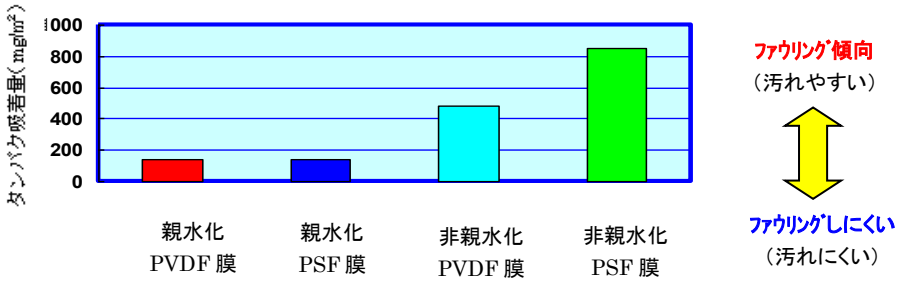
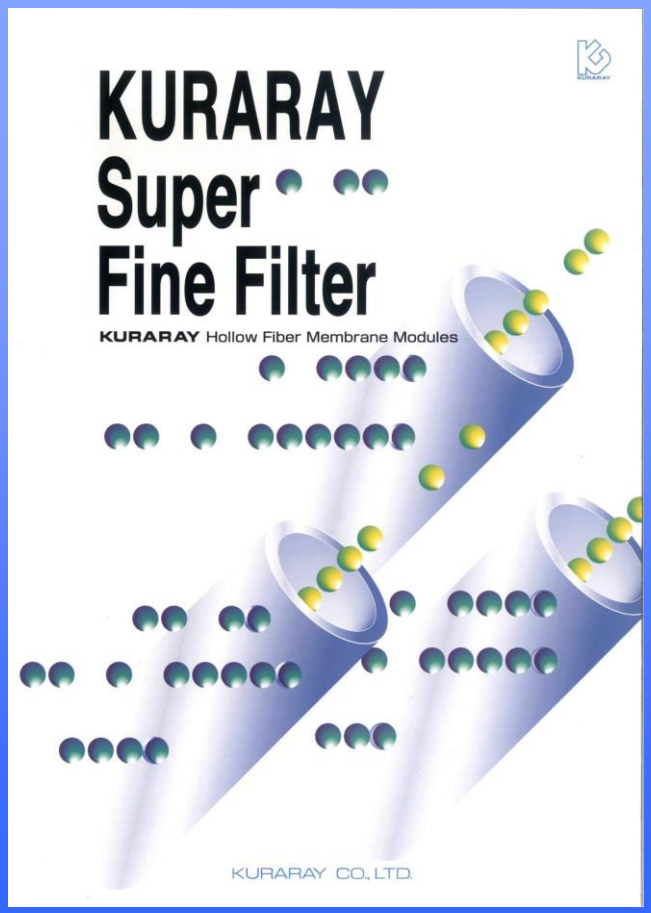
記入日　2020 年 8 月 5 日

会社・団体名	株式会社クラレ 英文名：KURARAY CO., LTD.			
技術・設備名	水処理用ろ過膜			
分類		（1）省エネルギー	○	（5）水処理
		（2）新エネルギー		（6）土壌汚染防止・土壌改良
		（3）大気汚染対策		（7）スマートシティ
		（4）循環経済		（8）その他
特徴（PRポイント）	限外ろ過および精密ろ過用の中空糸膜モジュールは、差別化された豊富な製品を有しており、工程水の高度処理、排水・排液の処理および回収、医療・食品関連分野での除菌・除濁などに幅広く対応しています。			
具体的な省エネ・環境効果、経済性	◆外圧全量ろ過方式のモジュールは、独自のエレメント構造と洗浄方式（エアバックウォッシュ法）によって高いろ過性能を発揮します。  ◆ポリスルホン（PSF）製またはPVDF製の中空糸膜を独自の親水性樹脂でコーティングすることにより、ファウリング（膜の目詰まり）を抑制します。  ◆GL モジュールは孔径 0.02μm で当社従来比 3 倍の透水性能を実現し、清澄な水では最大 13m3/hr（8m3/m2/日）のろ過運転が可能です。また、濁質排出性にも優れ、高濁度の原水にも対応可能です。  			

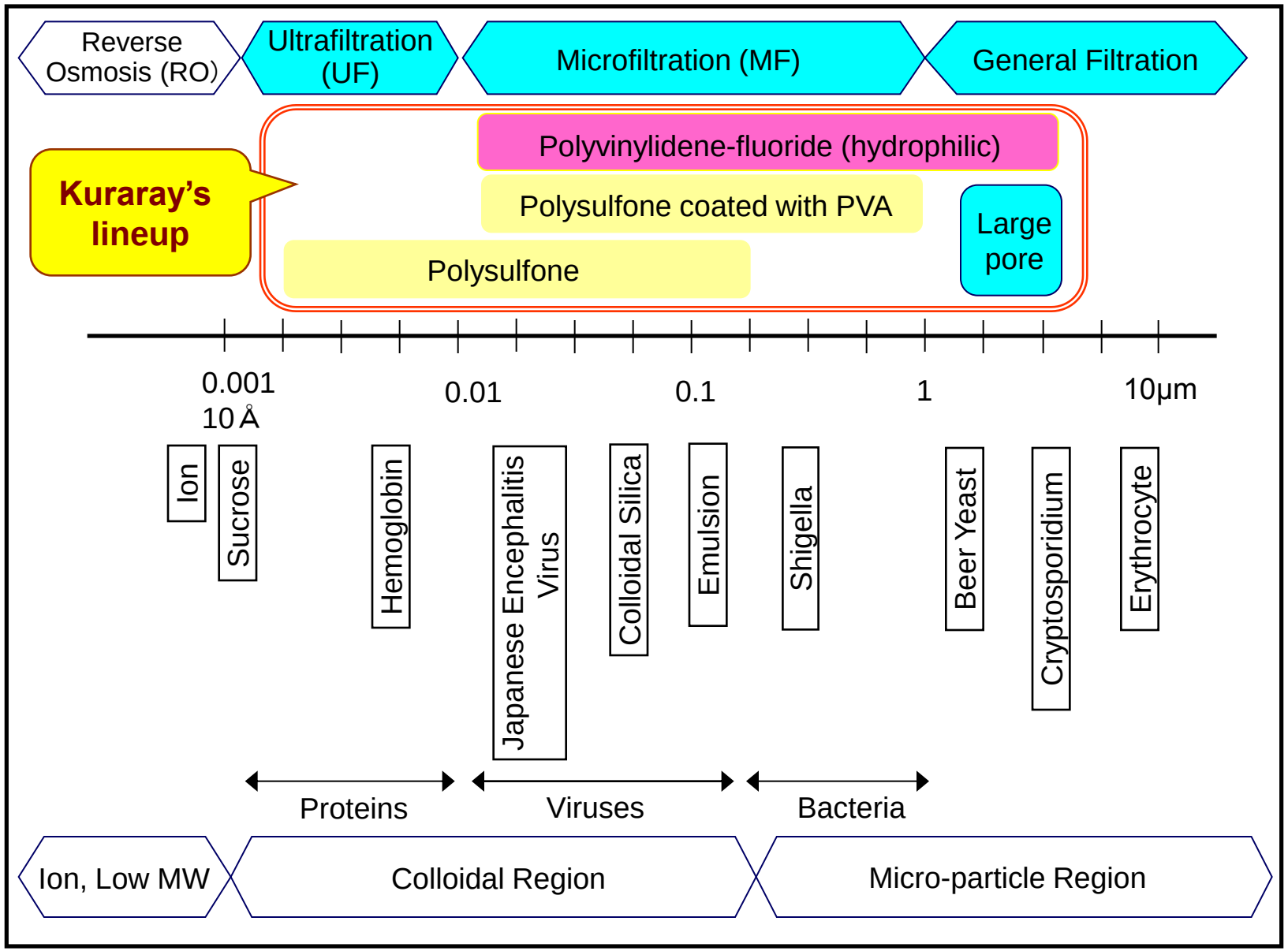
概要・原理	
実績	日本国内を中心に、電子・半導体産業、自動車・機械産業、化学・医薬産業、食品・醸造産業などで多数の納入実績があります。

中国での連絡先	担当者名：石原　裕久（可楽麗国際貿易（上海）有限公司） TEL：+86-21-6119-8111 E-mail：Hirohisa.Ishihara@kuraray.com 〒200030 上海市徐匯区虹橋路 3 号　港匯中心二座　2207 単元
日本での連絡先	担当者名：白木　国広（アクア販売部） TEL：03-6701-1663 E-mail：Kunihiro.Siraki@kuraray.com 〒100-8115 東京都千代田区大手町 1-1-3　大手センタービル
Web　URL	https://www.kuraray.co.jp

Hollow Fiber Membrane products



Particle Size and Membrane Technology

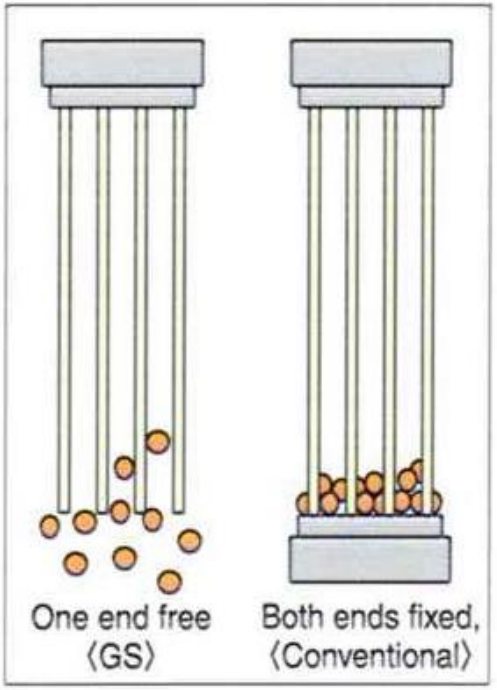


Feature of Kraray Hollow Fiber Membranes

1. Membrane surface is hydrophilic despite base polymers (Polysulfone and polyvinylidene fluoride) are hydrophobic so that less fouling occurs.

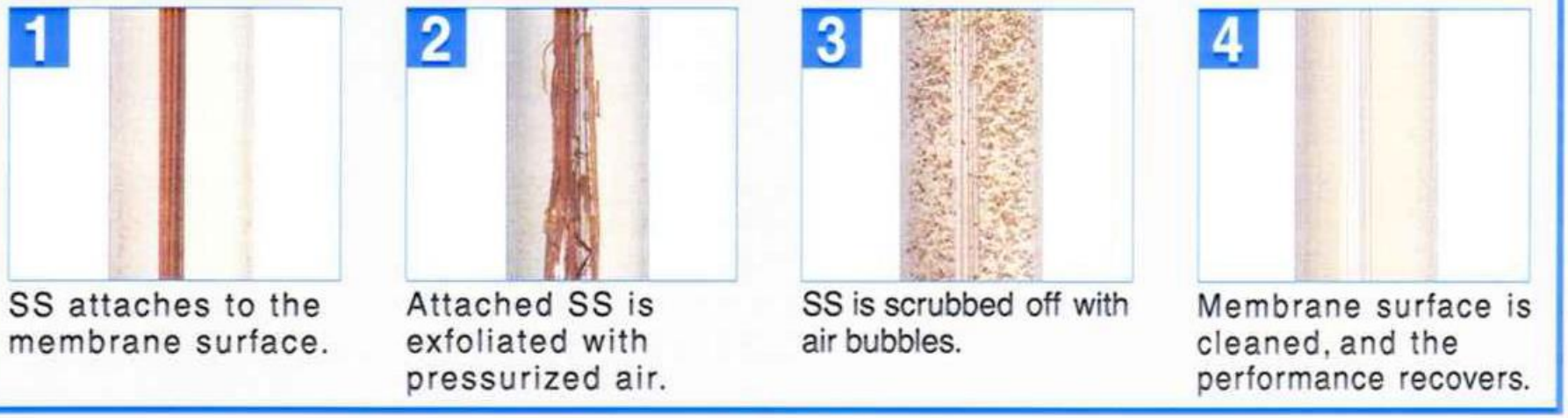
2. One end free structure make the removal of the suspended solid easy.

3. Unique physical cleaning technology



Physical cleaning procedure

Photos of PSF hollow fibers



Applications of Kuraray's HFM Products

	Corresponding products
1. Purification of beverages and chemicals:	SF
2. Ultra pure water treatment:	
- RO pretreatment	GS
- Final filter for ultra pure water production process	Type-C, S
- Point of use	Type-C, S
- Recycle	SF
3. Potable water treatment:	GS, LPM
4. Recycle:	SF
- Hot water	
- Absorbent for absorption refrigerator (LiBr solution)	



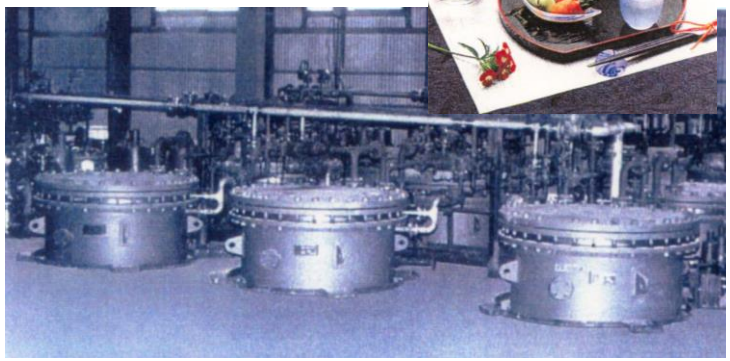
The detail of each application is shown in the following slides.

1. Purification of beverages and chemicals

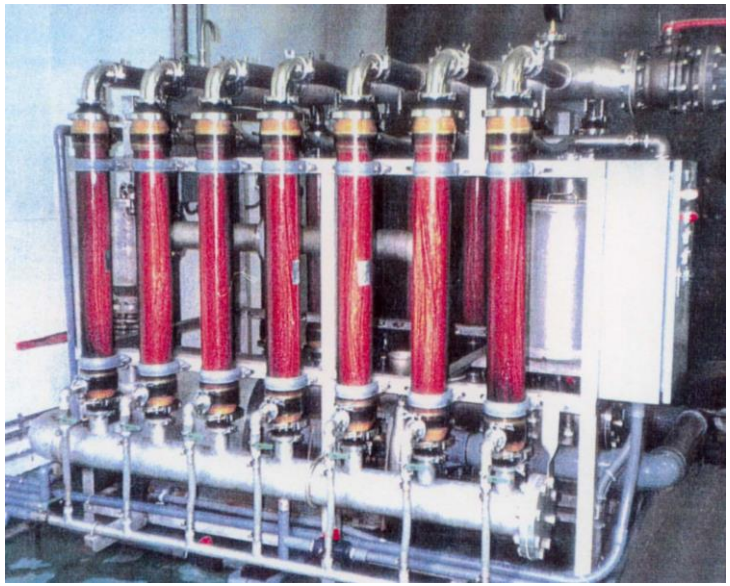
◆Applications to food industries

Removal of bacteria, enzyme and suspended solid





1. **Sake…Over 400 plants (40%)**
   The largest market share in Japan.
2. **Soy source…about 40 plants**
3. **Vinegar…10 plants**
4. **Others…Soft drinks, beer, etc.**

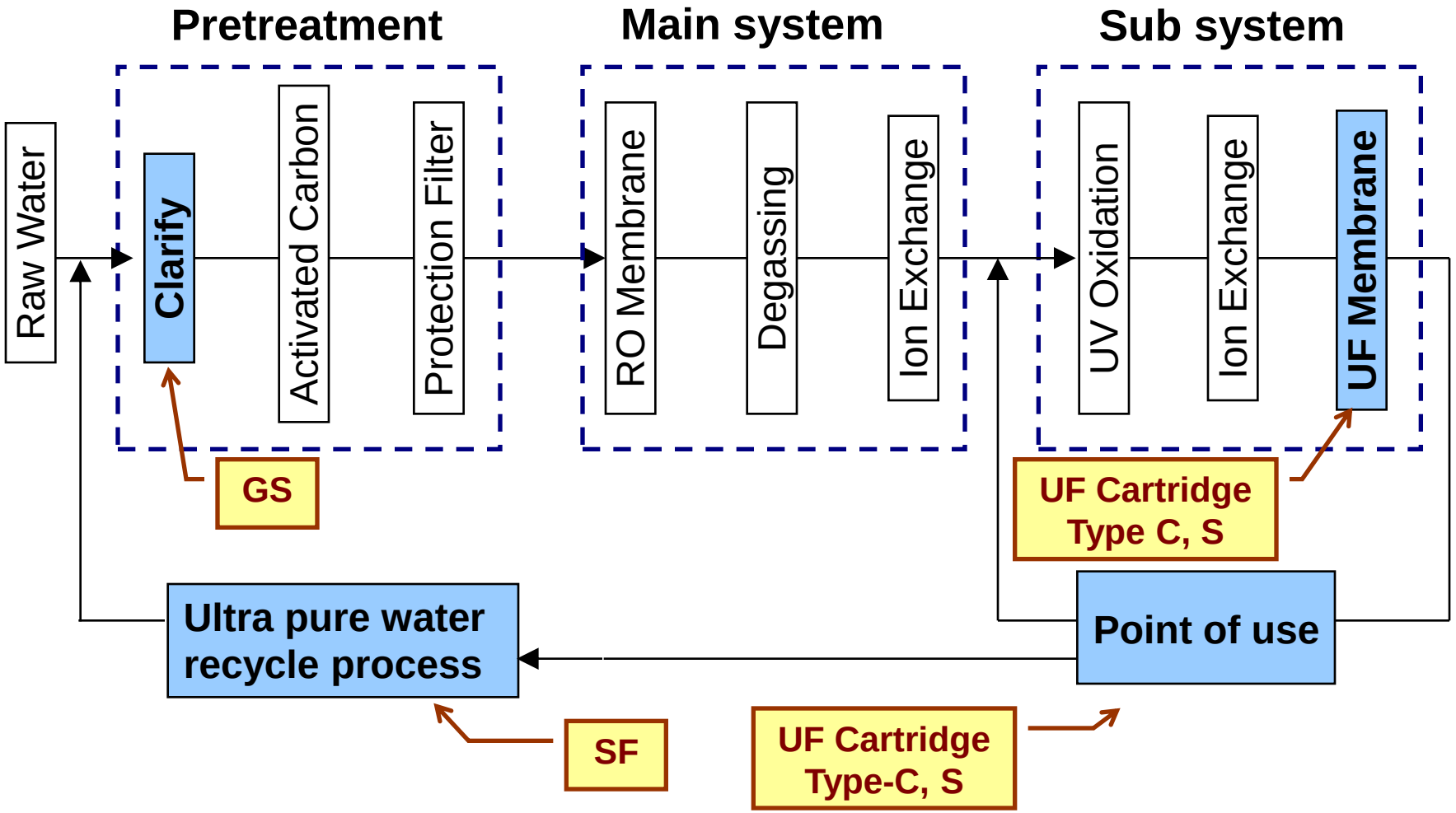






2. Ultra pure water treatment

◆Ultra pure water production flow



◆RO (reverse osmosis) pretreatment

GS module

Pore size: 0.02 μm

Membrane surface area: 42 m^2

Filtration: Outside-in, dead-end



GS module wins the largest market share in the RO pretreatment market in Japan, with being standardized by many major engineering companies like Kurita, Nomura, Hitachi Plant, etc.



Catalog No. 2003

KURITA

膜式前処理装置 ＰＦ－Ｇ型

Membrane filter PF －G series

中空糸膜を用いて安定した水質の処理水を供給

Stable high quality water is made with hollow fiber configuration membrane.

ろ過方式による除去物質サイズ

Size of the removal material depends on the filtrate method

一般ろ過 Medium filtration

精密ろ過 Micro filtration

限外ろ過 Ultra filtration

逆浸透 (RO)

膜ろ過装置PF-G型 Membrane filter PF－G series

μm

0.0001 0.001 0.01 0.05 0.1 0.5 1 5 10

イオン・低分子領域 Ion /Micro molecular

コロイド領域 Colloid

懸濁質領域 Suspended solid

クリプトスポリジウム Cryptosporidium

● 特　長

・高度な処理水
細かい懸濁物質を除去できる膜処理のため、逆浸透膜の前処理に最適です。

・安定した処理水
精密な穴径を持った膜ろ過ですので、原水水質が変動しても安定した水質が保てます。

・ろ過装置に比べ省スペースで逆洗排水量も少ない。

● Characteristics

・High quality permeate water
It is suitable for pretreatment of Reverse Osmosis supply water, because small suspended materials can be removed with membrane.

・Stable permeate water quality
Membrane have a precise pore size,so,stable quality permeate water can be produced without affection of feed water quality fluctuation.

・Compared with the medium filter, it is very compact. Further, it needs much less amount of backwash water than medium filter.

● 用　途

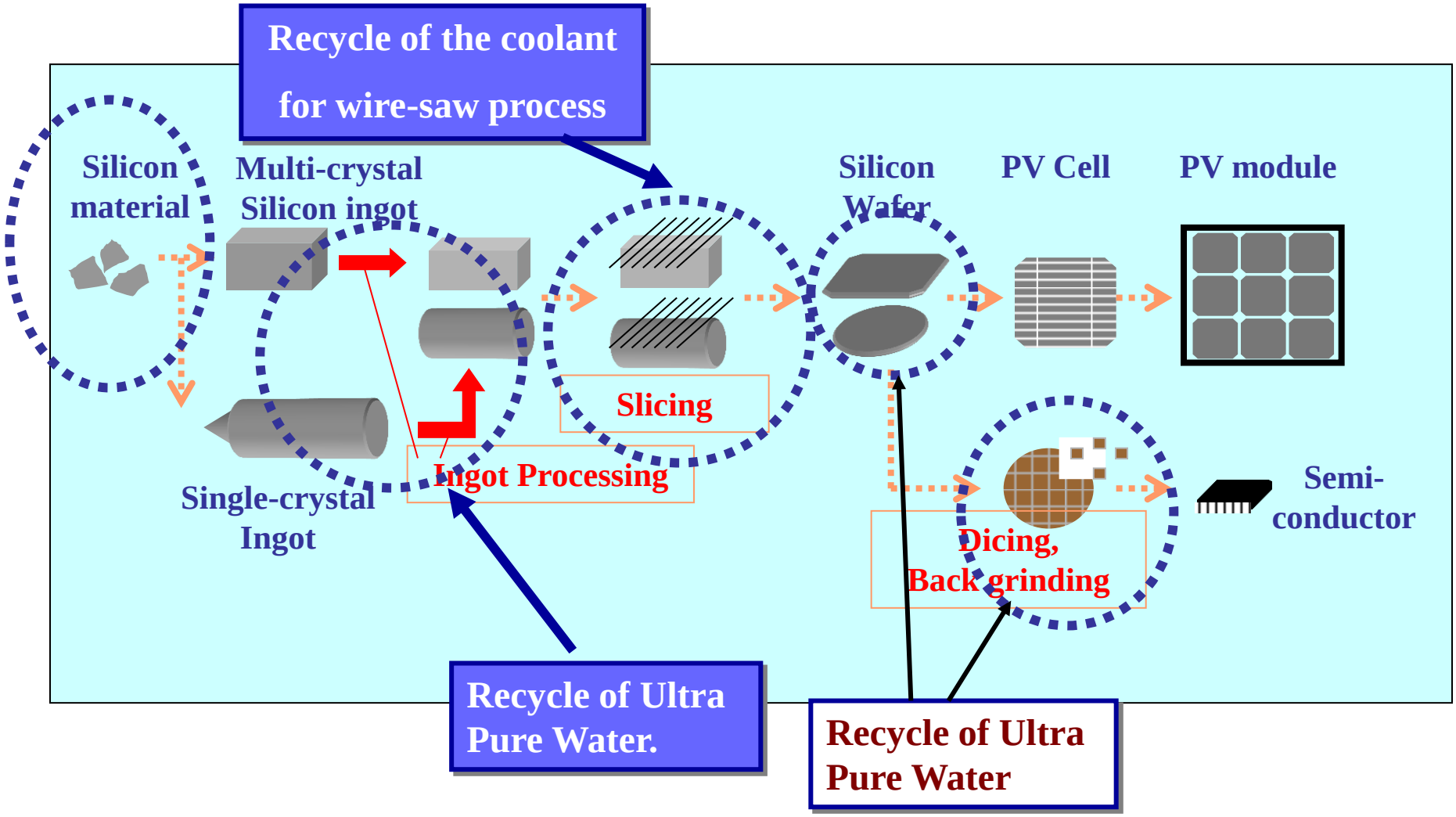
・逆浸透膜の前処理
・食品製造用水
・洗浄用水
・プロセス水の高度処理
・一般急速ろ過器の代替え

● Applications

・Pretreatment of reverse osmosis supply water
・Food industry process water
・Rinsing water
・High grade treatment of process water
・Substitutes for the medium filter

Kurita Water Industries Ltd.

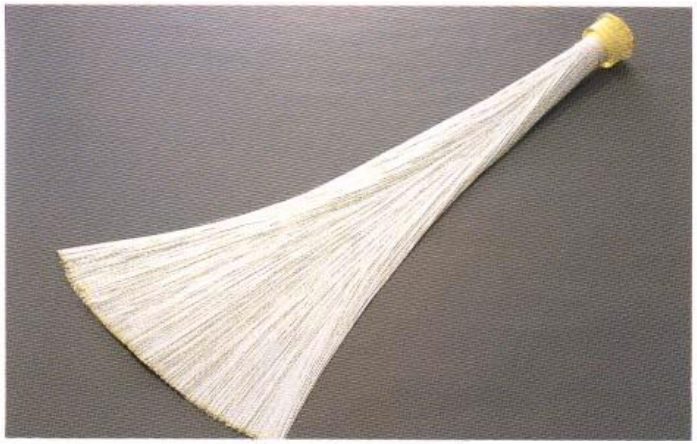
◆ Recycle of Ultra Pure Water in Semi-conductor and Photovoltaic Industry



◆Wastewater Treatment and Recycle

SF element
Pore size: 0.02 μm
Membrane surface area: 7 m^2

T7 tank module
7 elements can be installed.
Membrane surface area: 49 m^2
Filtration: Outside-in, dead-end



▲ HF Element



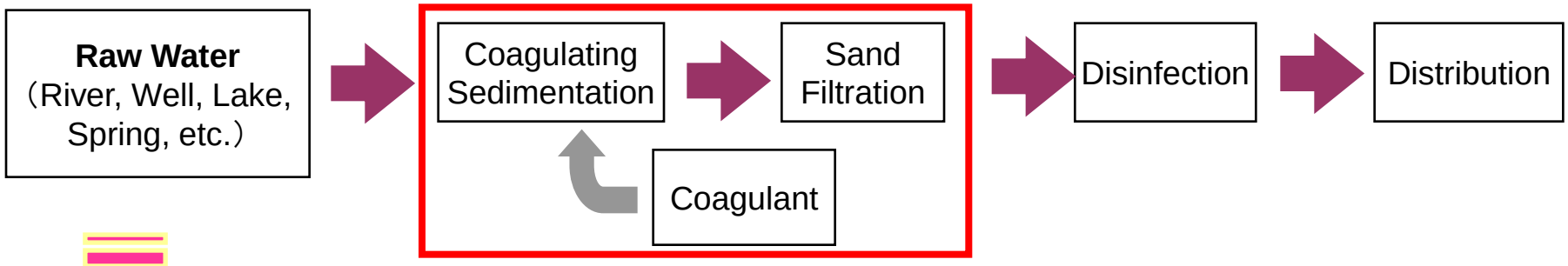
Over 200 applications…..

Inorganic wastewater treatment
- Semiconductor industry
  Dicing, back-grind and beveling processes
- FPD industry
  Grinding and rinsing processes for glasses for LCD and PDP

Recycle
- Ultra pure water

3. Potable water treatment

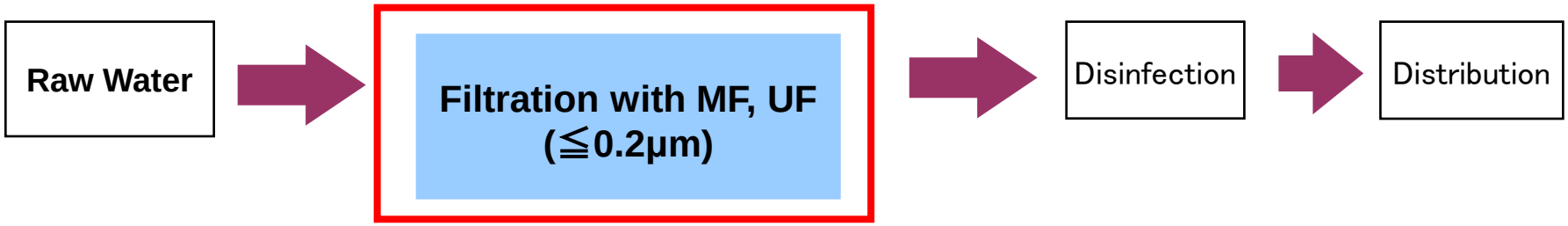
◆Sand filtration (conventional)



●Advantage
- Most common
- Cost effective

● Disadvantage
- O & M is complicated.
- Unable to remove pathogenic protozoa called Cryptosporidium.

◆Membrane filtration (MF/ UF)

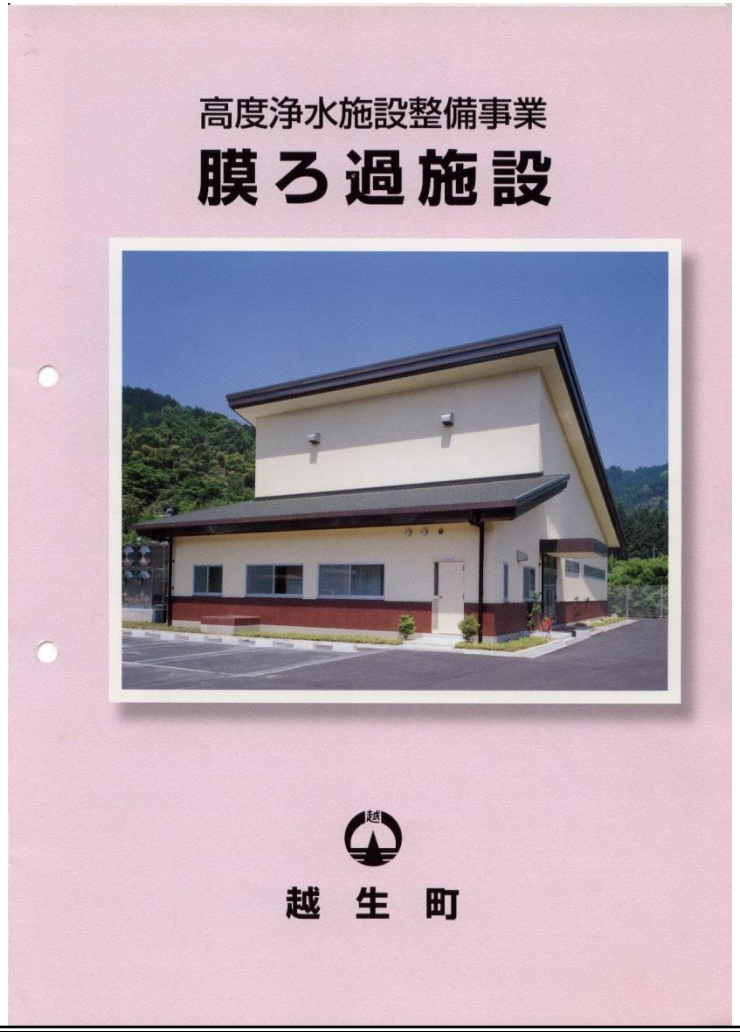


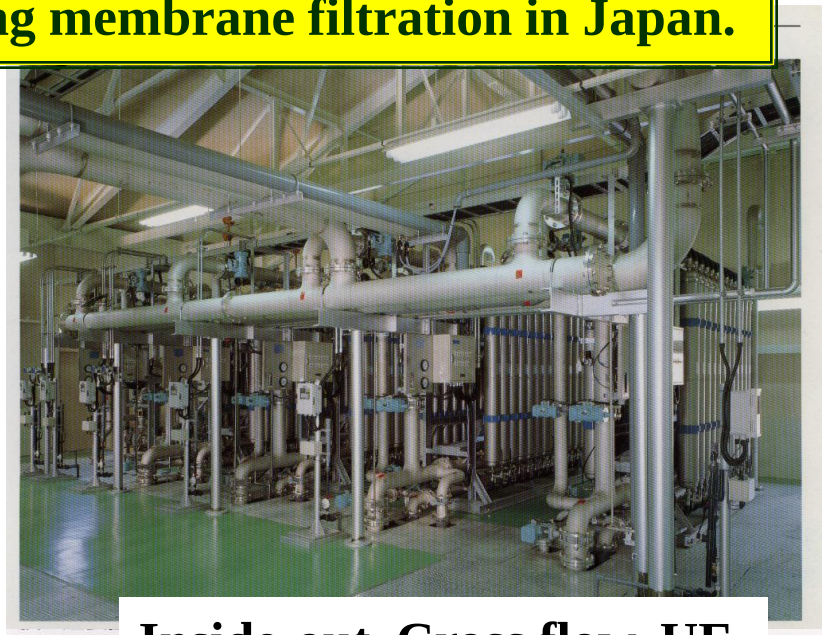
●Advantage
- High quality effluent (Cryptosporidium removal)
- Automated O & M

● Disadvantage
- Costly (membrane and energy)

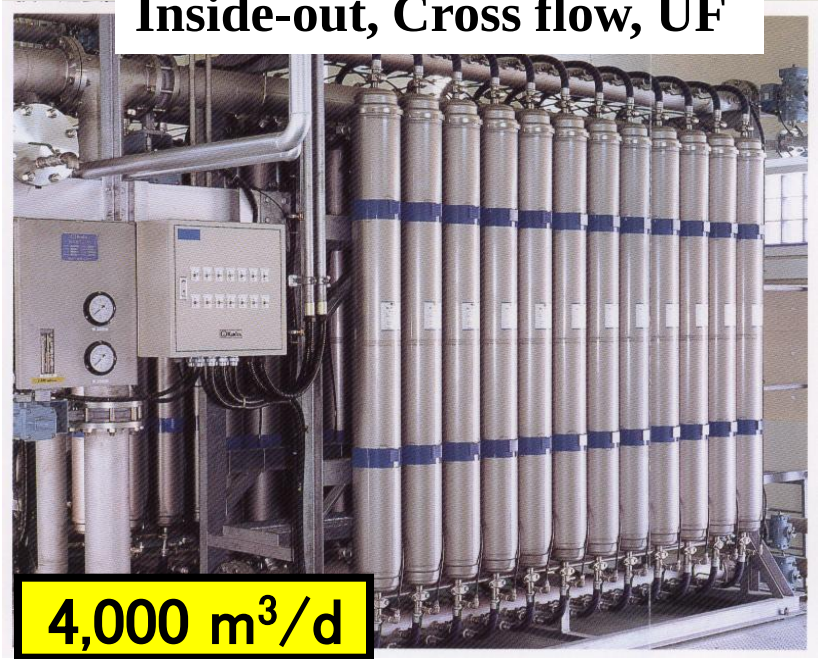
◆ Example (1) Potable water treatment with UF

First large potable water plant using membrane filtration in Japan.



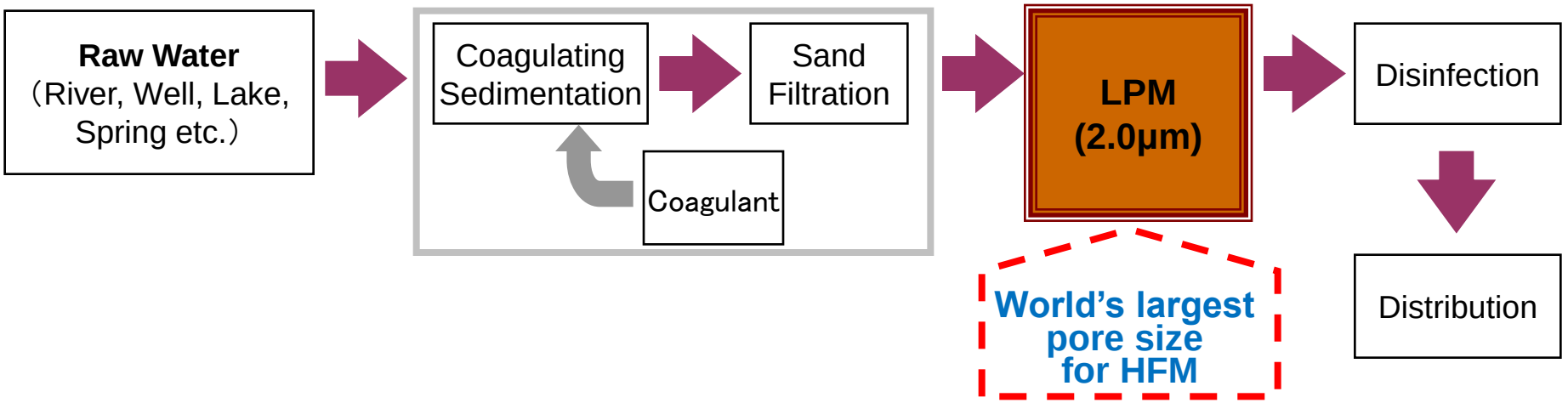


Inside-out, Cross flow, UF



Ogose Town, Saitama Pref.
Produced by Kurita Water Industries Ltd.

◆Membrane filtration with large pore membrane (LPM)

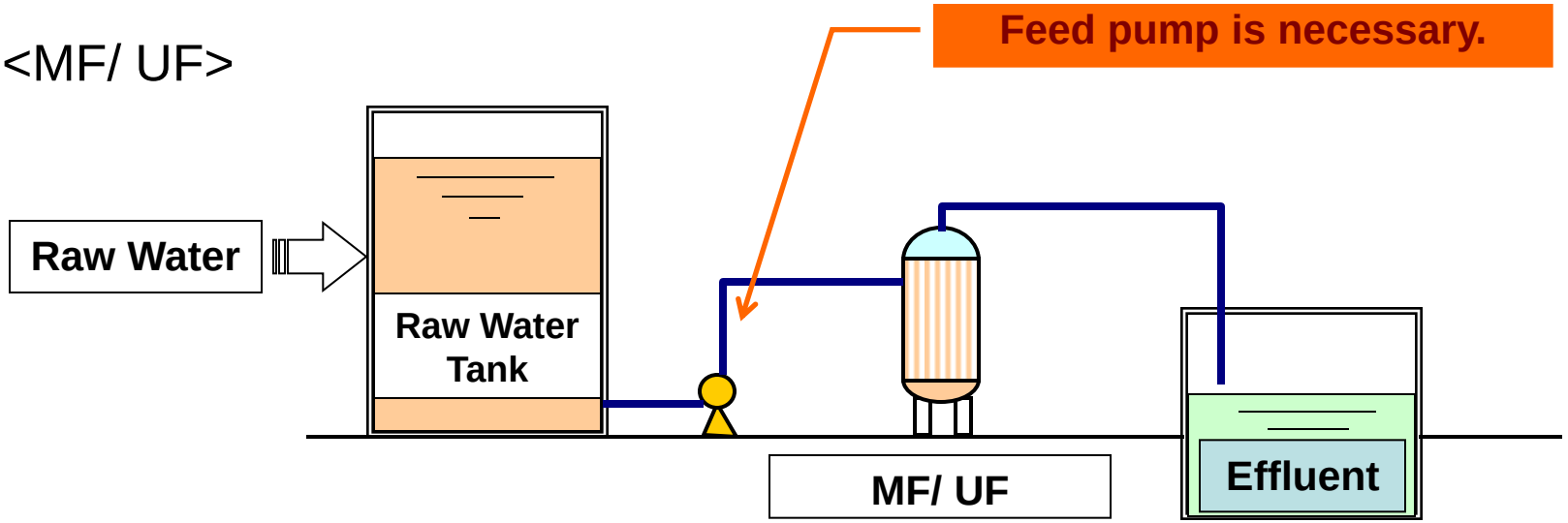


●Features

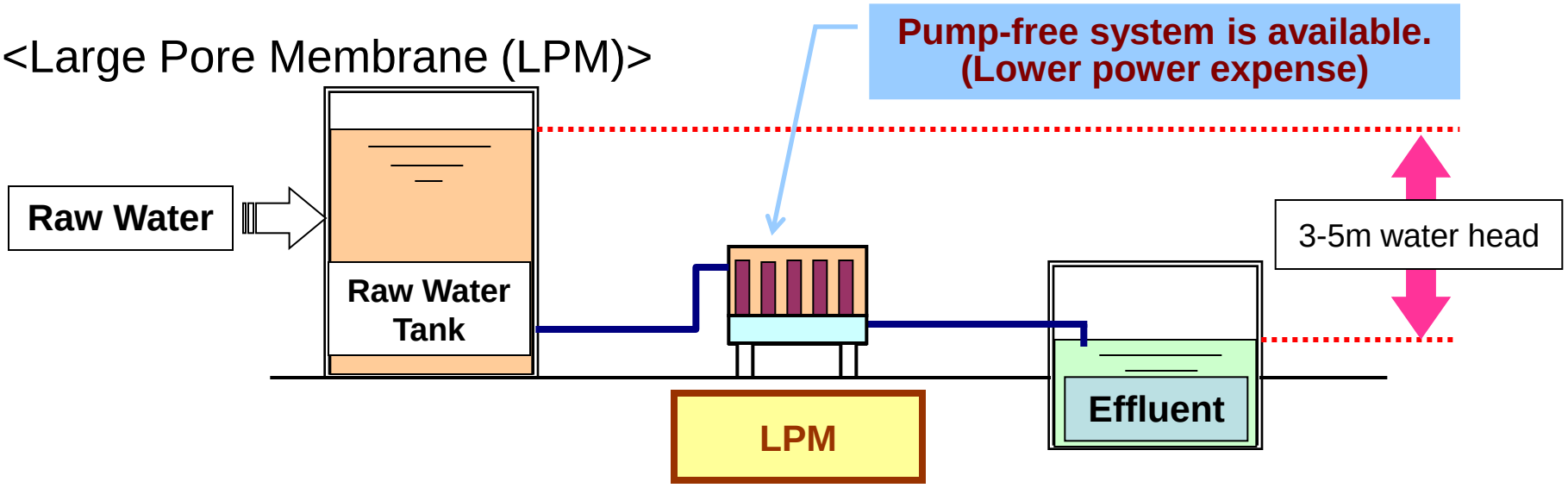
- Removal of pathogenic protozoa (Cryptosporidium)
- Post-treatment for existing plants
- Cost effective
  - Higher flux with smaller membrane area
  - Lower energy achieved by pump-free operation

◆Pump-free System

<MF/ UF>



<Large Pore Membrane (LPM)>

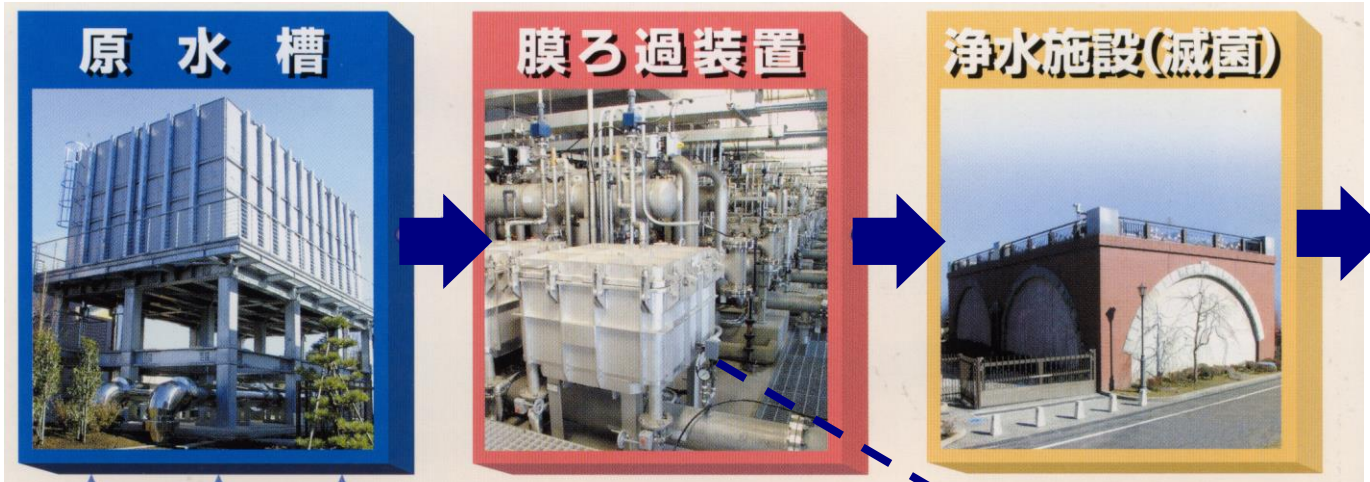


◆Example (2) Potable water treatment with LPM

Raw water tank

Filtration unit

Disinfection



30,000 m³/d

Distribution

Shallow well

Pump-free operation

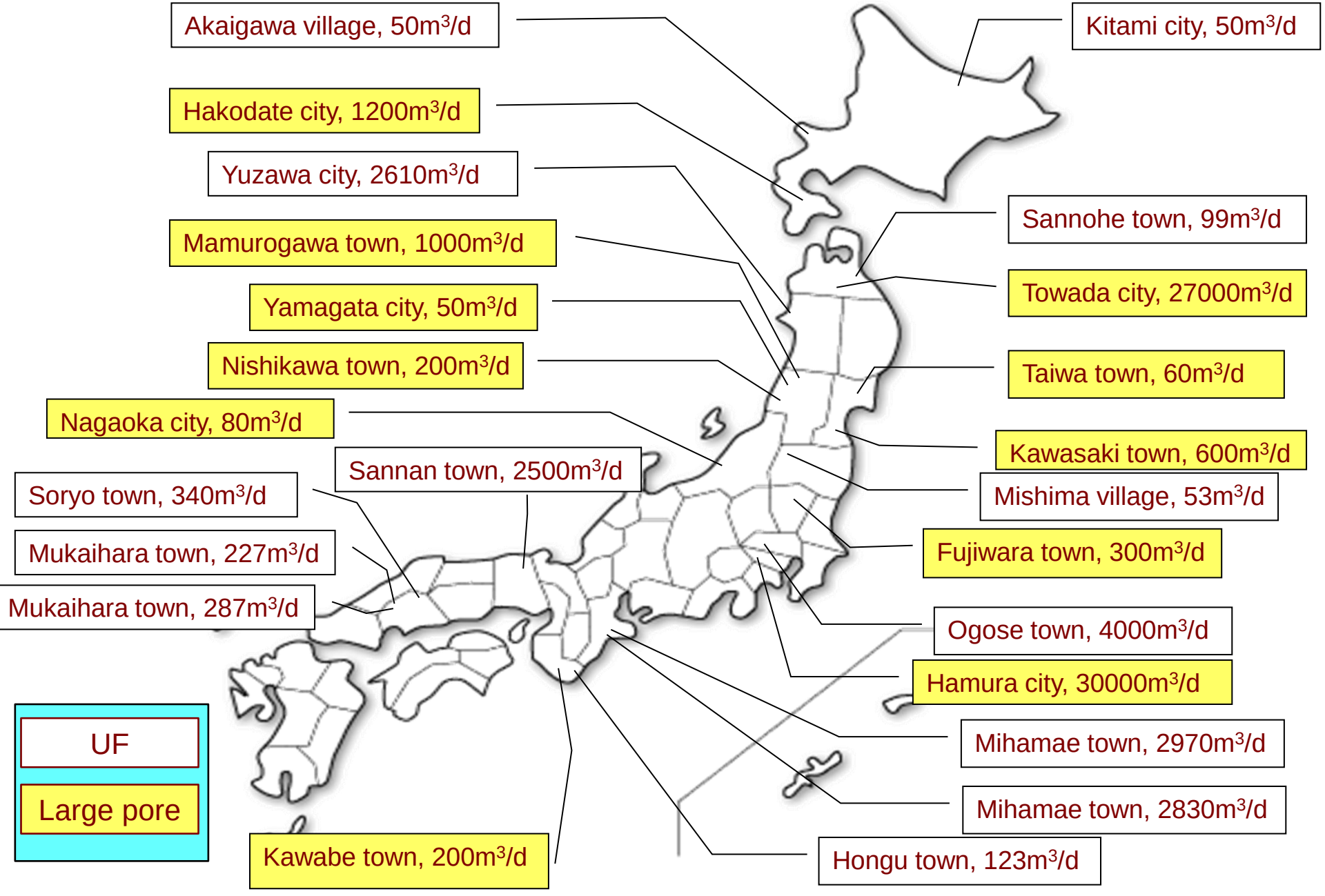




Hamura City, Tokyo Pref.

Produced by Suido Kiko Co., Ltd.

◆Delivery record for portable water treatment in Japan



4. Recycle

◆Filtration of Hot Water (Boiler Drainage)



SF module

with heat resistance up to 99 deg. C

Pore size: 0.1μm
Membrane surface area: 7 m^2
Filtration: Outside-in, dead-end





Employed by
the Japan Self Defense Force