



Hollow fiber 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 Hollow fiber membrane manufacturing systems

MEMS addresses a critical concern for researchers by simplifying experiments, particularly in the realm of cleaning. Our innovative MEMS hollow fiber spinning system is designed to alleviate the challenges associated with cleaning the dope tank, providing researchers with a worry-free solution. By incorporating disposable plastic bottles in the dope tank, users can easily replace them when working with new ingredients, streamlining the cleaning process and enhancing the overall experimental experience.

Furthermore, MEMS enhances researchers' flexibility by offering equipment that seamlessly integrates into their lab space without imposing additional spatial constraints. Through ongoing collaboration with experts and design engineers, MEMS has developed compact, skilled, and precise designs. This adaptability ensures that MEMS systems can fit even in the smallest spaces, providing researchers with a reliable and accurate hollow fiber manufacturing machine. Equipped with various sizes of spinnerets, gear pumps, inverter control, and other precision control systems, MEMS empowers researchers with precise control throughout the entire process, from spinning to winding.

Hollow Fiber Membrane Manufacturing Process

Dope formulation ⇒ Hollow fiber membrane spinning ⇒ Rinsing & drying ⇒ Module potting ⇒ Module cutting ⇒ QC/Performance evaluation

Spinning Systems

Item	System	Specification
HSL	Lab HFM Spinning System	Dope tank(1L) and supply by gear pump Non-temperature control system, Customer can connect water bath for the temperature control Free roll-guide, Winding speed is 5-30 m/min 900L x 500W x 1300H
HSR	Lab HFM Spinning System - Regular	Dope tank(1L) and supply by gear pump Temperature control available for storage tanks and coagulation bath (with circulation pump) Dope gear and winding speed control Touch scree control and data logging (7") 900L x 700W x 1,800H
HSH	High Functional HFM Spinning System for single layer membrane	Dope and inner coagulant tank; 2L Dope temperature control: RT ~ 70±5°C Motor driven roll-guide Xyz adjust of nozzle Temperature control for coagulation bath (RT~70°C) Detachable wheel, Winding speed is max. 30 m/min 2 Membrane wheel flushing bath for solvent removal 1800L x 800W x 1,800H
HSD	HFM Spinning System for Double-layer Membrane	Double-layered membrane spinning Dope and inner coagulant tank; 2L Dope temperature control: RT ~ 70±5°C Motor driven roll-guide Xyz adjust of nozzle Temperature control for coagulation bath (RT~70°C) Detachable wheel, Winding speed is max. 30 m/min 2 Membrane wheel flushing bath for solvent removal 1800L x 800W x 1,800H
HSH-P	HFM Pilot Spinning System for single-layer Membrane	2 Hole Pilot Scale Spinning System for Single layer membrane All the systems are temperature controlled Gear pumps are used for dope and inner coagulant supply Godet roll Traverse guide for winding system
HSD-P	HFM Pilot Spinning System for Double-layer Membrane	2 Hole Pilot Scale Spinning System for Double layer membrane All the systems are temperature controlled Gear pumps are used for dope and inner coagulant supply Godet roll Traverse guide for winding system



Potting Systems

Manufactured hollow fiber membrane is inserted into the module housing and then is put into the centrifugal potting system, after the placement of the housing modules inside the system an adhesive glue is then injected into the module housing and is allowed to rotate. An additional glue diffuser is hence strongly recommended as it helps precise mixing of PU or Epoxy adhesive whilst removing air bubbles from it, and injecting the adhesive into the module housing at precise temperatures.

Item	System	Specification
MPL	Lab Module Potting System	1~3inch x 300mmL, 600L x 600W x 1,000Hmm Speed control 0~350 rpm Hot air circulation, RT~ 50°C
MPP (700)	Pilot Module Potting System-700	2~4inch x 700mmL, 1,050L x 1,050W x 1,200Hmm Speed control 0~350 rpm Hot air circulation, RT~ 50°C
MPP (1000)	Pilot Module Potting System-1000	2~6inch x 1,000mmL, 1,500L x 1,500W x 1,200Hmm Speed control 0~350 rpm Hot air circulation, RT~ 50°C
MPC	Commercial Module Potting System	6~10inch x 2,000mmL, 3,000L x 3,200W x 3,200H Speed control 0~300 rpm Hot air circulation, RT~ 50°C
MPW	Water Purifier Module Potting System	Order-made system, 32mmD x 100mmL 24~48 eapotting/cycle 1,200L x 1,200W x 1,400H Hot air circulation, RT~ 50°C



Cutting Systems

The cutting system is essential for membrane development as it is the final and most important step of the process. Glued modules are cut at both ends and the final product is ready.

Item	System	Specification
MCL	Lab Module Cutting System	Max. 2 inch D x Max.20inch L 500L x 250W x 400H Guillotine, manual cutting
MCP	Pilot Module Cutting System	Max4 inch D x Max.40inch L 1,500L x 800W x 1800H Guillotine, automatic cutting PLC control
MCC	Commercial Module Cutting System	6~10inch D x Max.80inch L 2,500L x 1,000W x 2,300H Guillotine, hydraulic power moving AC Servo system, LM guide
MCW	Water purifier Module Cutting System	2~3inch x 160mmL, 1,000L x 1,000W x 2,000H Automatic cutting



Coating Systems

Coating systems for Gas, RO, FO, PRO and other composite membranes

Item	System	Specification
HCS	Hollow fiber membrane solution coating system	Winding & unwinding and tension control Dip coating and drying system 1~10 m/min by inverter control and traverse winding Temperature control RT ~ 120°Cby air blower 1,800L x 1,000W x 2,000H
HCP	Hollow fiber membrane TFC coating system by polymerization	Three Chemical treatment process (Amine-Acyl Chloride-post chemical treat) 0.4~2 m/min by inverter control and traverse winding Godet roll, insulating, N2 gas purge, Temp. control : 10,500L x 4,000W x 2,000H
HCM	Hollow fiber membrane coating system as a module	Two chemical treatment of membrane module as it is. Max. 10L/min flow of chemicals Modules are set in the oven, temperature controlled : 1,800 L x 840W x 1,720H

