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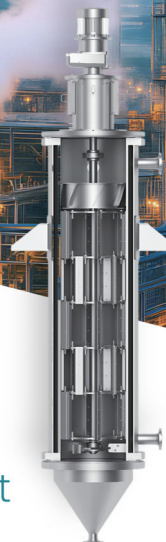
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薄膜蒸发装置 Thin Film Evaporation Unit

石油化工 | 精细化工 | 电子化学品 | 医药日化

Petrochemicals | Fine Chemicals | Electronic Chemicals | Pharmaceuticals & Daily Chemicals



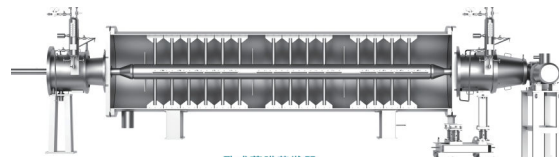
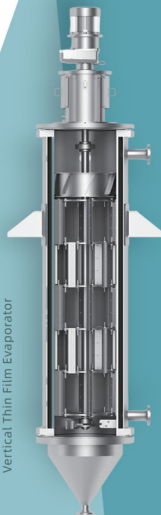
上海森永工程设备股份有限公司
SHANGHAI NAGAMORI MACHINERY CO.,LTD.

薄膜蒸发器

Thin Film Evaporator

薄膜蒸发器是一种通过设备上的电机，驱动筒体内各种机械刮壁装置，使原料连续均匀地以薄膜形式分布在加热壁面，在真空或微正压条件下蒸发的新型高效蒸发器。它传热系数大、蒸发强度高、停留时间短，尤其适宜热敏物料、高粘度物料及含颗粒物料的蒸发浓缩、脱气脱溶、蒸馏提纯。

Thin film evaporator is a high-efficiency device that utilizes a motor to drive mechanical scraping assemblies within the cylinder, continuously and uniformly distributing raw materials as a thin film across the heated wall for falling-film evaporation under vacuum conditions. Featuring a high heat transfer coefficient, high evaporation intensity, and short residence time, it is particularly suitable for the evaporation, concentration, degassing, solvent recovery, distillation, and purification of heat-sensitive, high-viscosity, and solid-containing materials.

立式薄膜蒸发器
Vertical Thin Film Evaporator卧式薄膜蒸发器
Horizontal Thin Film Evaporator

产品优势 Product Advantages

- 压力损失小；
- 蒸发温度低，受热时间短；
- 总传热系数大，蒸发效率高；
- 对产品浓度的调节范围大；
- 适用于苛刻流体（高粘流体、含固物料、易结垢物料、热敏物料）。
- Low pressure loss
- Low evaporation temperature and short heat exposure time
- High overall heat transfer coefficient and evaporation efficiency
- Wide adjustment range for product concentration
- Suitable for demanding fluids (high-viscosity fluids, solid-containing materials, fouling-prone materials, and heat-sensitive materials).

薄膜蒸发器组装试运转
Assembly and Trial Operation
of Thin Film Evaporators

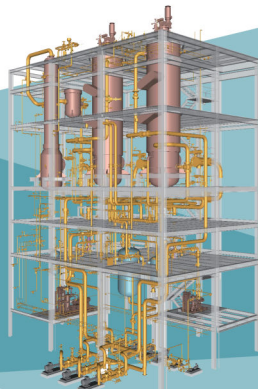
短程蒸发器

高真空 · 高精度 · 高效率
High Vacuum · High Precision · High Efficiency

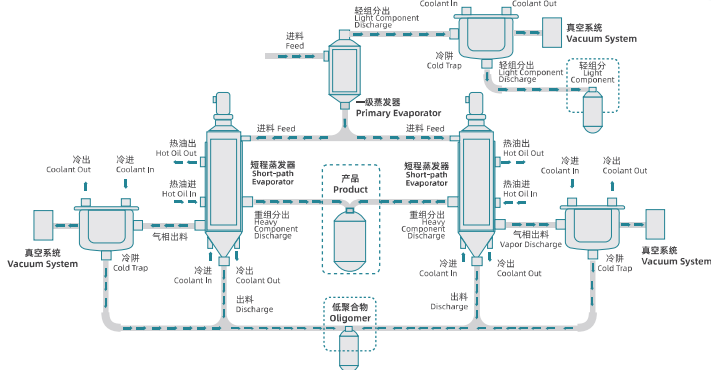
Short-path Evaporator

国产首套PTMEG分子量窄单元短程蒸发系统，全球为数不多能实现系统设计和短程制造的厂家。

Successfully delivered China's first short-path evaporation system for the PTMEG molecular weight narrowing unit, positioning the company as one of the few global manufacturers capable of integrating both system design and short-path equipment fabrication.



■ 短程蒸发流程 Short-path Evaporation Process



■ 真空实验及安装调试 Vacuum Testing, Installation, and Commissioning



■ 产品优势 Product Advantages

- 采用一段式筒体结构，减少密封面，降低泄漏风险；
- 可进行操作压力下的真空复检，确保极低泄漏量；
- 配备激光跟踪仪检测筒体转子的圆度 / 直线度，满足高精度制造要求；
- 具备ASPEN 模拟能力，涵盖短程、真空系统、公用工程系统一体化设计与交付。
- Adopt a single-piece shell structure to reduce sealing surfaces and lower leakage risks.
- Conduct vacuum helium leak testing under operating pressure to ensure ultra-low leakage rates.
- Equipped with laser trackers to inspect the roundness/straightness of the shell and rotor to meet high-precision manufacturing requirements.
- Possess ASPEN simulation capabilities, covering integrated design & delivery for short-path, vacuum, and utility systems.

■ 薄膜及短程蒸发器的刮板类型 Scraper Types for Thin Film and Short-path Evaporators



薄膜蒸发器

THIN FILM EVAPORATOR

薄膜蒸发器使用于热敏及高沸点产品的分离。

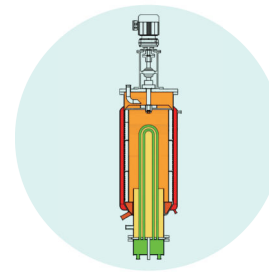
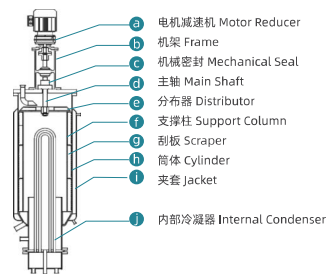
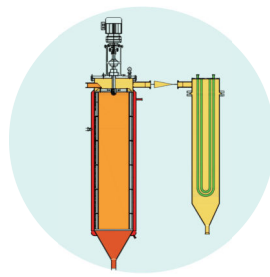
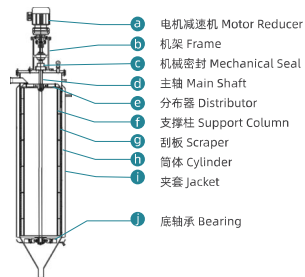
Thin film evaporators are used for the separation of heat-sensitive and high-boiling-point products.

短程蒸发器

SHORT-PATH EVAPORATOR

短程蒸发器操作压力低至0.001mbar (A)。

Short-path evaporators operate at pressures as low as 0.001 mbar(A).



■ 薄膜蒸发器结构及型号 Structure & Model of Thin-film Evaporator

型号 Model	传热面积(m²) Heat Transfer Area	筒体内径(mm) DN Inner Diameter of The Cylinder	夹套内径(mm) D Jacket Inner Diameter	设备总高(mm) H Total Equipment Height	电机功率(KW) Motor Power	重量(KG) Weight
TFE-002	0.25	Φ200	Φ250	1960	0.55	195
TFE-010	1	Φ400	Φ500	2630	1.1	800
TFE-035	3.5	Φ500	Φ600	4700	5.5	1500
TFE-050	5	Φ700	Φ800	5890	7.5	2500
TFE-080	8	Φ900	Φ900	6000	7.5	3800
TFE-100	10	Φ900	Φ1000	7790	7.5	5200
TFE-150	15	Φ1400	Φ1500	11500	11	8500
TFE-200	20	Φ1400	Φ1500	11500	15	15000
TFE-250	25	Φ1400	Φ1500	12210	18.5	16500
TFE-300	30	Φ1600	Φ1700	13530	22	17300
TFE-350	35	Φ1600	Φ1700	14750	37	20000
TFE-400	40	Φ1600	Φ1700	16080	37	22000

■ 短程蒸发器结构及型号 Structure & Model of Short-path Evaporator

型号 Model	传热面积(m²) Heat Transfer Area	筒体内径(mm) DN Inner Diameter of The Cylinder	夹套内径(mm) D Jacket Inner Diameter	设备总高(mm) H Total Equipment Height	电机功率(KW) Motor Power	重量(KG) Weight
SPE-002	0.25	Φ200	Φ300	1600	0.55	400
SPE-010	1	Φ600	Φ600	2420	1.1	1100
SPE-035	3.5	Φ700	Φ900	4000	5.5	2000
SPE-050	5	Φ1000	Φ1200	5410	7.5	3700
SPE-080	8	Φ1100	Φ1300	5860	7.5	4600
SPE-100	10	Φ1200	Φ1400	7500	7.5	7500
SPE-150	15	Φ1600	Φ1700	11000	11	12000
SPE-200	20	Φ1600	Φ1700	11000	15	17300
SPE-250	25	Φ1600	Φ1700	12210	18.5	19200
SPE-300	30	Φ1700	Φ1800	13530	22	22600
SPE-350	35	Φ1700	Φ1800	14750	37	27000
SPE-400	40	Φ1700	Φ1800	16080	37	30000



Chemical & Petrochemical 化工 & 石油化工	物料 Materials	工艺 Process
	氯化石蜡油 Chlorinated paraffin grease	蒸馏 Distillation
	三氯化钛 Titanium trichloride	蒸馏 Distillation
	氧化锰 Manganese oxide	蒸馏 Distillation
	硅油 Silicone oil	蒸馏 Distillation
	蜡油 Wax Oil	浓缩 Concentration
	聚乙烯醇 Polyvinyl alcohol	浓缩 Concentration
	保险粉 Sodium powder	浓缩 Concentration
	甲苯二异氰酸 Toluene diacetyl cyanide	浓缩 Concentration
	琥珀酸 Succinic acid	浓缩 Concentration
Chemical 化工	碱碱废水 (氨碱) Caustic soda	回收精馏 Recovery and rectification
	高淳 Higher alcohol	回收精馏 Recovery and rectification
	苯乙烯单体 Styrene monomer	回收精馏 Recovery and rectification
	BDO	回收精馏 Recovery and rectification
	甲基丙烯酸酯 Methacrylate acid	精馏 Rectification
	丙烯酸 Acrylic acid	回收精馏 Recovery and rectification
	改性 MDI	埃碳胺类催化剂 Carbamates catalyst

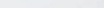
Thin film and short-path evaporation units are utilized in chemical, pharmaceutical, food, and petroleum industries for product evaporation, concentration, solvent removal, and drying.

Synthetic,
Rubber & Fiber

合成树脂、橡胶和纤维

物料 Materials	工艺 Process
环氧树脂 Epoxy resin	脱溶剂 Desolvent
EE橡胶 ED rubber	脱水 Dehydration
聚丙烯 Polypropylene	脱溶剂 Desolvent
聚二烯橡胶 Polydiene rubber	脱溶剂 Desolvent
尼龙六 Pa6	脱溶剂 Desolvent
尼龙六六 Pa66	脱溶剂 Desolvent
聚酯纤维素 Polyester cellulose	脱溶剂 Desolvent
对苯二甲酸盐 Terephthalate	浓缩 Concentration
聚碳酸树脂 PC	浓缩 Concentration
己内酰胺 Caprolactam	精馏 Rectification
聚丁烯 Polybutene	蒸馏 Distillation
聚丁二烯 Polybutadiene	浓缩 Concentration
聚乙烯 Polyethylene	浓缩 Concentration

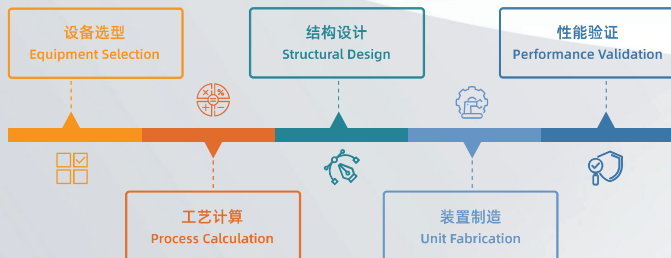
 Medicine 医药	抗菌素溶液 Antibiotic	浓度 Concentration
	高粘性物料 High viscosity material	浓度 Concentration
	热敏性物料 Heat sensitive material	浓度 Concentration
	维生素 Vitamin	浓度 Concentration

 Pesticide 农药	甲胺磷 Methamidophos	脱溶剂 Desolvent
	氟戊菊酯 Fenvalerate	脱溶剂 Desolvent

 Food 食品	饮料 Drink 凝胶体 Gel 氨基酸 Amino acid 蜂蜜 Honey 低聚 Oligosaccharide	浓缩 Concentration 浓缩 Concentration 脱水 Dehydration 浓缩 Concentration
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 Olefin 油脂	甘油 Glycerin	精溜 Rectification
	脂肪酸 Fatty acid	精溜 Rectification
	卵磷脂 Lecithin	脱水 Dehydration
	溶剂油 Solvent oil	脱水 Dehydration

全流程设计制造 Full-process Design & Manufacturing



实验系统小试 → 中试 → 设计放大

Laboratory and Pilot Scale Testing, and Design Scale-up



可视化原理探索 Visualization Principles



小试装置 Lab-scale Unit



中试装置 Pilot Plant Unit



工业化应用 Industrial Applications



PTMEG真空实验 PTMEG Vacuum Experiment

项目业绩 Project Performance



薄膜蒸发器
Thin Film Evaporator

尺寸/Size: $\Phi 1,800 \times 13,000$
 重量/Weight: 48T
 功率/Power: 1,950kW
 传热面积: 52m²

莱赛尔纤维
Lyocell Fiber



薄膜蒸发器
Thin film evaporator

尺寸/Size: $\Phi 2,000 \times 16,300$
 重量/Weight: 27T
 材料/Material: 316L

MMA



薄膜蒸发器
Thin Film Evaporator

尺寸/Size: $\Phi 1,400 \times 9,000$
 重量/Weight: 22T
 材料/Material: 316L

锂电池
Lithium Battery



薄膜蒸发器
Thin Film Evaporator

尺寸/Size: $\Phi 1,200 \times 10,100$
 重量/Weight: 22T
 设计压力: 11.5MPa
 设计温度: 340°C

PTA



短程蒸发器
Short-path Evaporator

尺寸/Size: $\Phi 2,250 \times 14,500$
 重量/Weight: 59T
 材料/Material: SA516.70+304L
 工作压力: $\leq 10\text{Pa(A)}$

r-PET



短程蒸发器
Short-path Evaporator

尺寸/Size: $\Phi 2,000 \times 14,000$
 重量/Weight: 47T
 材料/Material: 304
 工作压力: $\leq 3\text{Pa(A)}$

PTMEG