

**Multi-nuclide Removal Equipment
- Cause and Measure of the outflow
of carbonate slurry-**

May 23, 2014

Tokyo Electric Power Company



東京電力

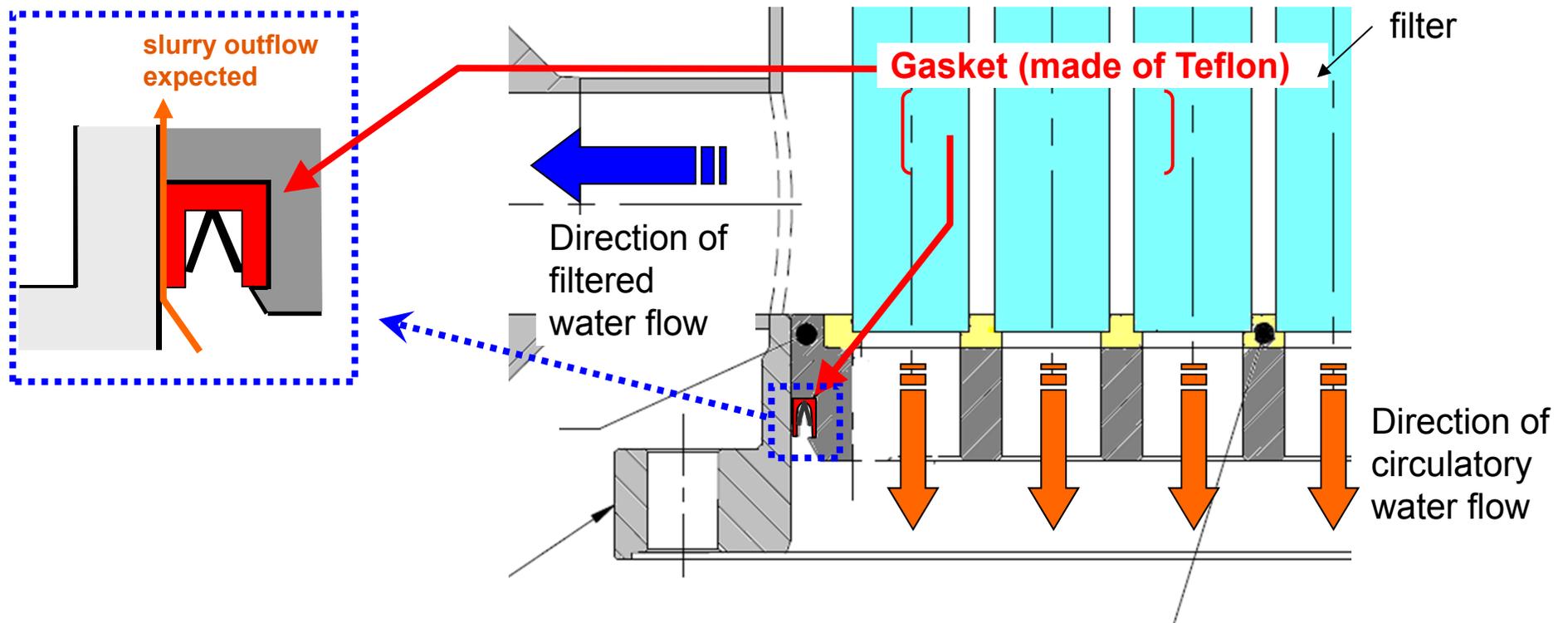
TEPCO

Summary

- On running Multi-nuclide Removal Equipment (Unit A, B, and C) , we found highly-concentrated radioactive material in the sample tank and treated water tank (J1), where the processed water of Unit B is stored.
- Unit B had been shut down for investigation. For the purpose of isolating the contaminated tank and the other treated water tank (J1), Unit A and C were also shut down.
- As a result of the investigation, the following explanation was made:
 - The packing of the filter of Unit B was deteriorated by radiation.
 - Consequently, slurry of carbonate containing radioactive material (mainly Sr) had moved to the treated side and flowed to the downstream.
- Improvements were made, replacing the filter packing with a more highly-resistant material one. On May 23, Unit B resumed processing.

Findings by the filter's overhaul

- We overhauled the filters and found there are defects, or micro scratches on the gasket. Slurry of carbonate is assumed to have flown through them to the downstream.

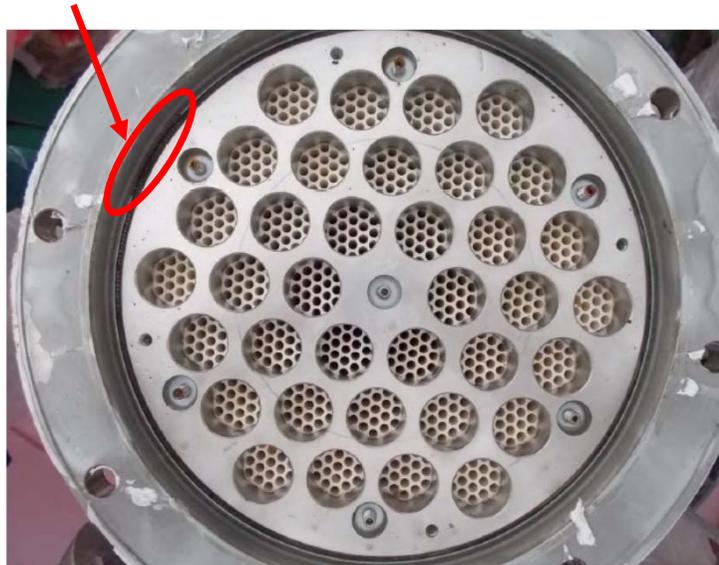


Outlet details

Defects found at the overhauled filter (3B cross flow filter)

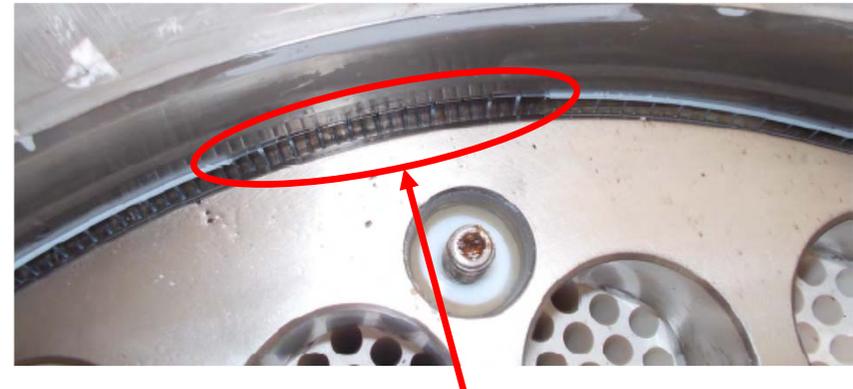
- A defect was identified on the gasket of the 3B cross flow filter.

Defect on the gasket



Whole filter plate

View from above



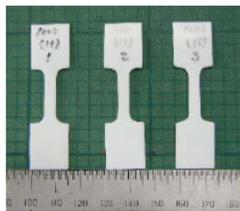
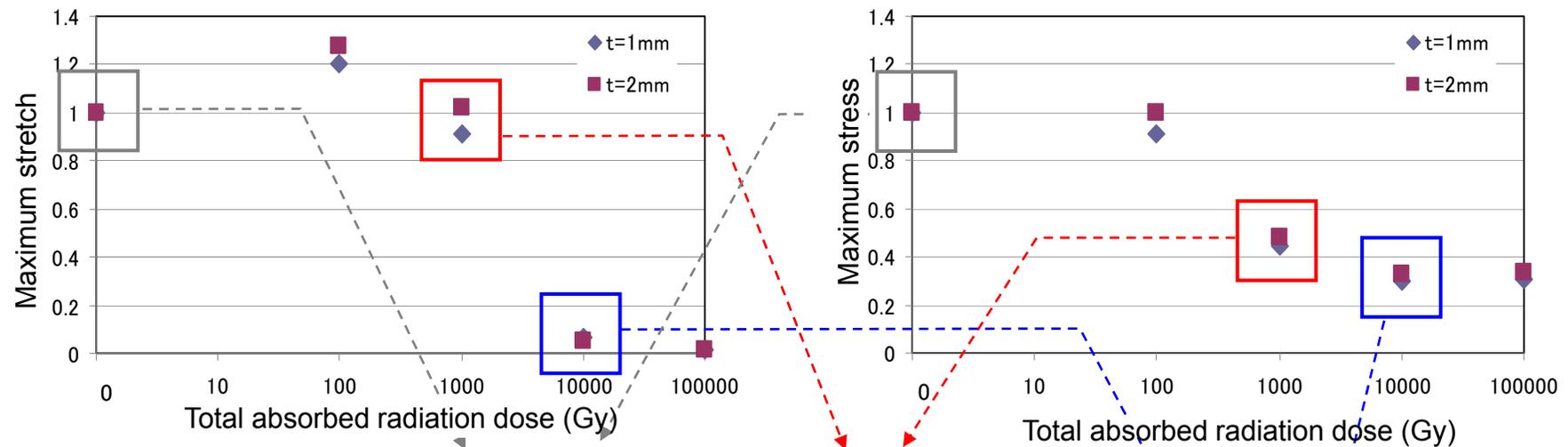
Defect: 6-cm width, 3-mm depth



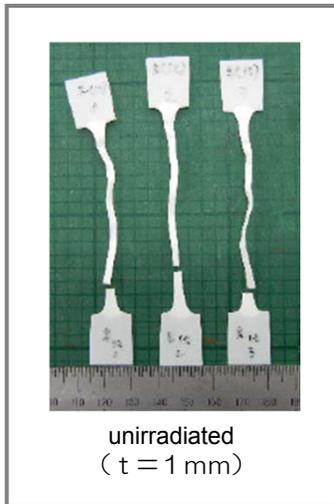
View from side

Irradiation Test Results

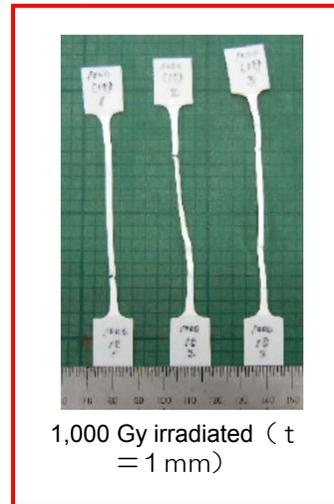
■ Radiated test results (PTFE (Teflon))



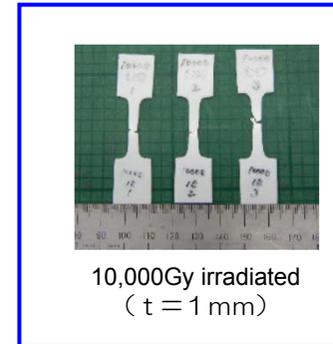
Before test
(t = 1 mm)



unirradiated
(t = 1 mm)



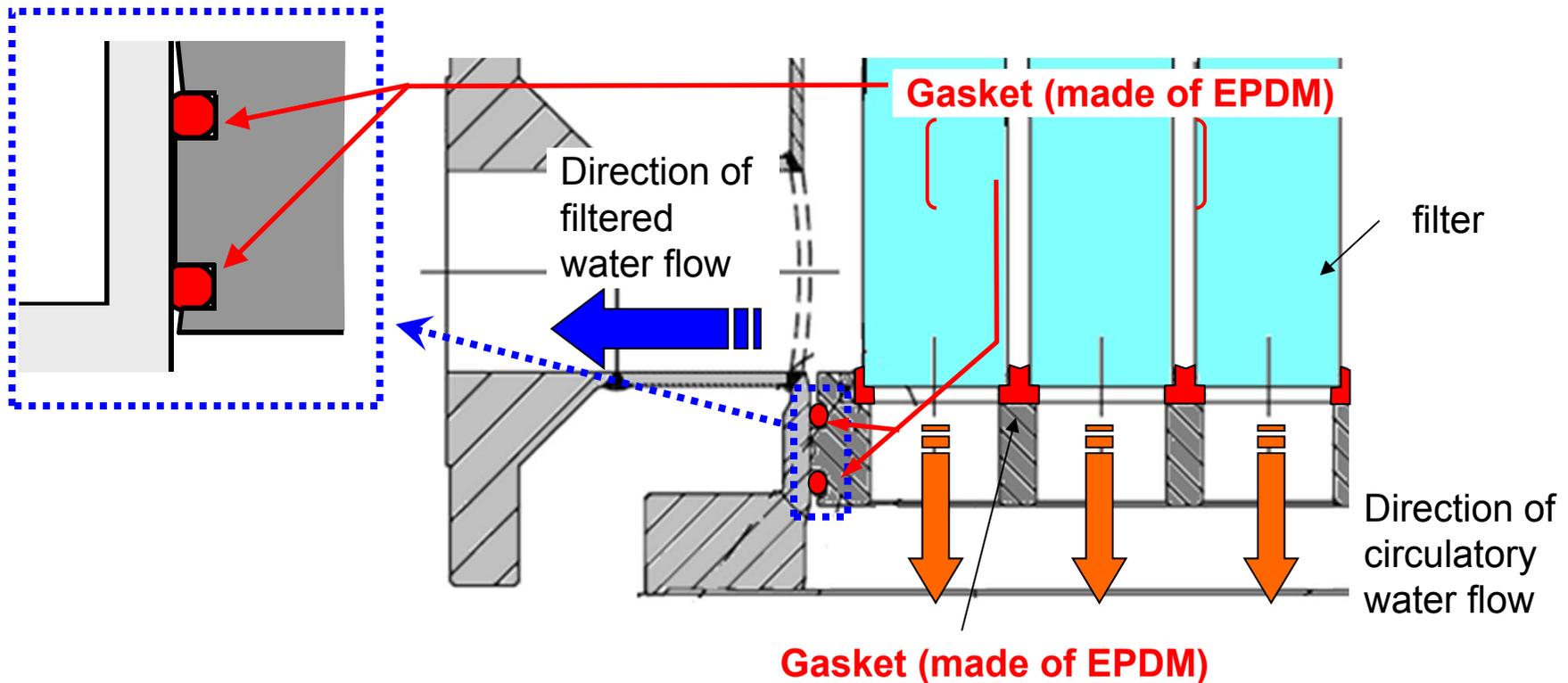
1,000 Gy irradiated (t = 1 mm)



10,000Gy irradiated
(t = 1 mm)

Recurrence prevention (adopting improved filter)

- Below improvement was made for the filter
 - Change the material of the gasket to a more highly-resistant **EPDM (synthetic gum)**



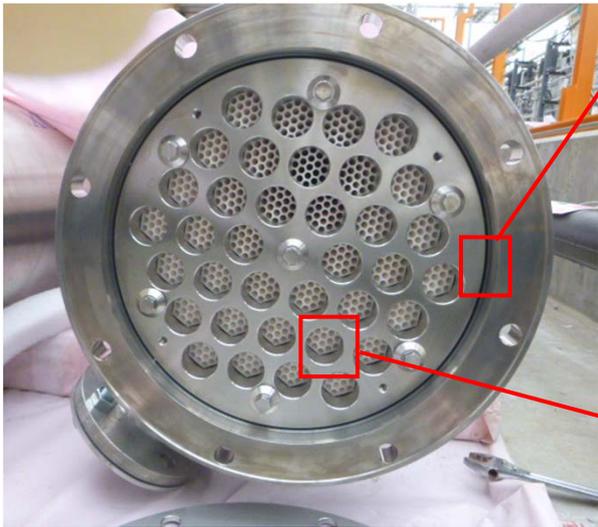
Outlet details of the improved filter

Recovery schedule

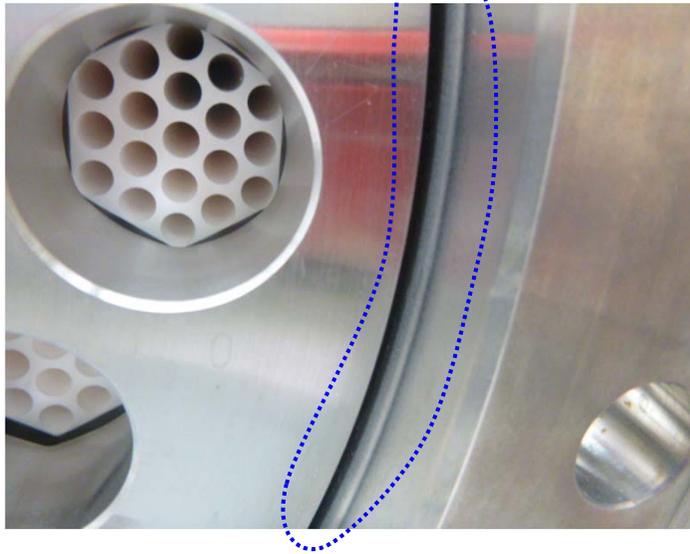
- For Unit B, exchanging filters to improved ones were conducted. It resumed operation on May 23.
- For Units A and C, filters will be exchanged, too. Unit A will restart operation in the beginning of June, and Unit C will restart operation in the middle of June.

	May			June	
	11	18	25	beginning	middle
Unit A	treatment running	Shutdown/changing filters		treatment running	
Unit B	Shutdown/washing in Group/changing filters		Washing circulator	treatment running	
Group C	treatment running	Shutdown/changing filters/confirming non-corroding effectiveness			treatment running

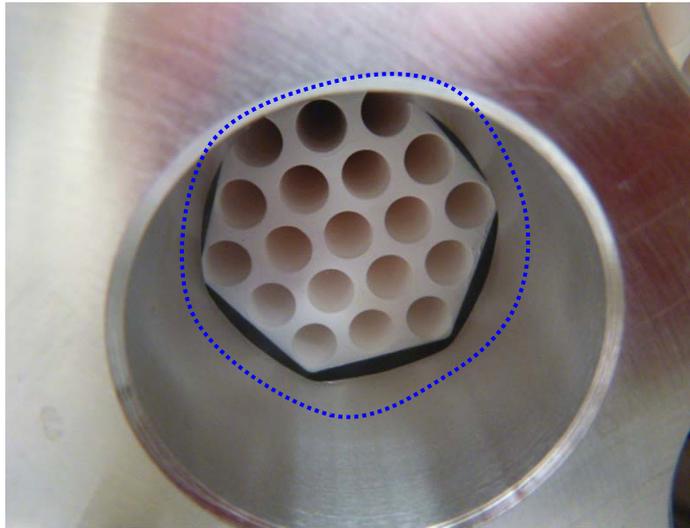
<Reference> Improved filter



Output side view



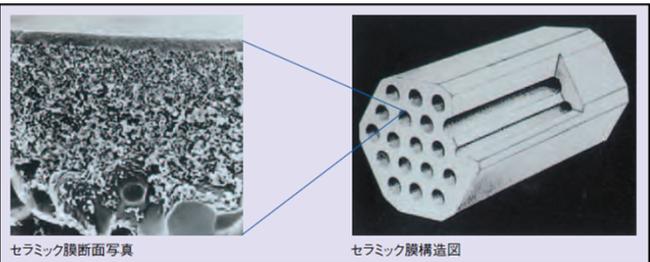
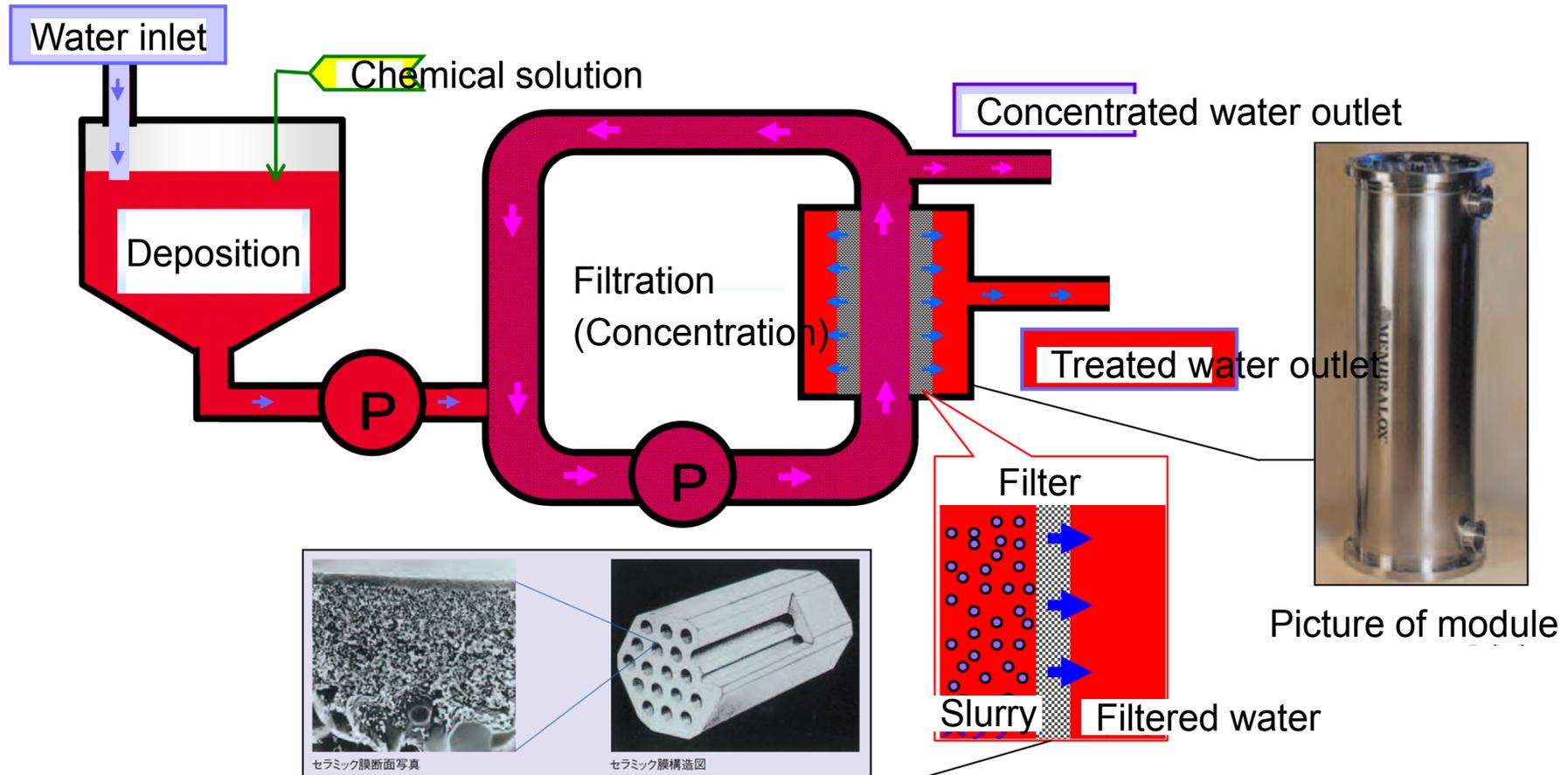
O-ring
made of
EPDM



Gasket
made of
EPDM

<Reference> Structure of the filter

- Sedimentation by infusing the chemical solution and controlling water quality, the solid material would be filtered.



セラミック膜断面写真

セラミック膜構造図

Detail of the filter *

*Abstracted from a catalog of Pall Corporation

<reference> outline of the filter

