the optional Data Logging System a PC with a USB port, and running Windows XP or later is required).

Applications

- ▶ Dairy
- ▶ Liquid Foods
- ▶ Pharmaceuticals
- ▶ Nutraceuticals
- ▶ Flavours & Fragrances

Windows™ Data Logging Systems

A unique benefit of the Armfield miniature-scale food processing range is that the measured data may be captured and stored to disk.

An **Armfield FT80-DTA-ALITE Data Logging Accessory** transfers results to a PC. Temperatures, pressures and relative humidity can be monitored in real-time.

The data can be displayed in graphical and tabular forms and printed.

A PC with a USB port, and running Windows XP or later is required.

Technical specifications

General

Liquid feed	2-7 l/hr from variable-speed progressive cavity pump
Air flow	Up to 30scfm, using variable-speed fans in 'push-pull' configuration
Chamber residence times	Variable up to 9 seconds
Powder collection points	Separate chamber and cyclone discharge points
Atomisation nozzles	2-fluid type

Spray drying

Electric air heater	4.5kW
Drying air temperature	50-250°C
Evaporation rates	1.5-3 l/hr
Typical particle size range	20-120 microns

(Note: not all parameters are necessarily achievable simultaneously)

Overall dimensions

	Model	FT80
Length		1.30m
Width		0.62
Height		2.0m

Packed and crated shipping specifications

Volume	2.23m ³
Gross weight	333Kg

Product hopper



Product is atomised by a two-fluid nozzle and enters the drying chamber as a fine droplet dispersion



Ordering codes

FT80 Tall Form Spray Dryer

- ▶ FT80-A: Tall Form Spray Dryer: 220-240V/1ph/50Hz*
 - ▶ FT80-G: Tall Form Spray Dryer: 220-240V/1ph/60Hz*
- (* Max 35A)

Optional accessories

- ▶ FT80-60: Fluid Bed Cooler Accessory
- ▶ FT80-70: Bag Filter Accessory
- ▶ FT80-DTA-ALITE: Data Logging System

Optional GMP compliance

- ▶ The FT80 can be produced to full GMP compliance standards. Contact Armfield for further details.

Knowledge base

- > 28 years expertise in research & development technology
- > 50 years providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company



armfield.co.uk

Aftercare

Installation
Commissioning
Training
Service and maintenance
Support: armfieldassist.com

Armfield standard warranty applies with this product