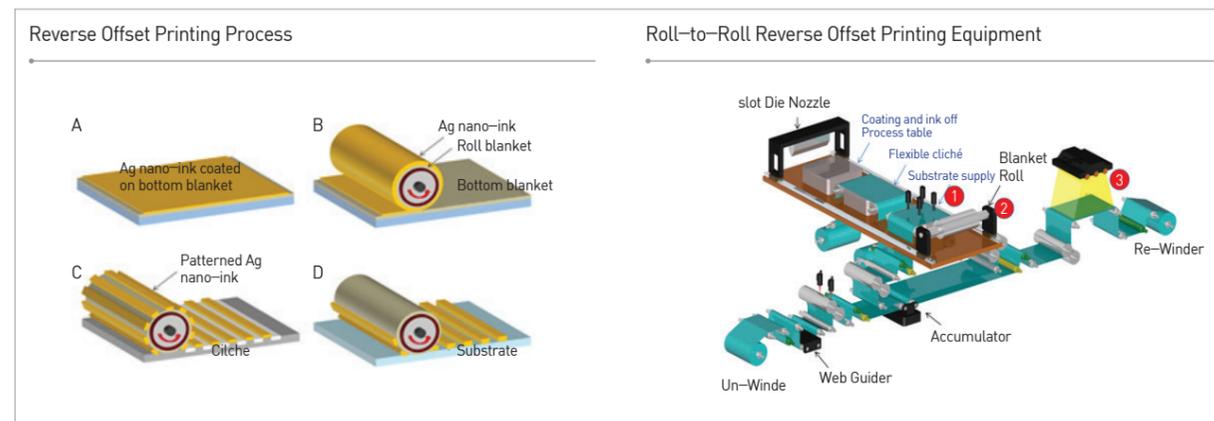


Precise Roll-to-Roll Reverse Offset Printing Technology

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⇒ Manufacturing technology for ultrafine conductive pattern on film transferred in roll-to-roll with the step & repeat method



Client / Market

- Next generation flexible TFT backplane requiring high precision conductive pattern on plastic film (utilized as next generation flexible display, photo detector and sensor)

Necessity of this Technology

- Today's roll-to-roll patterning technology fails to satisfy the market demand and expectations on new electronic devices like flexible display and sensor, and demand for reliable roll-to-roll patterning technology development for quick commercialization continues.
- Due to such technical limitations, display manufacturers such as Samsung and LG are executing mass production by manufacturing flexible displays on plastic film-coated glass substrate and then peeling off the plastic film. However, such additional process leads to loss in process cost.
- Current roll-to-roll printing technology can only form relatively a simple circuit and has weak electrical properties. With low reliability, its market entry is limited.
- There is a need for a precision patterning technology for roll-to-roll, low-cost mass production of large, complex structures that the flexible display and other markets demand.

Technical Differentiation

- Possible to create ultrafine patterns (below 3 μm) on large area roll-to-roll films (width over 200 mm)
- Reverse offset process uses 100% ink transfer process that the pattern thickness is consistent, and the pattern quality including line edge roughness (LER) is outstanding.
- By precisely calculating the position of patterns on the plate/substrate before printing and the registration error of patterns after printing, the print registration error is automatically corrected to realize precise registration on roll-to-roll film with width of 200 mm resulting in error less than 5 μm.
- Technology to minimize thermal contraction of plastic film during heat treatment following printing and registration precision control technology for autocorrection have been developed.
- The technology also can be utilized for roll-to-roll production of protection film requiring precise registration of lens and pattern

DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

Other

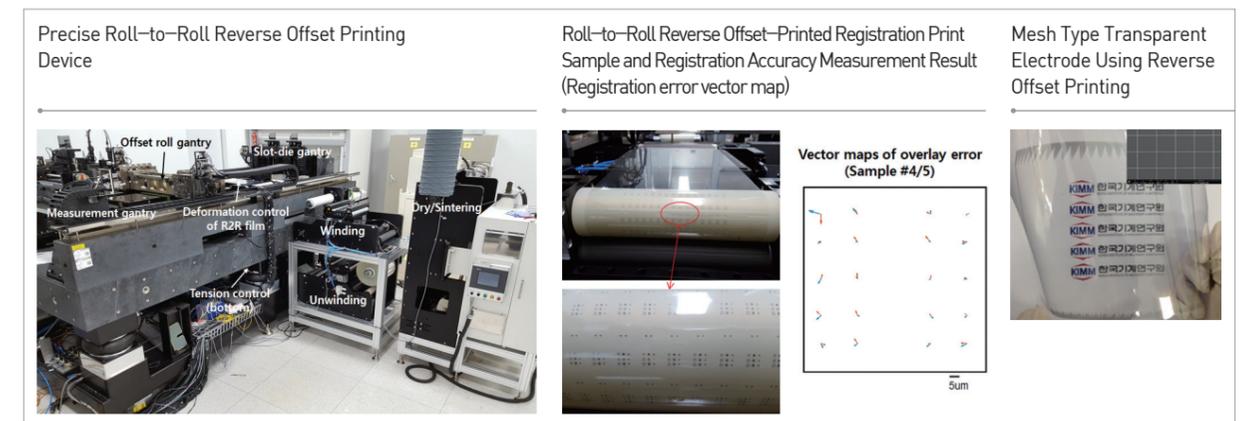


TECHNOLOGY READINESS LEVEL [TRL]

Research, basic explanation | Project concept or idea development | Technology idea verification | Prototype development | Trial product production/evaluation in similar environment | Pilot field demonstration | Development and optimization of commercial model | Commercial product demonstration | Mass production and initial market launch

Excellence of Technology

- Transparent electrode making through forming 3 μm mesh patterns on large plastic film
- Development of precise roll-to-roll reverse offset device realizing auto measurement/correction of registration position error; verified registration accuracy function



Current Intellectual Property Right Status

PATENT

- Printing Device for Synchronization Error Measurement and Correction and the Method (KR1445064, US9421753)
- Printing Device for Synchronization Error Correction (KR1445065)
- Printing Apparatus and Method Being Available to Measure and Compensate Synchronization Error Using Motor Feedback Signal (KR1519843)
- Printing Location Accuracy Correction Method (KR1527721)
- Reverse Offset Printing Method of Partial Off Type (KR1211992, US8820239, JP5500743)
- Roll-to-Roll Reverse Offset Printing Device and its Alignment Method (KR2015-0018418, registration approved)

KNOW-HOW

- Precise reverse offset printing process and conductive ink making technology
- Registration error's precise measurement/analysis and registration error autocorrection S/W technology