



Flat Sheet membrane manufacturing systems

About MEMS

MEMS is a subsidiary of Wellspring Expand, a spinoff company from PHILOS, a distinguished firm with over 20 years of experience in membrane production and system design.

Our in-depth knowledge of laboratory processes positions us to understand the challenges faced by researchers. We are dedicated to providing assistance to researchers, having closely observed and comprehended the psychology of those involved in membrane research. Recognizing that ease of use is paramount in research endeavors, we prioritize creating user-friendly solutions.

In our interactions with researchers, we've observed a tendency for individuals to choose poorly constructed, comfortable equipment over more functional alternatives. Despite possessing expensive systems, many researchers opt for simplicity due to ease of use. This observation led to the establishment of MEMS, where our focus is on supplying membrane researchers with convenient and user-friendly tools that adapt to their mindset. Our mission is to offer a device that aligns with the researcher's needs, leveraging our expertise and understanding of the challenges in membrane research.

Special feature of MEMS Flat Sheet Membrane manufacturing systems

With MEMS researchers no more have to worry about the tedious process of membrane making such as using spacer tape on a glass plate while casting the dope with a doctor's knife or even worry about inaccurate results obtained by following such process.

MEMS flat sheet membrane casting machine which comes with compact and user-friendly design to make your experiment easy and fruitful whilst ensuring the accuracy and reproducibility of every result. Furthermore, with MEMS continuous type flat sheet membrane casting device, researchers can avoid to spend a lot of time and money operating the device until the casting condition stabilizes, as you can use our systems in much affordable price whilst producing several samples in a short time.

MEMS provides simple system, but the best precision casting knife, support roll, and other control systems. Coating part is also comparable to the level of production facilities due to its high precision. The thickness of the membrane is also adjustable to the object, allowing you the flexibility to develop membrane with various factors.

Flat Sheet Membrane Manufacturing Process

MEMS supplies all sorts of facilities associated with the membrane manufacturing from the materials used to the manufacturing and evaluation systems. We provide you with an overall solution to membrane R&D.

Dope formulation ⇒ Membrane casting ⇒ TFC coating ⇒ Rinsing & drying ⇒ Spiral-wound element winding ⇒ Trimming ⇒ QC & evaluation

Flat sheet membrane casting system

Item	System	Specification
FCL	Lab Flat sheet membrane casting system	A4 Size casting Braid Doctor knife with thickness control by micrometer Casting speed 0.2~3 m/min Glass plate, non-temperature control 300L x 200W
FCS-330	Semi-continuous Flat sheet membrane casting system	330 mm width continuous casting Braid Doctor knife with thickness control by micrometer Casting speed 0.5~5 m/min Stainless steel 304, 88mmD casting roll, Temperature control RT~70°C with Heat exchanger 1600L x 700W x 1400H
FCS-500	Semi-continuous Flat sheet membrane casting system	500 mm width continuous casting Braid Doctor knife with thickness control by micrometer Casting speed 0.5~5 m/min Stainless steel 304, 88mmD casting roll, Temperature control RT~70°C with Heat exchanger 1600L x 900W x 1400H
FCC	Continuous Flat sheet membrane casting system	1,000 mm width continuous casting Braid Doctor knife with thickness control by micrometer Casting speed 0.5~3 m/min Stainless steel 304, 120mmD casting roll, Temp. control; RT ~ 60 ±3°C by direct heating (Direct heating with heater installed in the bath) Washing bath and Rewinder 4,100L x 1,800W x 1,500H



TFC (Thin Film Composite) membrane coating system

Secondary coating is generally performed to develop RO, FO and functional membrane. It is mainly formed by polyamide poly-condensation reaction on the surface of a base membrane. It is done either through gravure roll method or use a slot-die method depending upon the requirement and condition of the researcher. Generally, while making a polyamide TFC membrane, a membrane firstly has to go through dip-coating in amine solution and then react with acyl chloride solution, which usually takes much time and space to be ready. MEMS offered the best way to make TFC membrane using a very compact system. And, it usually is enough to produce a small scale spiral-wound element.

Item	System	Specification
FTD	Semi-continuous Flat sheet membrane dip-coating system	300mmW TFC coating by dipping process 1stCoating; dipping and SUS304 rolls and rubber mangle 2ndCoating; spray or dipping 3rdDry oven; drum type dryer(600mmD x 400mmW) convection type, RT~ 180 ±5°C Coating speed 1~5 m/min 2,200L x 1,100W x 1,900H
FTG	Semi-continuous Flat sheet membrane gravure-coating system	300mmW TFC coating by dipping process 1stCoating; gravure coating 2ndCoating; gravure coating 3rdDry oven; drum type dryer(600mmD x 400mmW) convection type, RT~ 180 ±5°C Coating speed 1~5 m/min 2,300L x 1,100W x 2,000H



Spiral-wound element manufacturing system

Item	System	Specification
SWS	Spiral-wound element rolling and trimming system (2521)	Element 1812, 2521 available model Winding speed control Unwinder/winder tension control 2,500mmL x 1,300mmW x 800 mmH
SWL	Spiral-wound element rolling and trimming system (4040)	Tricot (support textile) welding system, Max. 30 sheets Folding system, 1022 mm width membrane sheets accurate control by servo motor Rolling system, Max. 20 leaves winding, Max 4 inch D Trimming system, 250mmD rotating knife and speed control Wrapping system, winding speed 4~40 m/min

