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Lehui Beer Membrane Filtration System



2023

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01

PART 01

Why BMF ?

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Why BMF ?

◆ Membrane filtration is the latest in beer filtration



DE filtration

- 1、 DE as resources is becoming scarce.
- 2、 **Environmental requirements are increasing and waste DE disposal is becoming more difficult**
- 3、 Health effects of dust from DE preparation
- 4、 **Difficulty in controlling O2 pick up**, which affects beer taste.
- 5、 DE iron ions affect beer specification
- 6、 DE preparation process cannot be operated fully automatically

Membrane filtration

- 1、 Use membrane filtration to protect environment.
- 2、 Membrane can be reused, **repeatedly regenerated, long life**
- 3、 Completely automatic control, no human intervention.
- 4、 Beer **quality is more stable**, no increase in iron ions .
- 5、 Long continuous filtration time, **high efficiency**
- 6、 Filtration is not affected by power failures, pressure fluctuations, etc.,



Why BMF ?

DE filtration vs BMF

	DE Filtration	BMF	Comments
Filtration turbidity	< 0.5 EBC	< 0.5 EBC	
Microbial impact	High	Low	DE systems can have more microbial impact
DE dosing	Yes	No	
Pressure fluctuations	Yes	No	
Oxygen pick up	Medium	Low	DE filtration brings in oxygen when adding DE
Beer flavours	Normal	Good	The membrane can maintain the original flavour
Iron and manganese ions	Bring in from DE	Decreased	Membrane filtration will also filter out some iron ions and NA+ sodium ions
No.yeast after filtration	Small amount	Close to none	
Labour intensity	High	Low	Manual delivery of DE is required, as well as manual burial of waste DE and frequent manual cleaning of the outdoor discharge area.
Continuous operation	No	Yes	BMF need short SBF in production between, major CIP only in 3-7 days
Filtration efficiency within 72 hours	75%	85%	May fluctuate depending on beer type
CIP frequency	High, CIP everyday	Low	Short cleaning in between production, major cleaning only in 3-7 days
ESH impact	Yes	No	DE is added with dust and the discharge of waste DE requires special treatment

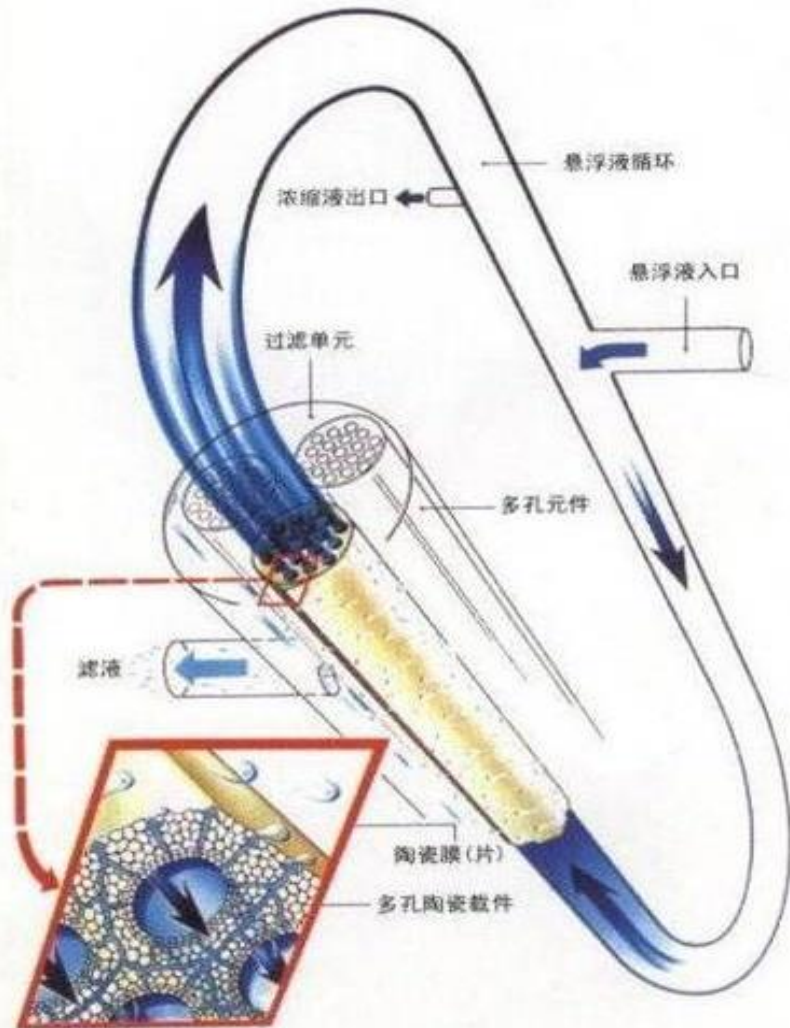


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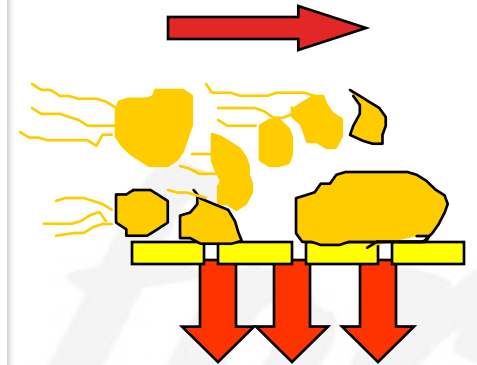
PART 02

Filtration principle

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- ◆ The flowing direction between concentrate with filtered beer is staggered vertically
- ◆ The unfiltered beer flows rapidly in the **internal pressure membrane** pore, **continuously scouring the inner surface of the film and taking away the sediment**, thus preventing the blockage of the filter hole, maintaining the steady outflow of bright beer and extending the filtration time



◆ End condition of DE filtration :

- 1、 The candle reaches its maximum DE loading
- 2、 The pressure difference reaches a certain value

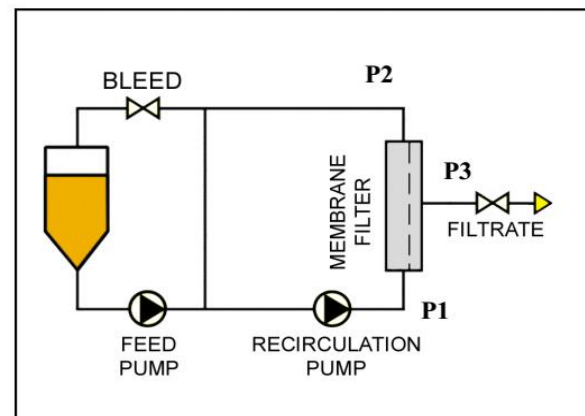
◆ End condition of BMF :

TMP (Trans Membrane Pressure) reach the setpoint

◆ Difference:

BMF will adapt itself to the different beer brand. The TMP with good filtrability rises slowly and the filtration time is long. But the dosing of DE is a pre-set value by recipe. Under the condition of a certain maximum DE loading ,the filtration time is fixed, so the maximum filtration capacity cannot be brought into play.

End condition of filtration



$$TMP = \frac{P1 + P2}{2} - P3$$

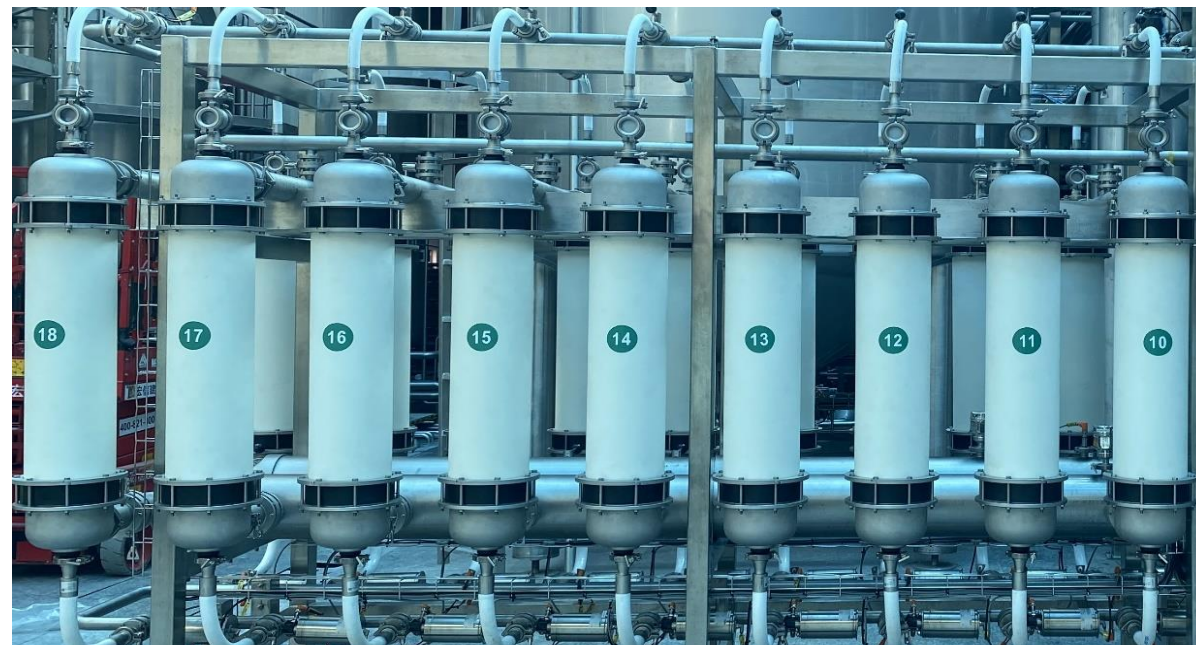
◆ **Module Origin:** Europe

◆ **End cap:** SS316L

◆ **Housing material:** Noryl

◆ **Membrane material:** PES/ PVP

◆ **Potting material:** Epoxy resin





03

PART 03

Equipment composition

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Design capacity: 500 hl/h

- 1、 Filter main module**
- 2、 Distribution Matrix**
- 3、 Unfiltered buffer tank**
- 4、 Filtered buffer tank**
- 5、 CIP station**





Equipment composition

Filter main module

Parameters for each module:

◆ **Filtration capacity:** 100-150 hl/h

◆ **Number of membrane module:**

18 pcs

◆ **Main circulation pump:**

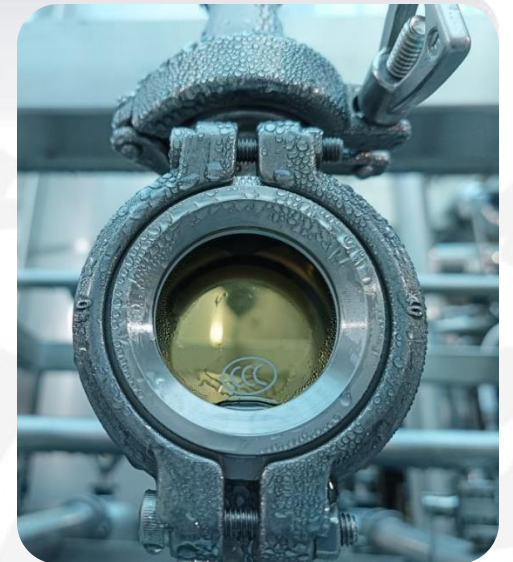
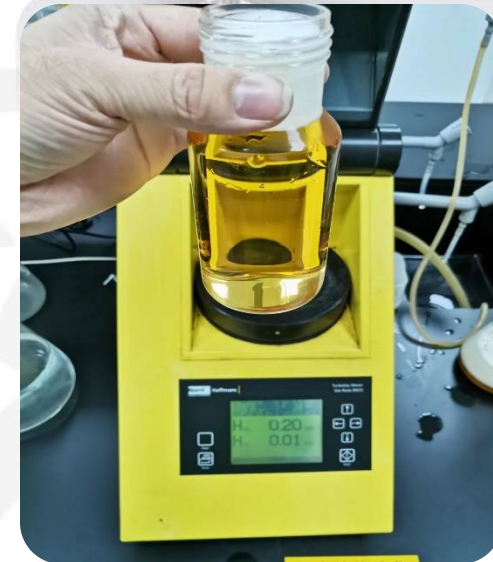
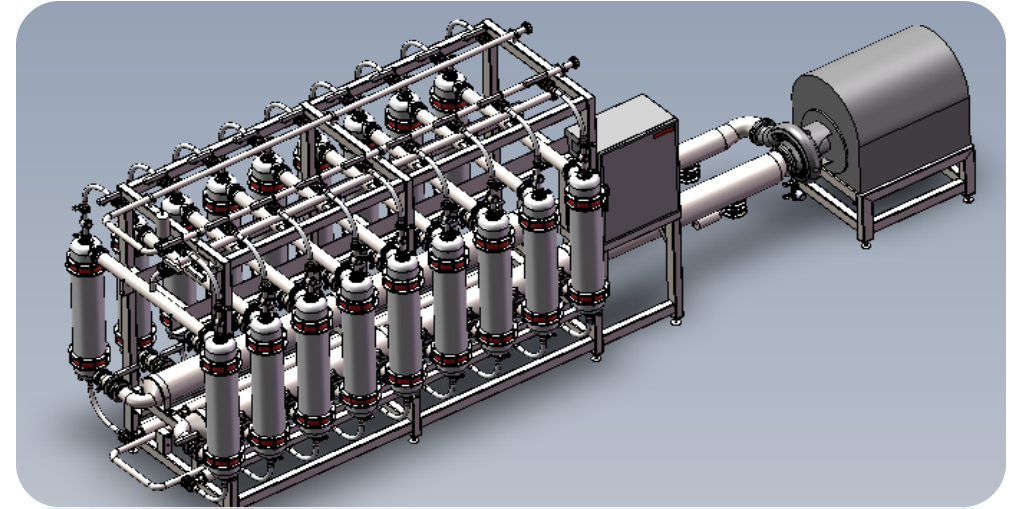
◆ **Filtration speed:** 1.5 m/s

◆ **Electrical cabinet:** 1 pcs



1. **Unaffected by sudden pressure changes**, no need to hold pressure to prevent soil loss
2. Independent of power outages, filtering can be started and paused at any time
3. No need for precoating, **"0" head beer**
4. **No DE dosing, no risk of oxygen pick up**, no change to the original flavour
5. **Short preparation time, high efficiency**

Preparation time: DE 120min, BMF 20min



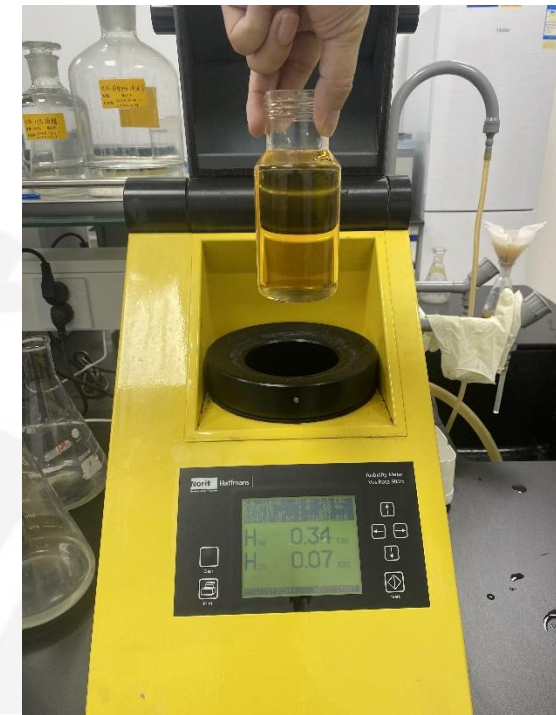


PART 04

Performance

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- Filtration capacity : 50-800 hl/h
- Turbidity after filtration : <0.5 EBC (90 degree)
- Oxygen pick up : <10 ppb
- Loss of O.G. : < 0.1° P
- Loss of beer : <0.3%





PART 05

Site photo

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Site photo

Front overall view





Site photo

Side overall view





THANKS
FOR WATCHING

NINGBO LEHUI INTERNATIONAL ENGINEERING EQUIPMENT CO.,LTD.

宁波乐惠国际工程装备股份有限公司

No.1 Chaohui Road, Xiangxi Industrial Zone, Xiangshan County, Ningbo City, Zhejiang 315722 P.R.China

浙江省宁波市象山县西周镇象西机电园区朝晖路1号

Email: sales@lehui.com www.lehui.com