13 mm Twin Screw
Mini Laboratory Extruder

Scientific Equipment!

Introduction

This equipment has been specially designed for diverse and precise mini extruding processes.

With the capabilities to achieve the maximum chemistry characteristics with minimum output rates using minimum batch quantities.

Special attention has been made to ensure precise smooth output motion of the extrusions, which is particularly important when performing low volume output rates for single fibre/strand extrusions etc.

A strong focus has been made in regards to reliability and usage of ISO standard components where possible.

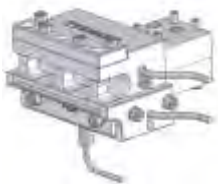
13 mm TWIN SCREW MINI LABORATORY EXTRUDER

Features

- Outputs 2 grams/hr. to 500 grams/hr. with excellent flow motion and a minimal free volume for small batch quantities. Max Pressure 100 bar
- Superior mixing when performing minimum material outputs rates (processing fibres etc.)
- Maximum screw wing tip speeds at minimum material output rates
- Precision segmented screw modules for variable chosen mixing screw configuration setups
- Unique barrel design, enabling maximum varied temperature control between mixing zones
- Temperature ranges, Ambient to 400 degrees Celsius
- 3 Auxiliary Temperature outlets
- Multiple inlet ports for multiple purpose operations (liquid, gas, powder or vacuum)
- Superior sealing of barrel and screw drive system
- Remote electrical control box
- Servo motor drive system – screw speeds 1 to 350 rpm (Constant Torque)
- Touch screen operation and programmable speed over pressure control

Optional Auxiliary Equipment

Dehumidifying Dryer



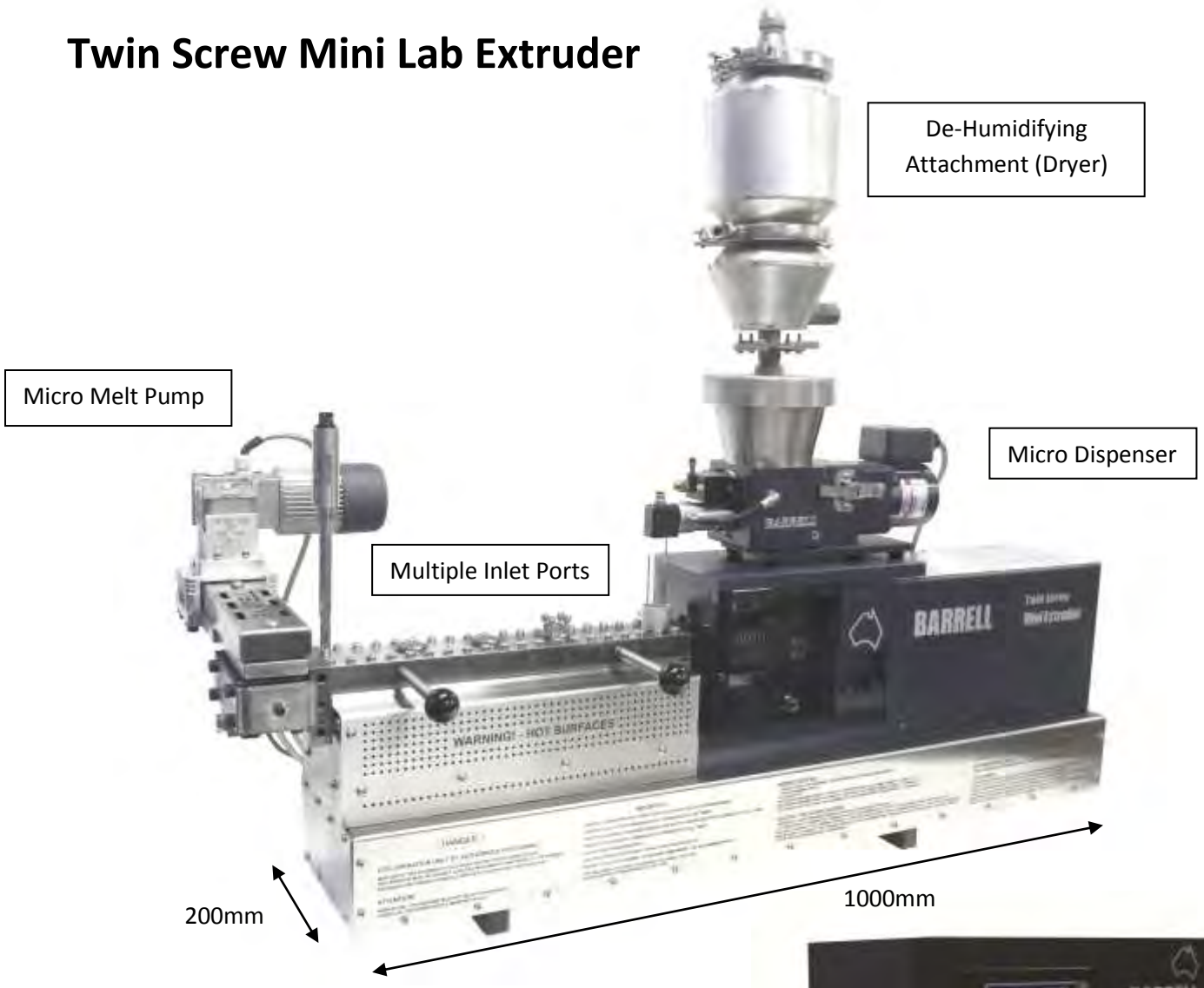
Film/Sheet Die

Micro Dispensers

Co – Extrusion Tooling

Micro Melt Pump

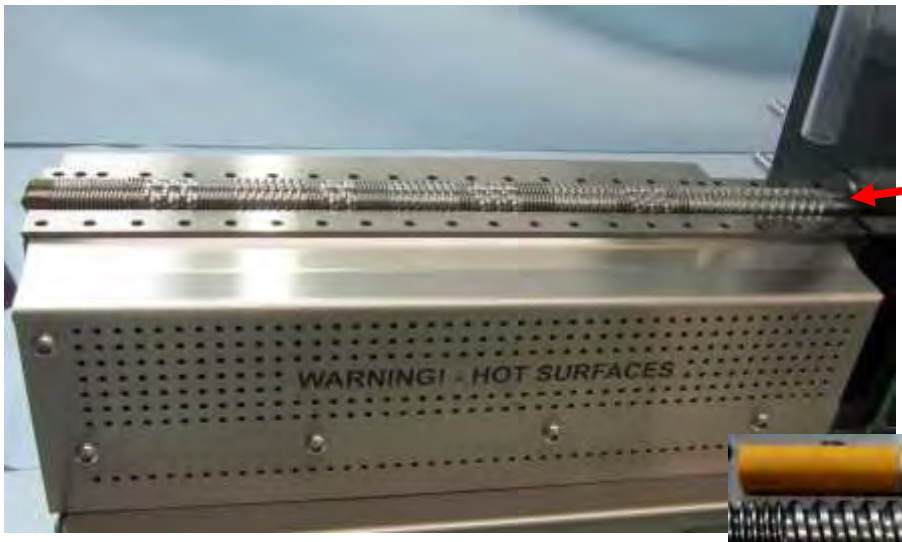
Twin Screw Mini Lab Extruder



Remote Electrical Control Box

- Touch Screen
- 12 Channel Temperature control
- 500mm H x 500mm W x 370mm D

Precision segmented screw modules for variable chosen mixing screw configuration setups



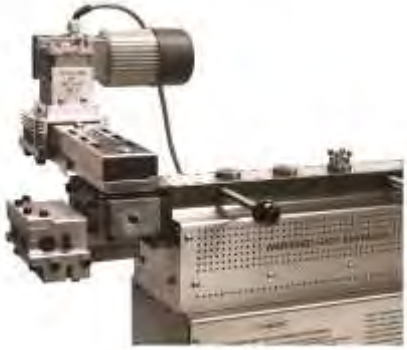
Twin Screw and barrel sealing

Inside view of split barrel

Standard Extruder Setup

View of Melt Pump Setup

(Vertical or Horizontal Extrusion)



View of Film/Sheet Die Setup

Mini Twin Screw Lab Extruder

Product Design Brief

Fully Intermeshing Counter Rotating Screws were best suited for the mini twin screw extruder for the following reasons below.

Co-rotation screws versus Counter rotation screws

- **Co-rotation! (Intermeshing)**
  Generally speaking co-rotation is most favorable in today's larger commercial extrusion machines, due to good mixing and high materials output. Co rotation is more popular in a production sense due to the high outputs volumes.

- **Counter Rotation! (Intermeshing)**
  Generally speaking counter rotation has a higher shear/mixing action and the materials pass through the barrel slower with a lower materials output. Counter rotation is less popular in production, due to the lower outputs volumes.

However!

Whilst ***Co rotation*** is preferred for larger physical strength high output extruders, Mini twin screw extruders lack the mixing shear/friction characteristics and physical screw strength.
In the case of ***Counter Rotation***, a higher shear/mixing action is achieved and the material passes through the barrel at a slower output rate, increasing the mixing time.

The geometry of the ***Counter Rotation*** screw flights will also reduce the amount of free volume in the machine. This geometry also enables finer screw pitch. Which means smaller quantities of material can be processed at lower output rates as per the RPM speeds of the screws, this will also enable a higher wing tip speed of the screws.

Therefore ***Counter Rotation*** will deliver greater mixing per length of screw, meaning the screw length over diameter (LD) can be shorter due to an increased length of the flight path, which will make the screws stronger and enable the screws to be worked harder, achieving better shear/mixing qualities.

Up scaling to commercial high output processing.

We believe up scaling the extrusion process characteristics from a mini counter rotation extruder to a commercial sized high output Co Rotation extruder is not a problem and can be easily achieved if necessary.

Processing wood particles,

Wood particles can tend to compress and create high levels of friction and stress in a machine, causing possible seizer of the machine. As a rule, wood particles used in a mini twin screw lab extruder, would need to be kept to a minimum size. E.G. flour size if possible. The particles would then need to be diluted to suitable machine ability.

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