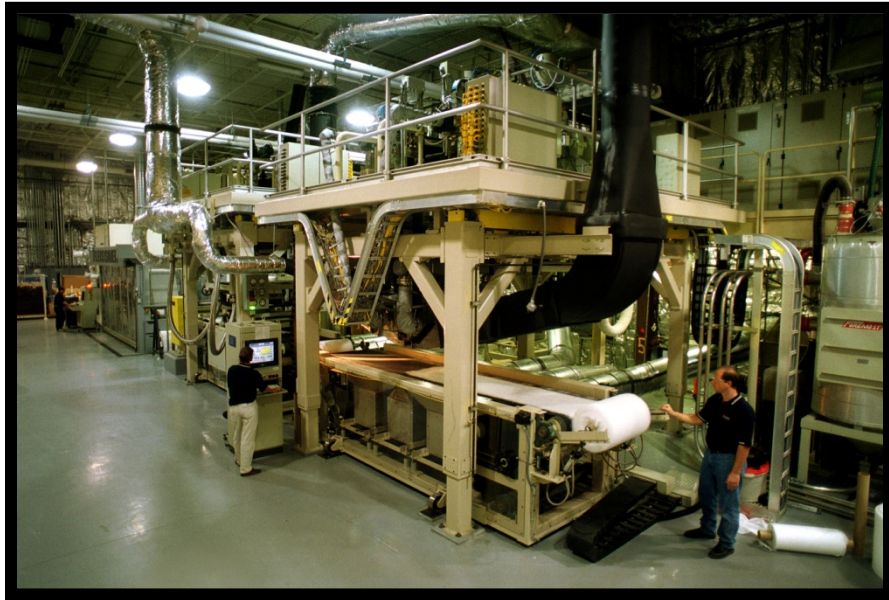


The Nonwovens Institute Partners' SpunMelt & Hydro Laboratory

The Nonwovens Institute at North Carolina State University has created a state-of-the-art Melt Spinning & Hydroentangling facility on the Centennial Campus in Raleigh, NC. This Multi-Purpose installation incorporates commercial technologies from Nordson Fiber Systems (NFS) and Hills Inc. The 560-mm wide line includes single-beam bicomponent Spunbond that can be calender bonded at production speeds and throughputs using diamond embossed or smooth calender pattern. The Spunbond system is capable of spinning bicomponent fibers in sheath/core, side-by-side, segmented pie, islands in the sea (up to 360 islands) and tipped trilobal configurations.

The Partners' Lab has the capability to bypass the calender altogether and bond the newly created fibrous webs solely by hydroentangling. Hydroentanglement bonding takes place on a state-of-the-art commercial Aquajet line from Fleissner, Inc. The 600-mm wide line includes a belt and drum backside entangling process with 5 high pressure manifolds. Hydroentangling pressures up to 230 bar (3330 psi) are available. Belts of different construction (weave, mesh) are used to optimize the hydroentangling process and achieve desired fabric properties. In addition to interchangeable belts, fitted belts can be placed on the hydroentangling drum to optimize fabric performance and appearance. A Fleissner through-air dryer/bonder is included. A.Celli has supplied the Windy winder for the operation.



PARTNERS' LAB EQUIPMENT CAPABILITIES

Nordson Fiber Systems/Hills Inc. Bicomponent Spunbonding System

Extruders	"A" – 75.0 mm (2.95") 24:1 extruder "B" – 63.5 mm (2.5") 24:1 extruder
Melt Pumps	"A" – 60 rpm max @ 60 cc/rev "B" – 60 rpm max @ 40 cc/rev
Minimum Throughput	"A" – 8.4 kg/hr (18.5 lbs/hr) "B" – 5.6 kg/hr (12.5 lbs/hr)
Maximum Throughput	"A" – 168 kg/hr (370 lbs/hr) "B" – 112 kg/hr (245 lbs/hr)
Temperature Ranges (Typical)	315° C (600° F) – Maximum 190° C (375° F) – Minimum
Bicomponent Ratios	Sheath/Core: 20/80 to 50/50 Other ratios can be achieved with additional pack parts
Bicomponent Configurations	Side by Side Sheath Core Eccentric Sheath Core Segmented Pie – 4-64 segments Tipped Trilobal Islands-in-the-Sea – up to 360 islands Others configurations possible with additional packs
Width - Forming Zone	56 cm (22 inches)
Number of Bicomponent Holes	4000 holes/meter - width (2222 holes)
Spinnerets Hole Shapes	Round Round-Hollow Trilobal
Diameter of Holes	0.35 mm (0.014") diameter
Capillary L/D Ratio	4:1
Denier Range	1.0 dpf to 4.0 dpf
Filters	Manual Filter Disk: 20 to 300 mesh as required
Throughput/Hole	0.4 g/h/min to 1.0 g/h/min (total, both extruders)
Web Weight Ranges (Typical)	15 g/m ² (0.44 oz/yd ²) to 200 g/m ² (5.9 oz/yd ²)
Belt Speed Ranges	10 m/min (11 yd/min) to 210 m/min (230 yd/min)
Calender Patterns	18% horizontal diamond & smooth
Quench Distance	Two sided, 2" fume exhaust 16" chilled quench
Spinning Distance	60 cm (23 inches) to 95 cm (37 inches)
Forming Distance	75 cm (30 inches) to 40 cm (16 inches)
Aspirator Velocities (Typical)	2,000 m/min (6,560 ft/min) to 8,000 m/min (26,250 ft/min)

Fleissner Aquajet 2000 Hydroentangling and Through Air Driver / Bonder System

Width	650 mm (25.5")
Entangling	Flat belt with Compaction drum
Manifolds	5 high-pressure manifolds ~ 250 bar (3600 PSI) rating
Orifice Strips	130 microns 16 holes/cm (40 holes/inch) Nippon Nozzle 316 SS Single row and Double row (Others available)
Filtration	Graduated Sand and Bag
Belt Patterns	10 square 14 square 36 square 46 x 36 (Formtech 100) 61 mesh 82 mesh RibTech 100 mesh SS 103 mesh Others available
Drum Patterns	10 square 100 mesh SS
Dryer	Omega design Gas Fired 220 C (425 F) max temp. Squeeze roll
Weight Ranges (Typical)	30 g/m ² (0.9 oz/yd ²) to 300 g/m ² (5.9 oz/yd ²)
Speed Ranges	10 m/min (11 yd/min) to 400 m/min (440 yd/min)

To learn more about our capabilities, please contact us by email
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