

HILLS INC

7785 ELLIS RD.
WEST MELBOURNE, FL 32904
PH: (321) 724-2370
FAX: (321) 676-7635
E-MAIL: sales@HILLSINC.NET
WEB SITE: WWW.HILLSINC.NET

Lab Scale Bicomponent

Extruder Fed

Spinning Machine

Model LBS

Equipment Specification

October 2011

Machine Description

This machine is designed for laboratory use to make small amounts of bicomponent fiber from small amounts of polymer. It requires as little as 20 grams of polymer to make 100 meters of fiber. It's simplified design also makes it easy to operate and maintain. The system consists of 2 single screw extruders connected to a spinneret block. Metering pumps are eliminated to reduce the minimum polymer requirements and maintenance. The extruder speeds are set to deliver the desired flow rates. Mechanical torque limiters are provided to prevent over pressure. Note that the simplified design means the tolerances of fiber properties (denier & bico ratio) are limited to +/- 10%

It is easily disassembled for cleaning. In addition to the pack, there are only 5 wetted parts to be cleaned with no blind passages.

The machine is very versatile. With optional parts, the machine is convertible to run monofilaments, high temperature polymers, meltblown and spunbond webs in almost any cross section desired.

Equipment specifications

Model LBS – 100 - Lab Scale Bicomponent Melt Extrusion Unit - Base unit

Complete unit ready to run

1. Extruder unit, with drive mechanisms
(Variable speed D.C. electric motor driven)
 - Extruder Barrel Pressure rating of 7,500 psi (500 bar)
 - Screw size 5/8" dia – 24:1 l/d (16mm)
 - Can deliver polymer pressure of 2500 psi (166 bar)
 - Temperature capability of up to 310 °C with temperature control of $< \pm 3.5$ °C.
 - Electrically heated, 5 zones: 2 / extruder; 1 spinneret
 - Pack block - 17-4 ph stainless steel
 - Torque limitation on extruder screw.
 - Throughput range: 0.05 to 2.0 lb / hour for each extruder.
 - Control of extruder screw speed $\pm 5\%$ via KBIC dc motor controller (pressure controls optional)
 - Quantity of unused polymer in each system less than 10 cc

2. Spin Pack – qty 1
 - Spinneret: 19 round holes, 0.5mm dia, shaped holes available
 - Screen sandwich type filters

- Distribution plates for homo, side-by-side, sheath/core, 16 segment pie and 36 islands-in-the-sea. Others available such as: nanofiber islands in the sea, 10 stripes, trilobal core, hollow fiber, etc.
- Screens and seals for 25 pack builds

3. Fiber Winder, lab style

- 50 – 1000 meter / minute, 75 mm id x 150 mm cardboard bobbins

4. Space Requirements

- 12' wide x 4' deep x 10' high (3.6 meter wide x 1.3 meter deep x 3.3 meter high)

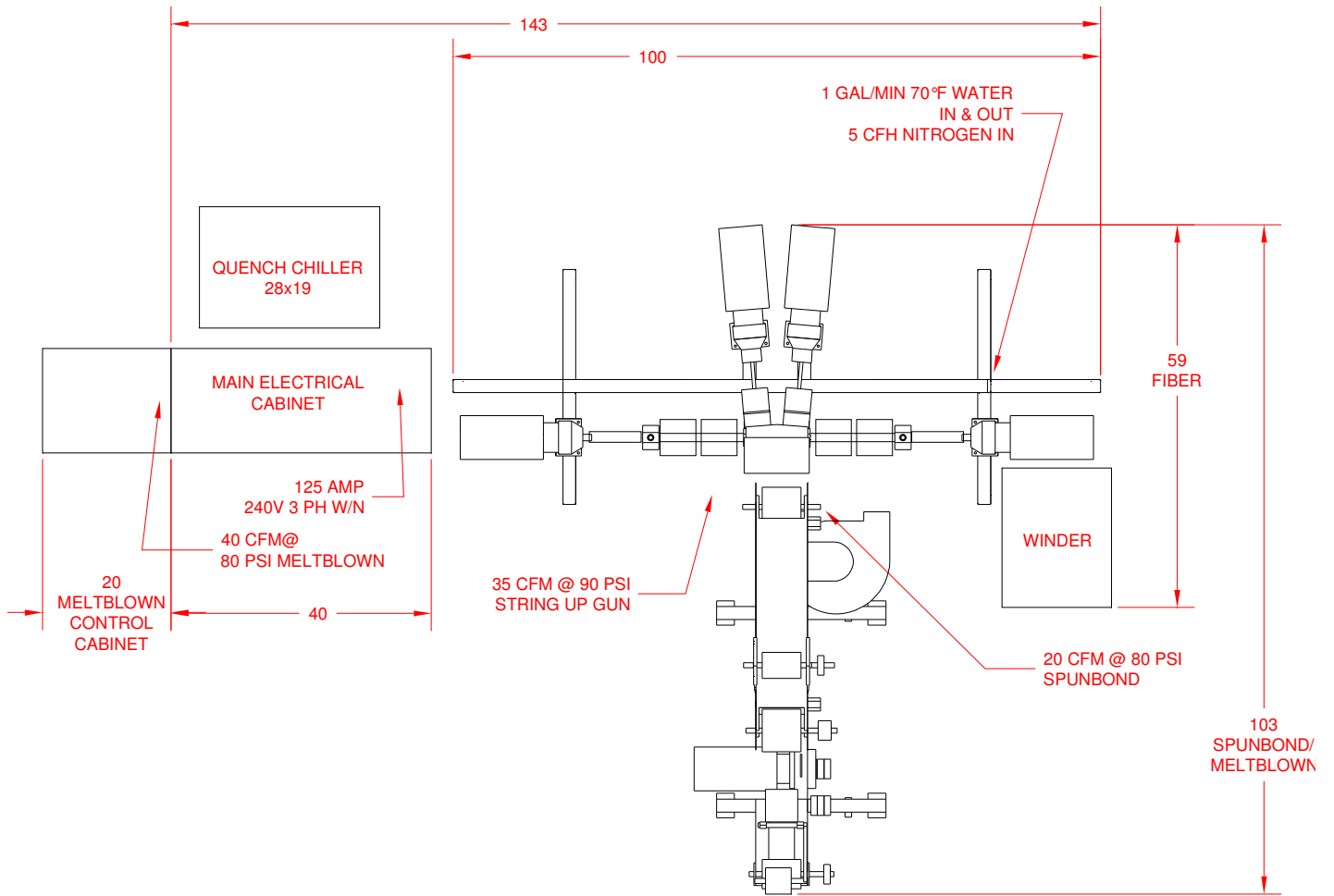
5. Utilities: 230 vac – 3 phase, 125 amp,

- 35 cfm 90 psi compressor air (intermittent) for string up aspirator
- 40 cfm 80 psi compressor air for meltblown pack
- 5 cfh nitrogen for hopper purge
- 1 gpm water @ 30°C for extruder cooling

Options & Accessories

The machine can run FOY yarn, meltblown webs, spunbond webs and mono filaments with the optional equipment as shown in the sketches below.

- Air quench cabinet w/ variable speed blower
- Chiller coil for quench cabinet for customer supplied chilled water
- Air chiller for quench cabinet, self contained unit
- Melt pump upgrade, includes: melt pumps, drives and controls
- Pressure read outs, dial or digital type
- Spin finish system, kiss roll type
- Draw roll stand
- Production type winder
- Temperature rating to 475°C
- Hastoloy wetted parts for running flouropolymers
- Water quench for monofilament
- Meltblown upgrade, includes air heater and meltblown dies
- Web collector drum with winder and leader sheet unwind for meltblown webs
- Gun type Spunbond aspirator
- Web forming table with compaction roll, calendar, winder and leader sheet unwind for spunbond webs
- Special extruder screws
- Custom packs for any cross section



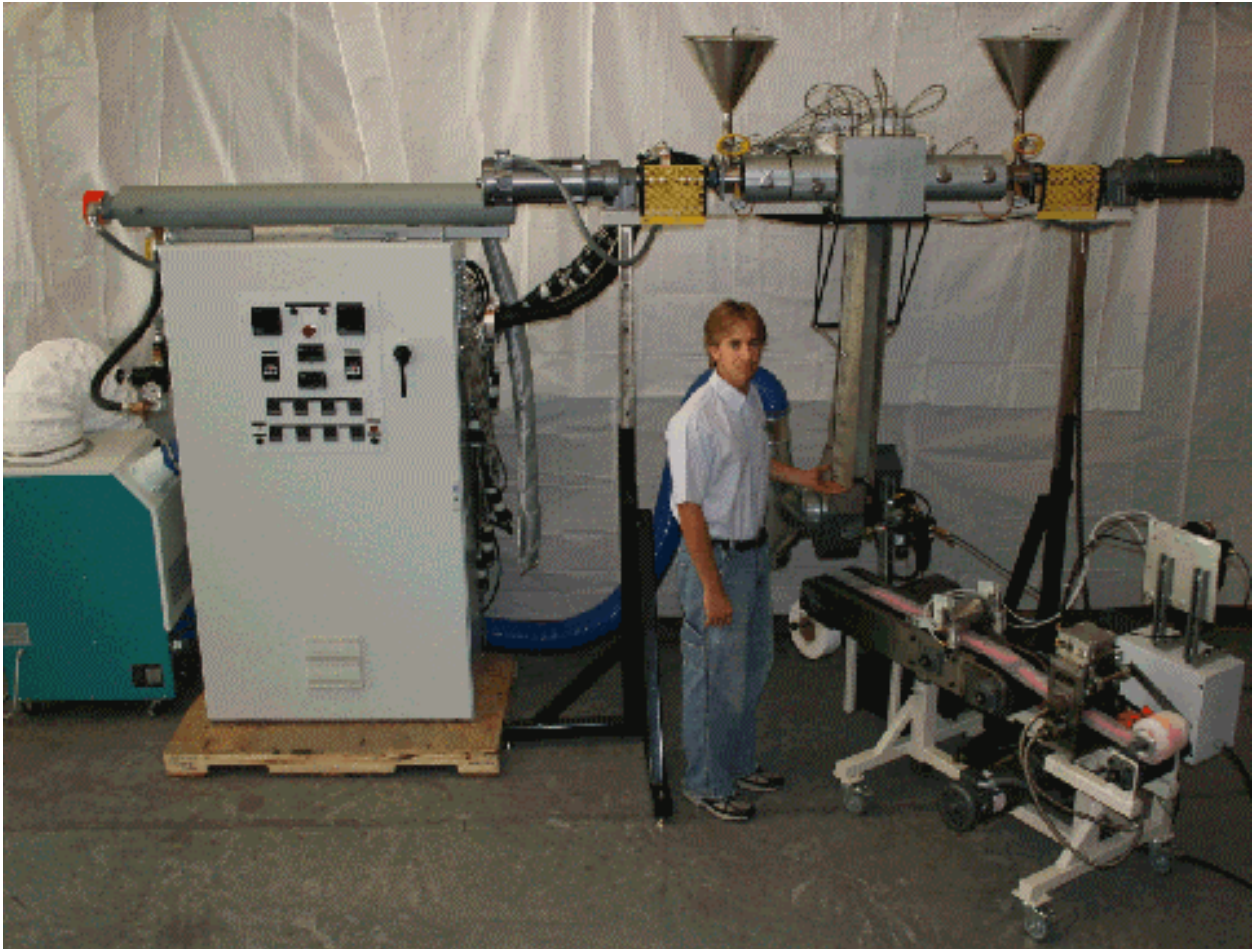
105" ceiling height required

Floor Plan LBS machine w/ forming table & chiller

Fiber Arrangement



Spunbond arrangement



Meltblown arrangement



A hydraulic jack is provided to easily change the spinneret height.

