Instrumental Technique: Electrode coater (DOCTOR BLADE)

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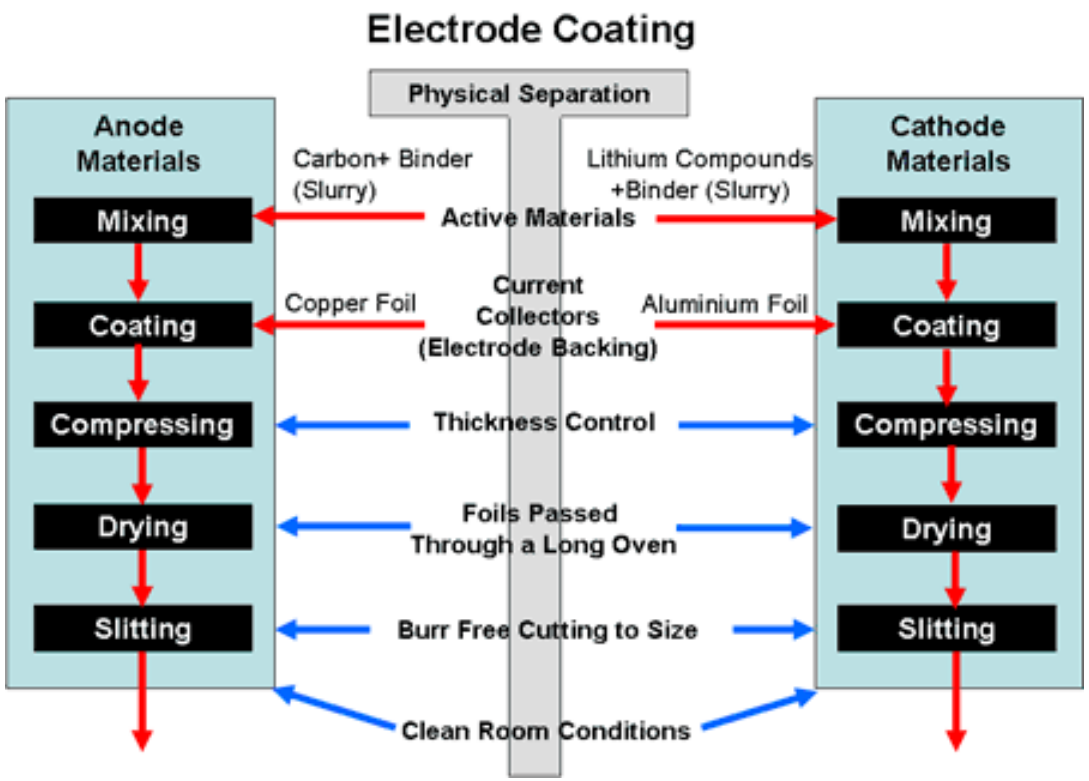
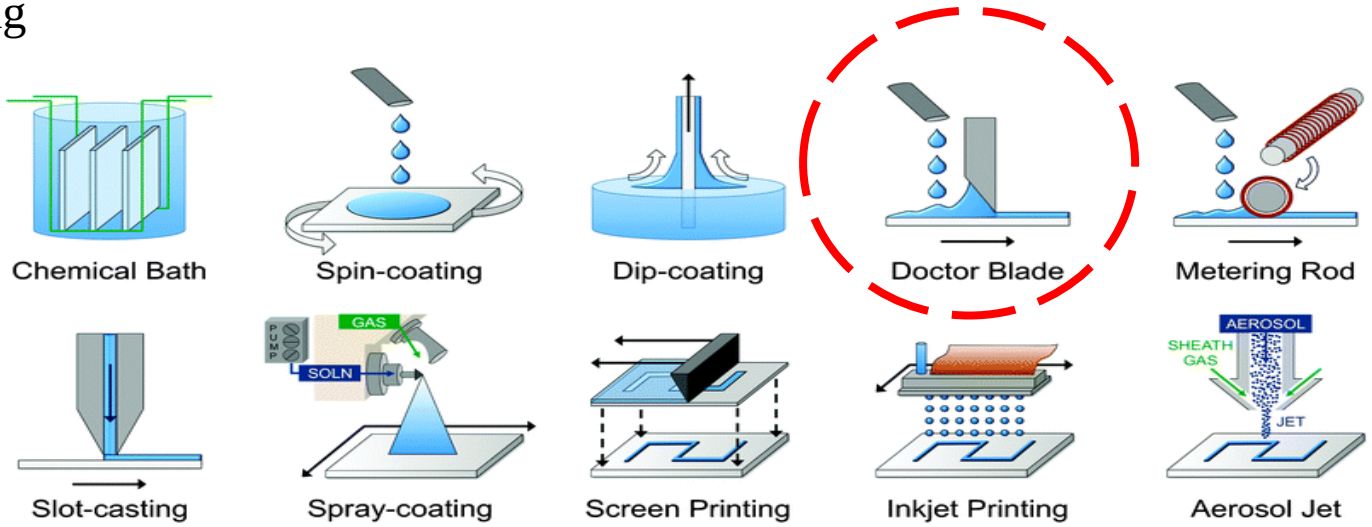


Type of coating

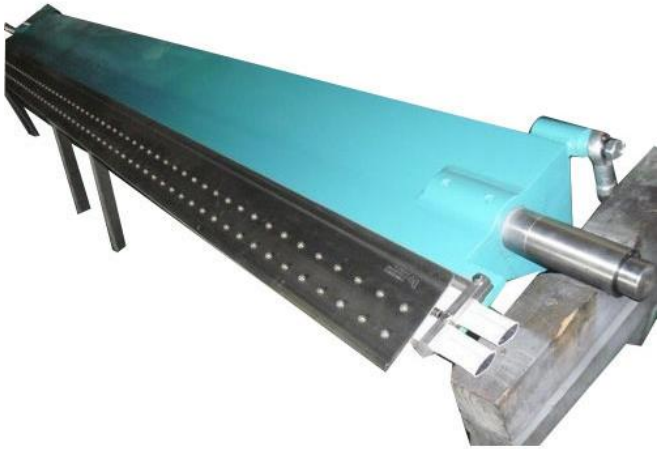


What is a Doctor Blade ?

- Doctor Blades are actually an essential part of commercial printing. While there are many methods of printing, there are two predominant methods that use Doctor Blades. They are called Rotogravure (gravure), and Flexographic (flexo) printing. In both Gravure and Flexo printing, the doctor blade is technically a metering blade.

- The word doctor is thought to come from German roots, where it was first called a “ductor blade”, meaning to draw across a surface. The doctor blade meters (controls) the amount of liquid ink that is deposited on a printing cylinder. It does this by wiping the cylinder surface of excess ink while the cylinder rotates in an ink supply. While gravure and flexo are totally different processes, the blade meters the ink in both.

- Steel blades can range from .004” (0.10mm) to .010” (0.25mm) in thickness. They can also have special shapes to fit the application.

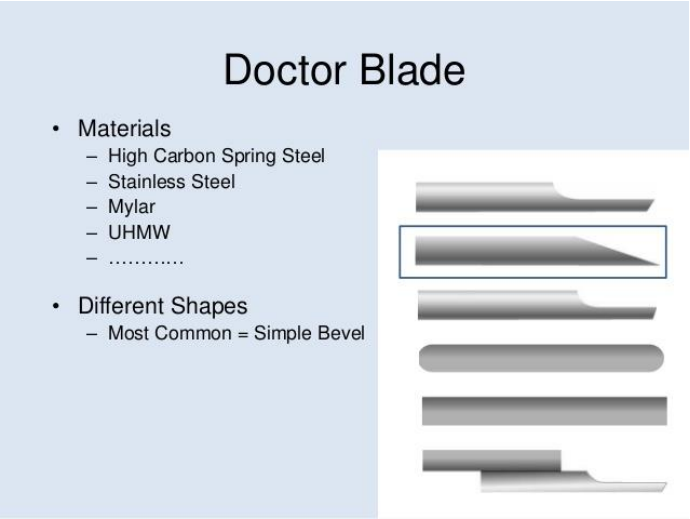


History of Doctor Blade:

Doctor blade (or tape casting) is one of the widely used techniques for producing thin films on large area surfaces. Tape casting is a relatively new process which was originally developed during the 1940's as a method of forming thin sheets of piezoelectric materials and capacitors and is now an accepted precision coating method.

Doctor blades are also used in other printing and coating processes, such as flexo and pad printing for the same function.

It is believed that the name derives from the blades used in flatbed letterpress equipment for blades used to **wipe ductor rolls, and "ductor" became doctor.**

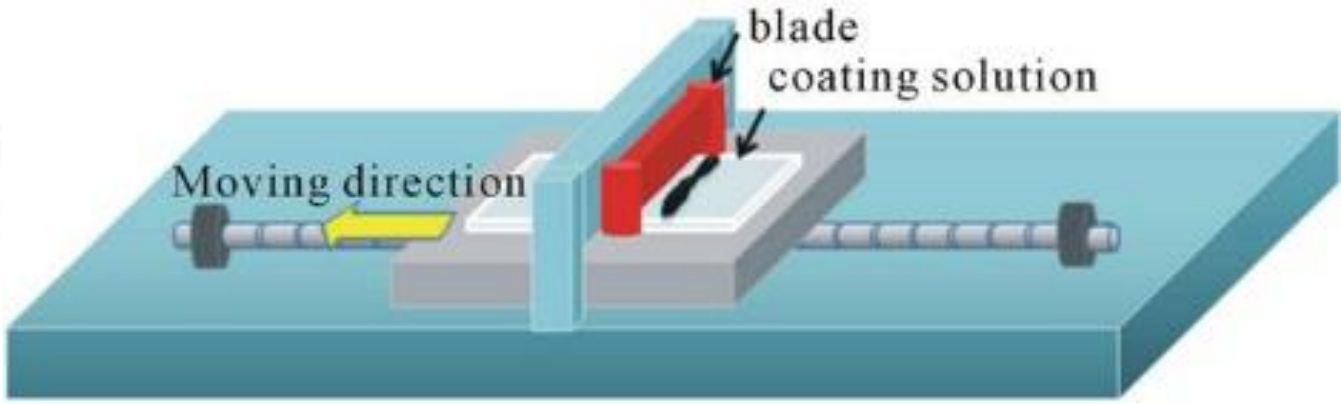


A technician installs a doctor blade for flexographic printing.

Mann, George (1952), Print: A Manual for Librarians and Students Describing in Detail the History, Methods, and Applications of Printing and Paper Making, London: Grafton, p. 62, OCLC 3331032

Working Principle:

In the doctor blading process, a well-mixed slurry consisting of a suspension of ceramic particles along with other additives (such as binders, dispersants or plasticizers) is placed on a substrate beyond the doctor blade. When a constant relative movement is established between the blade and the substrate, the slurry spreads on the substrate to form a thin sheet which results in a gel-layer upon drying. The doctor blading can operate at speed up to several meters per minute and it is suitable to coat substrate with a very wide range of wet film thicknesses ranging from 20 to several hundred microns.



Application:

- The spiral film applicator is mostly used for coating foils, leather, textiles and fuel cell industry or other flexible materials with uneven surfaces.
- By using the spiral film applicator, the underlaying substrate is pressed down and flattened and electrode industry.
- It is used basically for making thin film.

Advantage:

- It gives precise and very good quality thin film coating.
- Of necessity, the doctor blade must be easy and quick to replace. On many machines, the doctor blade holder is easily removable from the machine and the replacement of a doctor blade is done by removing the blade holder from the machine; discarding the old blade; inserting the new blade; and then replacing the blade holder + new blade in the machine.

Thank You