

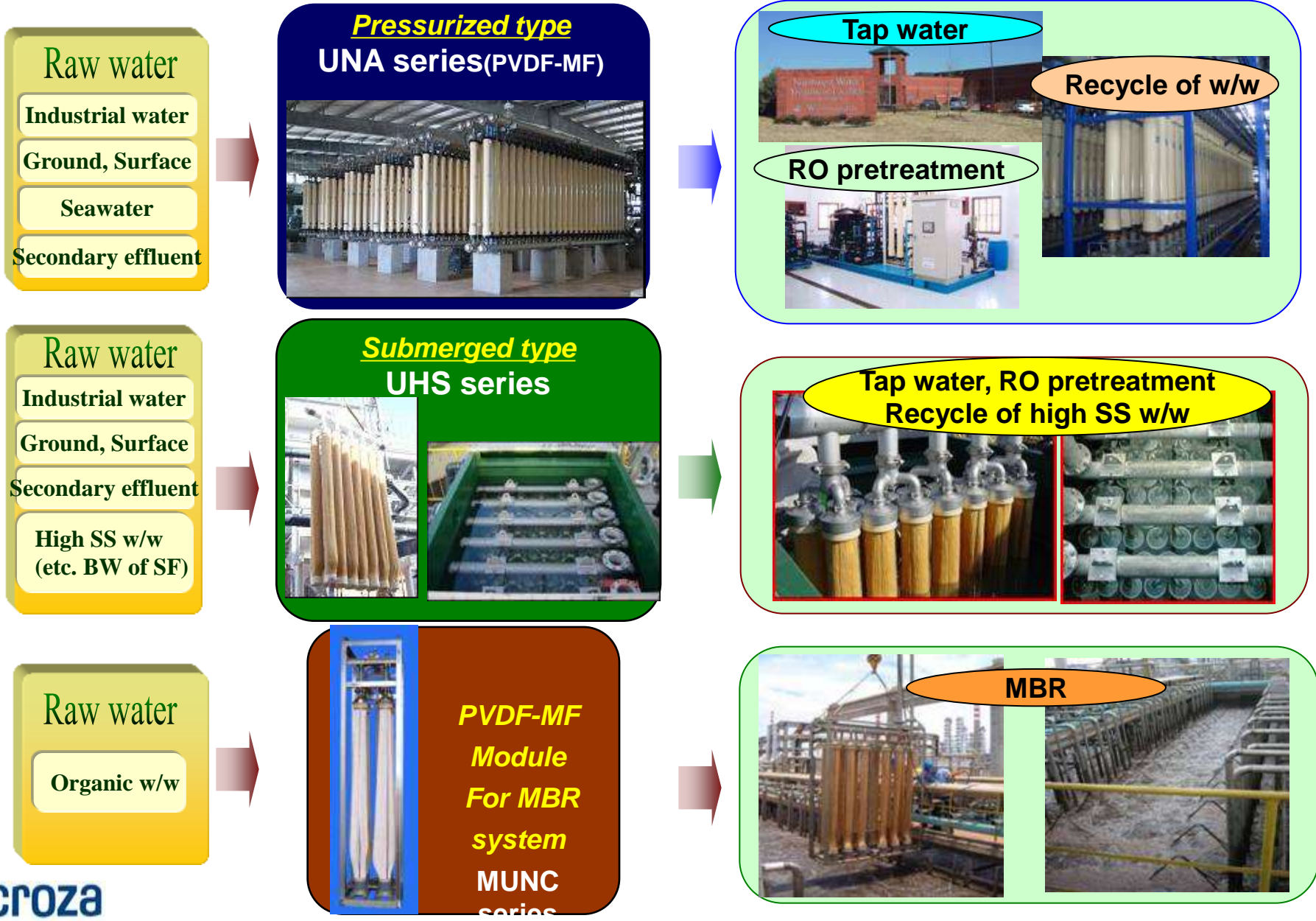


microza[®]

For Water & Waste Water Treatment

Asahi KASEI Corporation

Applications of Microza UF/MF



Microza UF/MF Key Figures

Core Values

High Performance & Long Lifetime

World Wide
Market Share

20%

Drinking Water
Market Share in USA

50%
No.1

Reference Sites

Over1,500

ASAHI KASEI CORPORATION

microza[®]

Requirements for UF membranes

Microza Features

Values

User needs

**High
Performance**

**Small
Footprint**

**CAPEX
Reduction**

**High
Durability
&
Chemical
Resistance**

Long Life

**OPEX
Reduction**

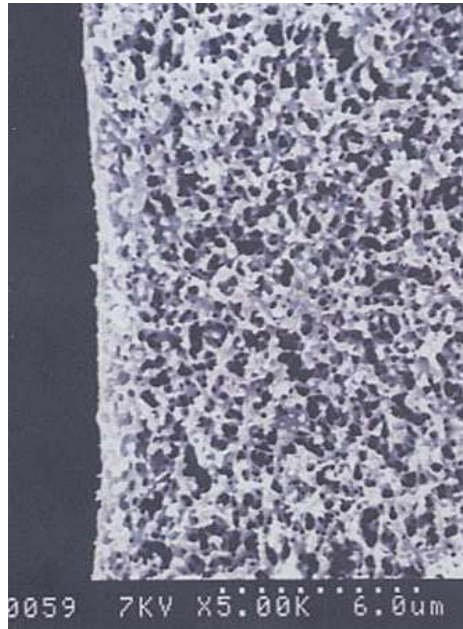
**Stable Treated
Water Quality**

**Reliable
Water**

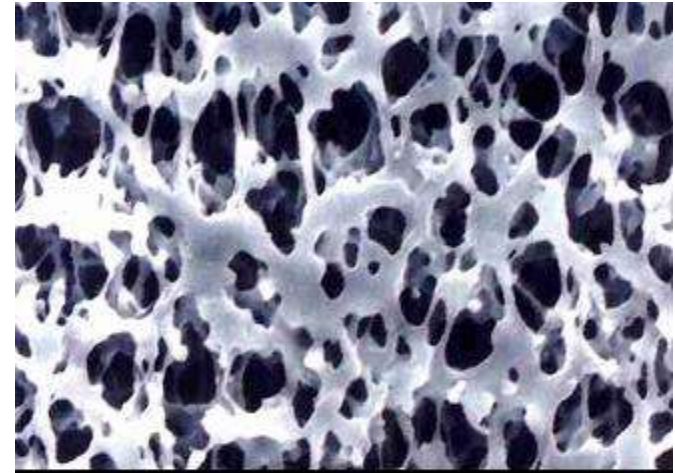


Microza TIPS* PVDF Hollow Fiber

*Thermal Induced Phase Separation



Symmetric layer



High Bonding Network Structure

- High mechanical strength
- High chemical resistance

5,000 ppm of Chlorine

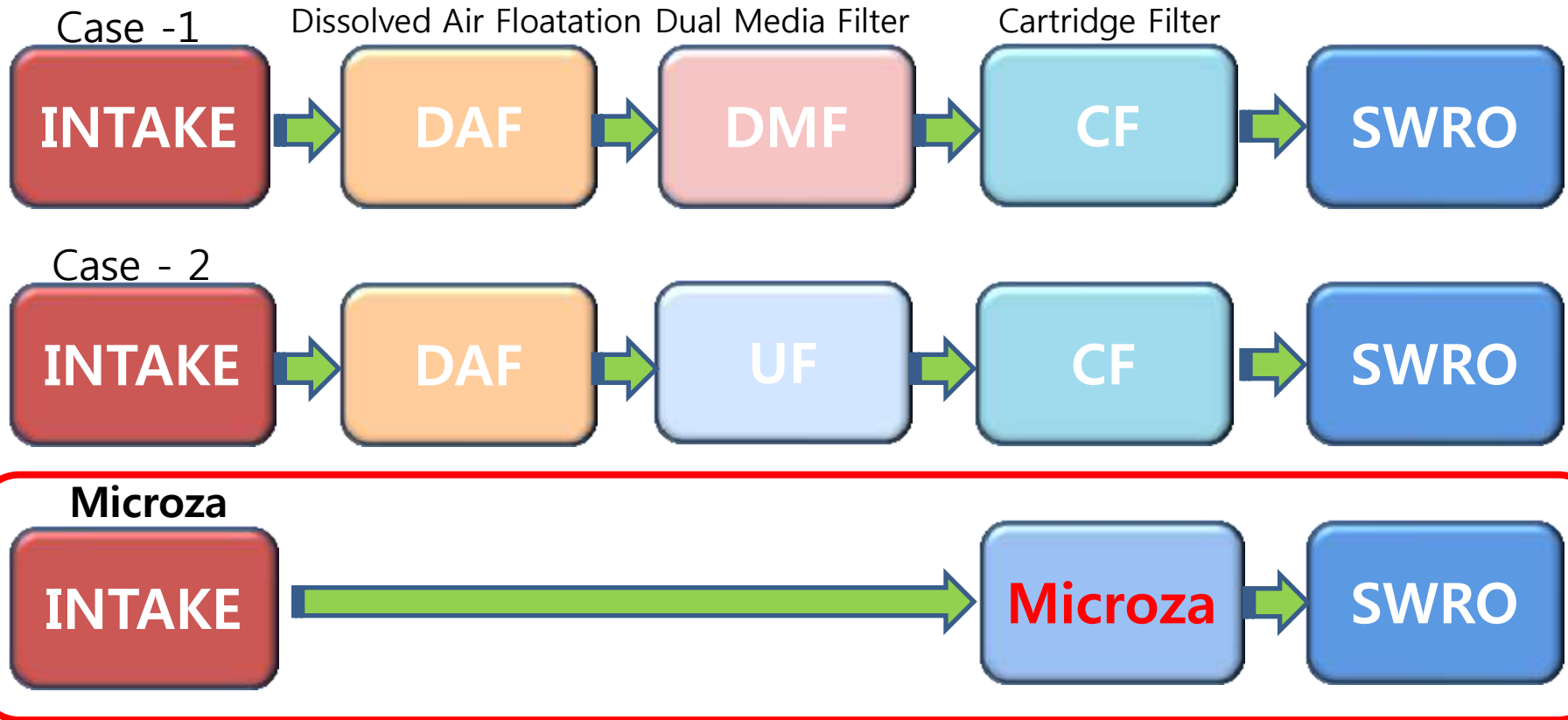
4% of NaOH

10% of HCl, H₂SO₄, Citric Acid



Long Lifetime

Desalination Process configuration with Microza



Oman Sohar Industrial Port 58MLD



Open Intake
Continuous Chlorination



Microza



SWRO

- ✓ Microza without DAF has been operating Since 2013.
- ✓ It's efficient even in Algae bloom event by adjusting cleaning regime.



Barka Expansion Phase 2 Oman
140,000m³/day as UF product
since Aug 2015



Duqm Desalination Oman
18,000m³/day as UF product
since Dec 2010



Singapore NEWater Sewage Effluent Recycle Plant

Indirect-Potable Use

- ✓ Reservoir recharge
- ✓ 5-10 % of treated water being injected into pond of WTP

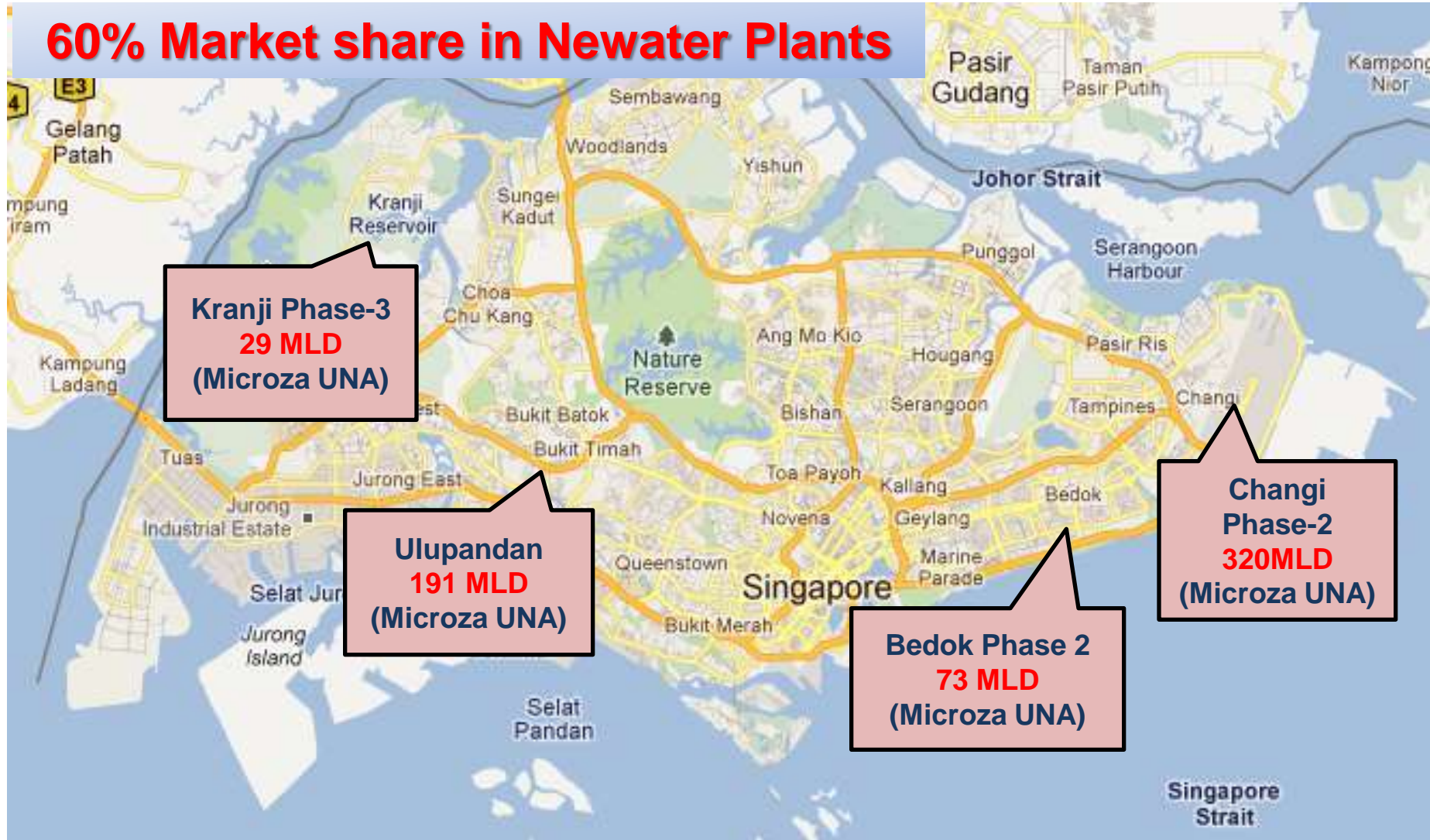


Direct Non-potable Use

- Wafer fabrication
- Power station
- Air-con cooling
- Landscaping

NEWater Plants in Singapore (2017. Feb)

60% Market share in Newater Plants





**Ulupandan 191,000 m³/day
Since 2007**



**Changi Phase 2 320,000m³/day
Since 2016**

2007	Ulupnadan	191 MLD	No replacement
2008	Bedok Phase II	73 MLD	No replacement
2016	Kranji Phase III	29 MLD	
2016	Changi Phase II	320 MLD	



Summary

- ✓ Microza employing TIPS PVDF membrane has significantly robust and chemical resistant.
- ✓ This features enable it to operate effectively in sea water desalination without conventional pre-treatment such as DAF, DMF even during red tide and algae bloom event.
- ✓ Microza has been proven most effective and longest lifetime in sewage effluent recycling plants in Singapore.