

MICROGRAVURE™

US Patents D355,669 & D346,397

APPLICATIONS:

OLED Displays
Printed Electronics
Renewable Energy
Window Films
Photonics
and more!



US BRANCH

Yasui Seiki - MIRWEC Coating

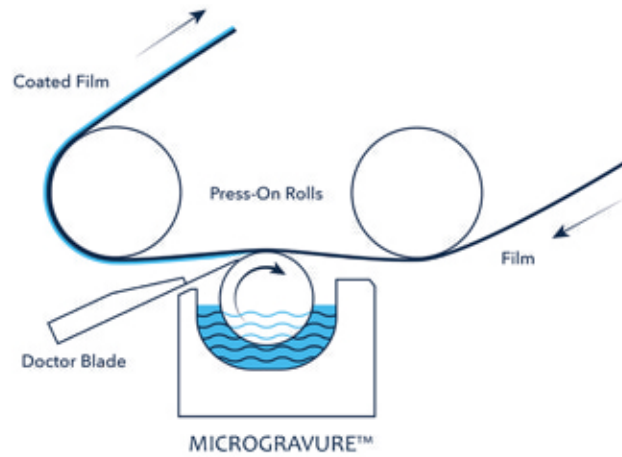
601 S. Liberty Dr.
Bloomington, IN 47403
(812)331-7194
sales@yasuiseiki.com

www.yasuiseiki.com



MICROGRAVURE™

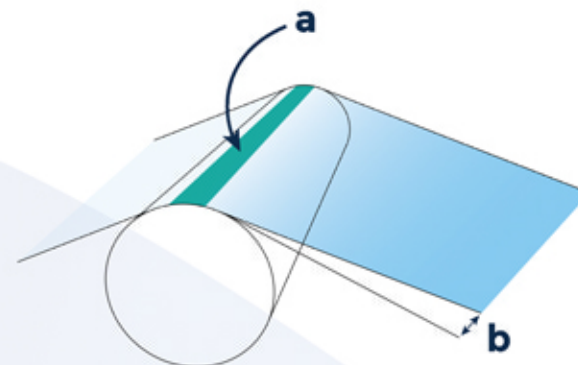
WHAT IS MICROGRAVURE™?



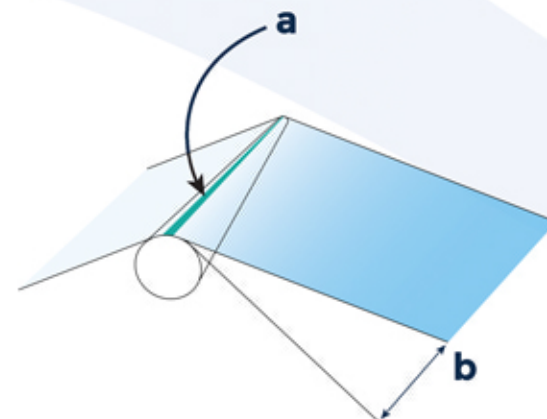
MICROGRAVURE™ uses a smaller diameter gravure roll engraved with patterns or cells to provide a specific coating volume. It is used in a reverse kiss coating method in which the roll is partially submerged in a pan of solution. The roll rotates in the opposite direction of the web, and the cells pick up the coating solution. The flexible doctor blade lightly smooths off the excess and the precisely measured solution in the cells is then transferred to the web.

WHY IS MICROGRAVURE™ BETTER THAN REGULAR GRAVURE?

- The smaller diameter provides a much smaller contact area (a), which allows for an exceptionally stable bead of solution that is critical for thin, uniform, and glossy coatings
- The larger web-to-roller distance (b) minimizes streaks and offers cleaner lines
- No backing roll
 - No creasing
 - Smaller contact area
 - Prevents spillover to the other side
- Can coat low-viscosity solutions
- Lightweight cylinder means faster and easier changeover
- Reverse coating creates shearing, which results in a smoother surface



Regular Gravure



MICROGRAVURE™

WHAT CAN MICROGRAVURE™ DO?

- Coats 1 to 80 microns wet, as thin as 5 nanometers dry
- Coats low viscosity solutions (0-1000 cP), both aqueous and solvent based
- Coats on thin substrates such as PET, PC, PP, aluminum, copper, stainless steel, paper, and fabric
Example: as thin as 3 μm PET and as thick as 750 μm PC
- Offers exceptional uniformity: $\pm 2\%$ tolerance
Example: 0.5% tolerance on 8 μm dry coating (300 mm wide, 100 m long test)

APPLICATION EXAMPLES

OPTICAL

- 0.05 to 0.15 μm AR/LR coating on optical films
- 2 to 3 μm hard coating on optical films
- 14 μm photoresist coating for hologram application

BATTERIES

- 0.5 to 1 μm carbon nanotube coating on aluminum foils
- 2 to 4 μm insulation coating on porous separator films
- 2 to 5 μm reflective coating for solar cells

PRINTED ELECTRONICS

- 0.3 to 2 μm silicone coating on PET
- 1 to 3 μm photoresist coating on PET

FACT: A majority of smartphones and tablets sold in the US contain at least one layer coated by a Yasui Seiki MICROGRAVURE™ coating system.