Overview

Spin coating has been used for several decades for the application of thin films. Spin coating is a procedure used to apply uniform thin films to flat substrates. An excess amount of a solution is placed on the substrate, which is then rotated at high speed in order to spread the fluid by centrifugal force. A machine used for spin coating is called a spin coater, or simply spinner.

Rotation is continued while the fluid spins off the edges of the substrate, until the desired thickness of the film is achieved. The applied solvent is usually volatile, and simultaneously evaporates. So, the higher the angular speed of spinning, the thinner the film. The thickness of the film also depends on the concentration of the solution and the solvent. Figure 1 shows steps of spincoating. Part a. shows dispensing liquid on the surface of substrate. In part b. the substrate accelerates from starting to desired speed then will spin on the constant speed as part c. to decrease film layer and evaporate the solvent.

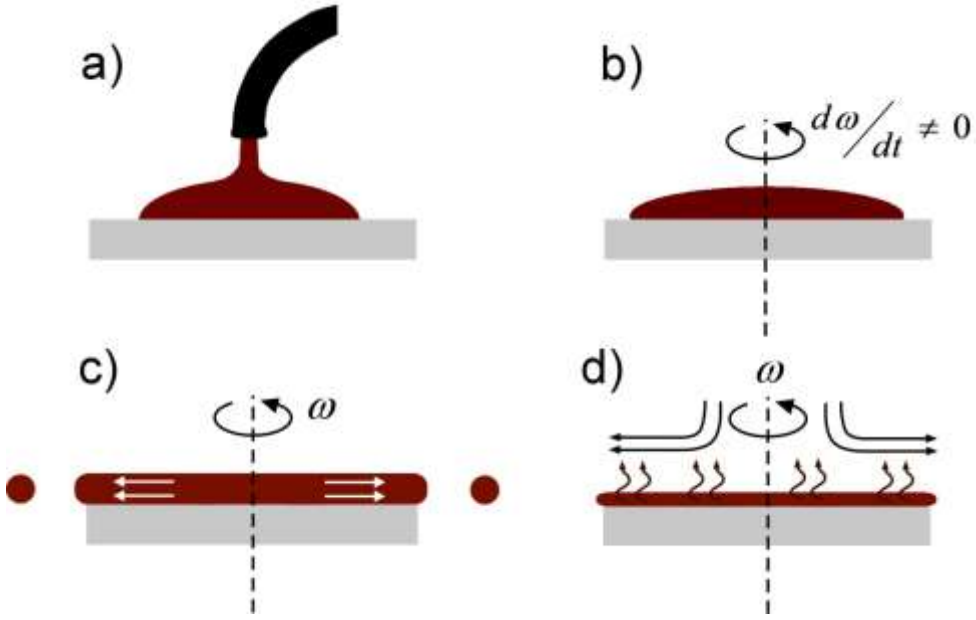

Fig.1.

Spin coating is widely used in micro fabrication, where it can be used to create thin films with thicknesses below 10 nm. It is used intensively in photolithography, to deposit layers of photoresist about 1 micro meter thick. Final film thickness and other properties will depend on the nature of the resin (viscosity, drying rate, percent solids, surface tension, etc.) and the parameters chosen for the spin process. Factors such as final rotational speed, acceleration contribute to how the properties of coated films are defined. Our spin coaters are compact with advanced features. The maximum rotational speed is 10,000 RPM. SC-4xx can be programmed in 9 stages. Their minimum rise time to reach the defined speed is 5 second. The speed is controlled very accurately during the spinning by advanced controlled methods. They have user friendly software that can be used to control the spinning process by a computer or their processor.

During coating process substrate is held by vacuum pump. VMC409's user friendly software has made it possible to perform up to 10 different steps, in each step desired time, speed and ramp and be programmed. Coating process can be static or dynamic. In Static procedure firstly the substrate is covered by the solution and after that it starts to spin. Contrary in Dynamic method the solution is applied continuously as the substrate is rotating. Thanks to the flow valves, mounted on the cap, the user is able to perform whole coating process in any desired atmosphere (i.e. dry inert gases, N2). Also solvent saturated atmosphere is applicable.

The SC-4xx Spin Coater Series enables R&D and university laboratories around the world to efficiently and accurately develop and refine coating applications either water or organic solvent based. Available in programmable models, the SC-4xx features proprietary circuitry and user-friendly operation that allow for the uniform application of photoresists, polyimides, metal-organics, dopants, silica films and most organic and aqueous solutions to planar substrates.

Combining precise control with flexibility, they're perfect for a range of applications. Spin Coaters are available in different configurations, each designed and manufactured to provide laboratories with a highly efficient and accurate means of applying uniform coatings. Our spin coating line also includes optional accessories to support the varying needs found in a laboratory environment and all are backed by and its years of experience in coating research and development.

System Features

- Precise control of spin speed and acceleration/deceleration rates
- Easy-to-use keypad and LCD display on the front panel
- Clear cover features a dispensing slot
- Programmable models (4-inch) can store and execute up to 10 recipes with 9 steps each
- Compact enclosure size
- Available with four to six-inch bowls
- Fast, simple programming by means of microprocessor-based control
- Close loop servomotor for precise speed regulation
- USB port for external control using optional PC interface software for programming, profile storage, diagnostics.
- Programmable models can store and execute up to 10 programs in manual mode and many other programs depend on memory of the PC (unlimited w/ optional software)
- Spin profiles adjustable in 1.0 rpm rotation increments, 1 second timing increments, and 1.0 second increments for dwell time.
- Precise repeatability from cycle to cycle

- Chemically resistant Teflon coated bowl
- Safety glass window
- External vacuum pump
- Software for external programming and unlimited recipe storage

PC interface software
Manual dispense Automated dispense

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Chucks

Company offers several chucks for use in our SCS Spin Coaters. Our chucks are machined to close tolerances and provide an exceptionally flat, rigid surface for mounting substrates of different sizes, weights, and shapes. Company can also provide custom chucks depending on your application.

Vacuum chucks are available in stainless steel, hard anodized aluminum and PTFE. Be sure to specify the material of choice and chuck size when ordering.

Type CS : Flat Surface Cross and Scroll
Used to hold a thin, planar substrate such as silicon, glass or germanium on a spinning shaft for maximum rotational speed. Has cross and scroll design.

Type H: O-Ring Vacuum-Holding
Used to hold relative heavy substrates, such as glass, quartz, ceramic and metal. Features O-ring vacuum seal.

Type L: O-Ring Vacuum-Holding
With Mechanical Locating Fingers Designed for heavy, large or unsymmetrical substrates. Guide fingers assist in positioning and holding substrates. Also includes an O-ring vacuum seal.

SPECIFICATION

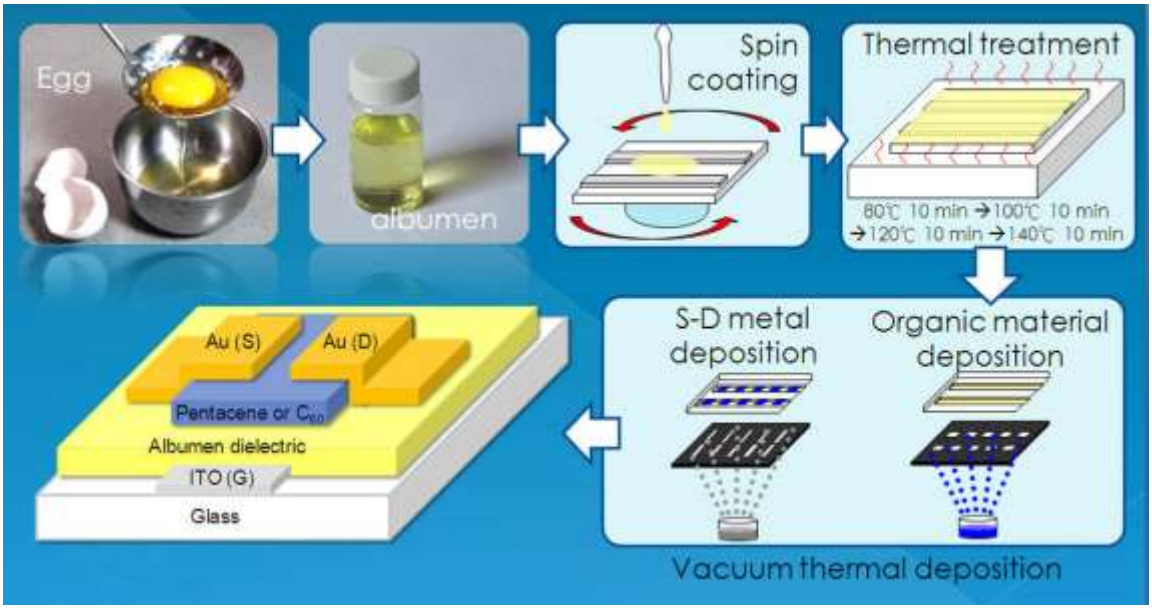
BOWL SIZE	4 in. and 6 in. / 10 and 15cm
ROTATIONAL SPEED	0 to 9,999 RPM in 1 RPM increments
ACCELERATION	0.1 to 30 seconds in 0.1 second increments
STEP'S TIME	0 to 59' 59" in 1 second increments
POWER	110/240 VAC, 50/60Hz, 1Ø
DIMENSIONS	9.45 x 9.05 x 10.63 in / 24 x 23 x 27 cm
POWER INPUT	115/230 VAC, 50/60 Hz, 1Ø
VACUUM INPUT	Minimum 17 in Hg / 430 mm Hg; O.D. fitting: 0.25 in / 0.635 mm
PURGE INPUT	0.55 CFM at 5 psi / 14.15 CLM at 0.35 kg/cm2 air or nitrogen(with optional internal vacuum: 2.2CFM, 60 psi)

Fields Of Application

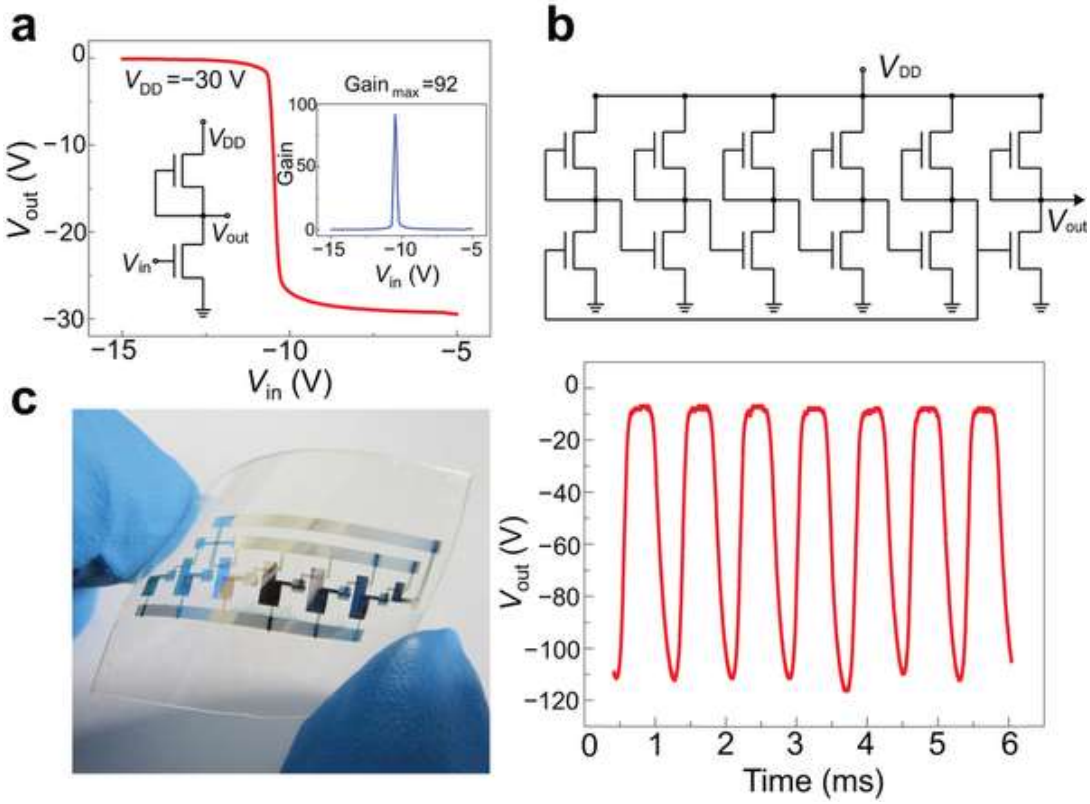
- Photoresist for defining patterns in microcircuit fabrication.

- Organic light emitting diodes

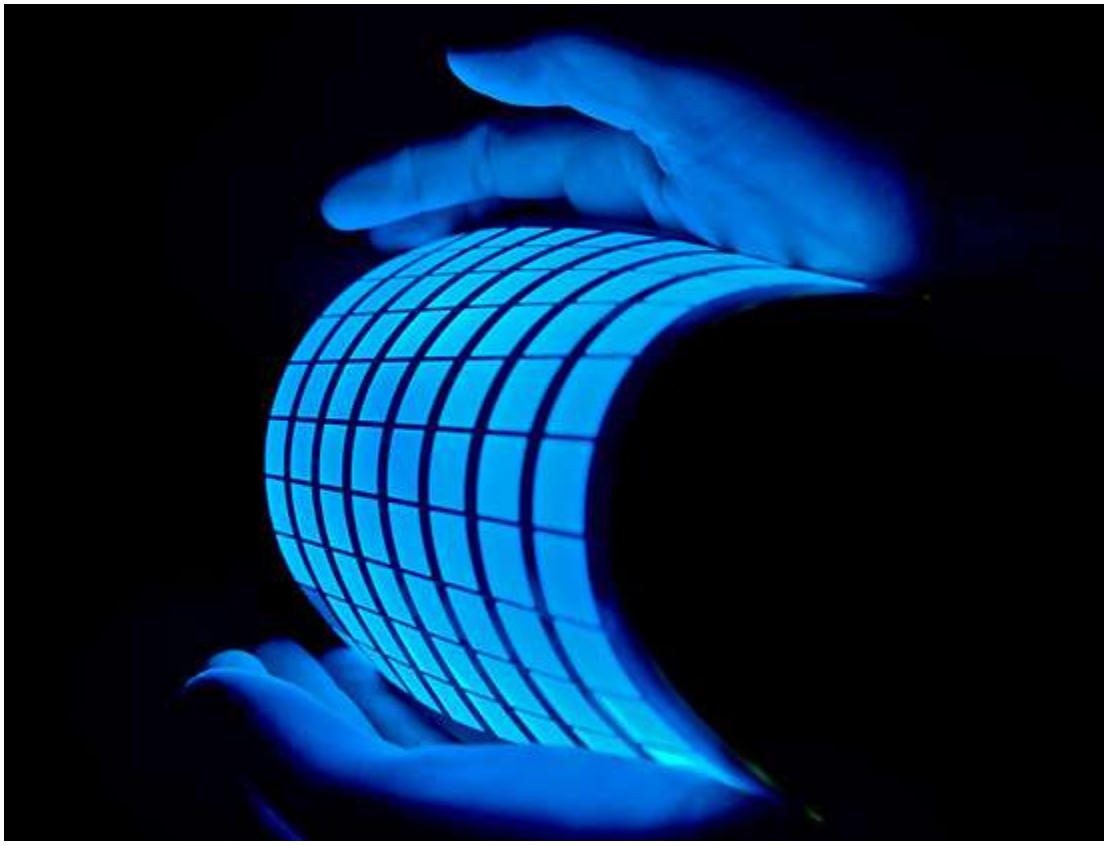
- Organic field effect transistors



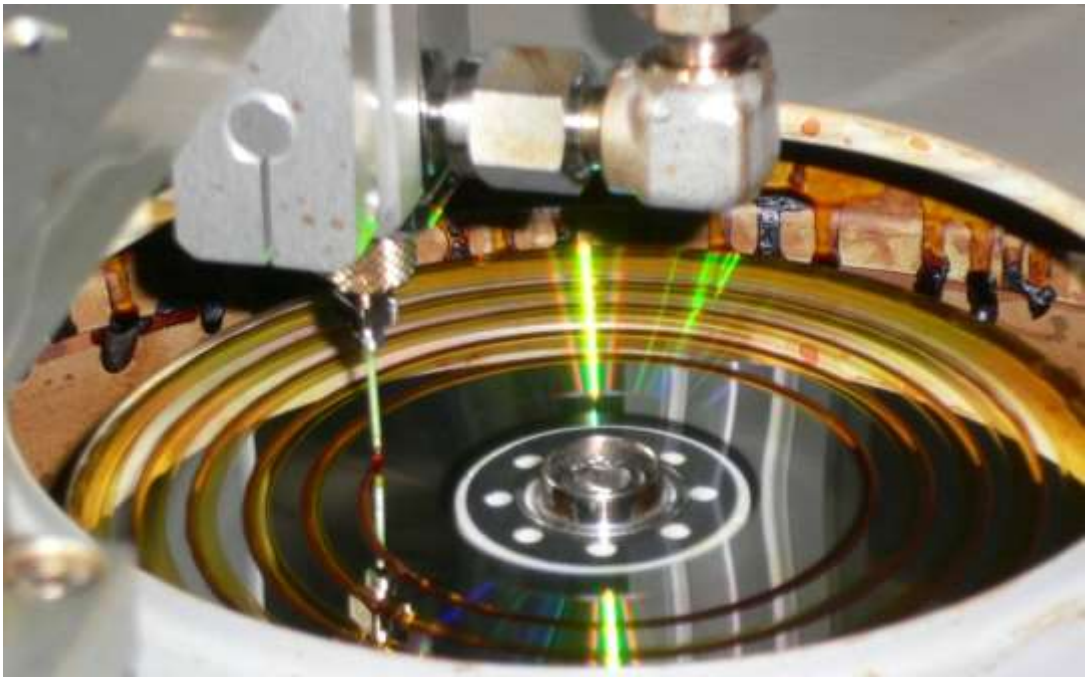
- Synthetic, Bio and Dielectric/insulating layers for microcircuit fabrication – polymers, SOG, SiLK, etc.



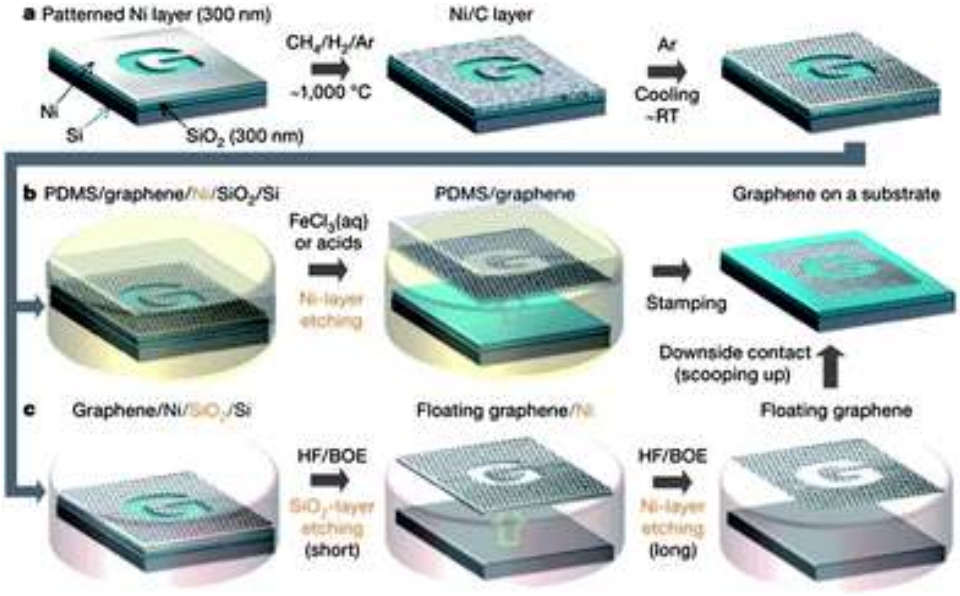
- Flat screen display coatings. - Antireflection coatings, conductive oxide, etc.



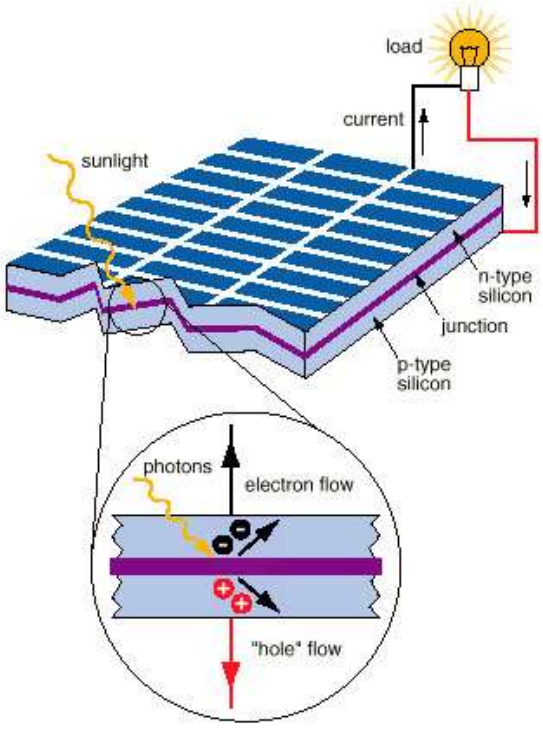
- Compact Disks – DVD, CD ROM, etc.



- Pattering and etching



- Solar cells, Hybrid organic, Inorganic devices



- Coloring
- Testing paint quality and evaporation rate
- Organics or chemicals
- Poly amid silica…
- Television tube phosphor and antireflection coatings
- Sol-gel
- Gas sensor, optical devices, organic Electronic
- Nano particles
- Magnetic disk coatings - magnetic particle suspensions, head lubricants, etc.