Binghamton University's Center for Advanced Microelectronics Manufacturing helps to demonstrate the feasibility of roll-to-roll (R2R) electronics manufacturing with its prototype tools and by establishing processes that produce low-volume test-bed products.

The R2R manufacturing process, one step at a time, as seen at the center:

1 A roll of new material arrives and is inspected for surface particulates, scratches or other imperfections.

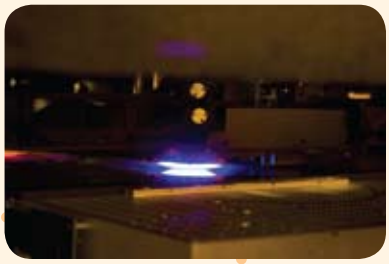
2 The material is cleaned.

3 The roll is inspected again to verify the cleaning process.

4 The roll goes to the General Vacuum tool for metallization. The machine precleans (or "wets") the surface just before coating to improve the adhesion of the metal.

5 In the resist-apply phase, a photoresist material is applied with a spray system or through a slot-die wet coating. *(This step is the only one performed off site.)*

6 Now there's an ultraviolet-sensitive roll of material ready to be exposed, much like a roll of film. The material goes through a projection lithography system, which can expose up to 24 linear inches per minute of web.



7 The material goes through a developer and is rinsed and dried.

8 The material is etched, removing the exposed metal that's not needed.

9 A stripping process removes the remaining photoresist material.

10 The metal-patterned roll of material is ready. Possible applications include smart fabrics, sensors and medical devices as well as consumer electronics.

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