

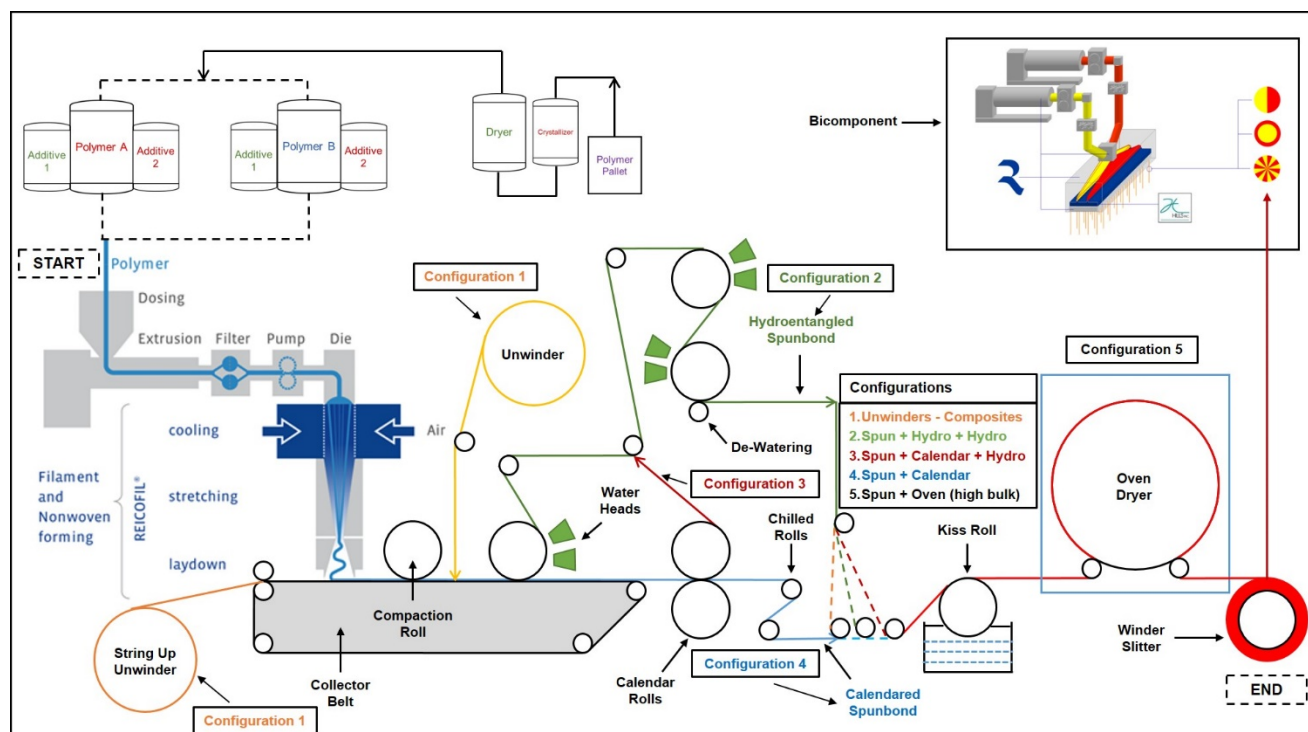
# The Nonwovens Institute: Advanced SpunMelt & Hydroentangling Facility

A New Advanced SpunMelt and Hydroentangling Pilot Facility will open April 2017 at The Nonwovens Institute (NWI), on NC State University's Centennial Campus in Raleigh.

Built with flexibility in mind, the facility represents a combination of advanced state-of-the-art technologies to provide a unique test bed for education and industry.

It houses a **Reicofil® 4 1.0-meter-wide bicomponent spunbond line** together with additional equipment from supporting partners - including **Hills** bico or mono filament die packs, two unwinds, an **Andritz** thermobonding calendar, two **Perfojet** hydroentanglement units, a kiss roll, a through air dryer, and a high speed **A. Celli** winder and slitter.

The web path can be customized to enable your specific requirements. Thus, the web proceeds from spunbond laydown, to a compaction roll, and then to a series of options including: two in-line unwinds to combine with other webs (e.g., cellulosics, nonwovens), a first pre-hydroentanglement unit (2 nozzles), a thermal calendar (includes roll options for 3 bond patterns and a smooth roll), to a second (main) hydroentanglement unit (4 nozzles), to the Kiss Roll unit, and the through air dryer. Finally, the web path concludes with winding and slitting.



**Dedicated to research, development, and incubation** this facility enables experimental learning, prototype making, and the production of nonwoven. We can provide measurements of basis weight, thickness, air perm, and tensile strength as needed for the trials. Arrangements for special or more comprehensive testing can be made through our adjacent NWI analytical facilities. The experienced NWI team of engineers will contribute to the planning and execution of your trials.

Additional discussion & detailed specifications are provided on the back of this page.

[www.TheNonwovensInstitute.com](http://www.TheNonwovensInstitute.com)

## New Advanced Spunmelt and Hydroentangling Facility Specifications

**We can run trials in many different configurations**, such as single beam spunbond with 6800 or 5800 capillaries per meter, and with either sheath-core bico, side-by-side bico, or homofilament. Future more complex cross sections (e.g., segmented pie, islands-in-the-sea) will be possible with a 3673 capillary per meter beam. Resin options include PP, PE and PET. Many other materials are possible to run, e.g., including Nylon, PLA. Polymer handling includes the option of two dryers and two crystallizers. The first hydroentangling unit has one drum with two entangling manifolds, while the second has two drums each with two entangling manifolds (capable to 250 bar each).

**Calendar roll embossing patterns are available to address a range of product applications and basis weights.** Initially, three pattern rolls (12.1% dot, 18.1% elliptical, & 19.9% square bond area) are available, along with a smooth roll that can be engraved for a period with your preferred pattern.

### Reicofil® 4/Hills Inc. Bicomponent Spunbond Line

Extruders	"A" – 120.0 mm (4.72"), Single Flight – 30 D "B" – 80.0 mm (3.15"), Single Flight – 30 D
Resins	PP, PE, & PET Other resins also possible with qualification
Resin Crystallizer & Dryer Units	Unit 1: max throughput of 600 kg/hr Unit 2: max throughput of 300 kg/hr
Resin Feeding (2 dosing units)	Unit 1: 3-component dosing, 500 kg/hr output Unit 2: 3-component dosing, 300 kg/hr output
Filament Spinning Speed	Up to 4500 m/min
Throughput	PP: 270 kg/hr/m (595.25 lbs/hr/m) PET: 400 kg/hr/m (881.85 lbs/hr/m)
Bicomponent Ratios	50/50 to 90/10
Fiber Designs (initial)	Sheath-Core & Side-by-Side bicos, & mono
Spinning & Web Width	1060 mm (41.73 inches)
Number of Bicomponent Holes (holes per meter)	6800 or 5800 for sheath:core, side-by-side 3673 for future complex structures, e.g., islands-in-sea, segmented pie.
Spinnerets Hole Shapes	Round (initial), Trilobal
Diameter of Holes	0.6 mm
Capillary L/D Ratio	4:1
Denier Range	1.0-3.0 dpf & 2.0- 5.0 dpf, for PP & PET
Filters	After extruder and in spin pack, mesh as required.
Throughput/Hole	0.4 - 1.2 g/hole/min
Web Weight Ranges (Typical)	10 – 100 gsm
Belt Speed Ranges	1-400 m/min
Calendar Patterns	19.87% bond area diamond/square 18.1% bond area elliptical 12.1% bond area, round Smooth roll that can be engraved w/ pattern
Possible Line Configurations	1-Two unwinders included to make composites 2-Spun+Hydro+Hydro (for flexible structure) 3-Spun+Calendar+Hydro (soft thermal bonded) 4-Spun+Calendar (for thermally bonded web) 5-Spun+Oven (high bulk thermal bonded) 6-Water filtration for pulp/cellulose processing

### Andritz Hydroentangling & Through Air Dryer / Bonding System

Width	1100 mm
Manifolds	6 Total on 3 drums
Orifice Strips	1015 width 5230 Capillaries 135 microns
Filtration	Sand and flotation cell
Dryer	Gas fired omega up to 260C
Weight Ranges (Typical)	50-200 gsm
Speed Ranges	1-400 m/min

### Full Process Reports Provided

Process Reports	Reports include full line parameters and data capture for each sample (hard copy, csv, or pdf).
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To learn more about our capabilities, please contact us by email at [nonwovens@ncsu.edu](mailto:nonwovens@ncsu.edu) or visit our website [www.TheNonwovensInstitute.com](http://www.TheNonwovensInstitute.com)