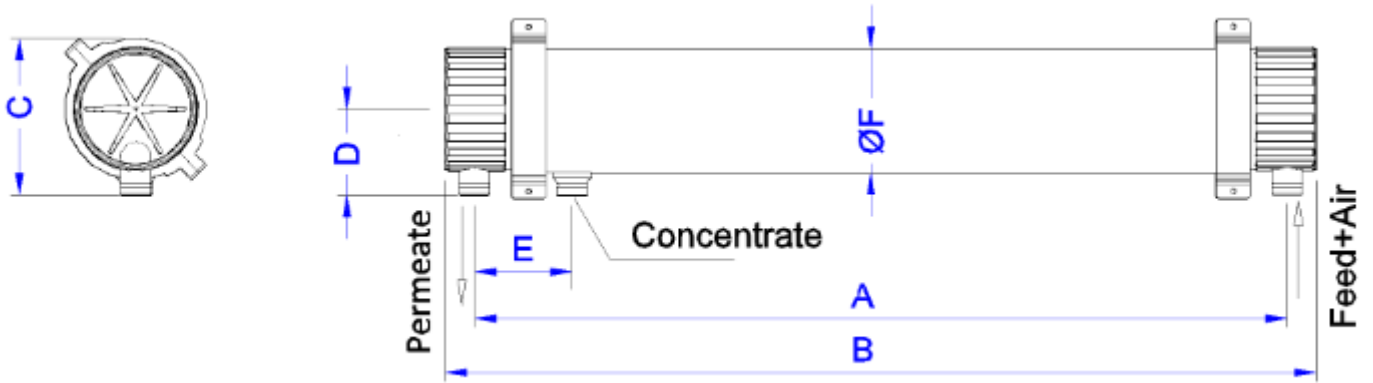


AKUALYS APM



Rev:191219000

TECHNICAL DATA SHEET



MODEL	Surface Area (m ²)	Dimensions (mm)						Weight (kg)
		A	B	C	D	E	ØF	
APM	80	1923±1	2042±1	314±1	172±1	205±1	250±1	58

A. SPECIFICATION

- Due to their high mechanical strength and chemical resistance, PVDF based hollow fiber membranes have long lifetime.
- Modified hollow fiber membranes have high permeability and 30nm nominal pore diameter.
- Hollow fiber membranes remove viruses, bacteria and particles including colloids.
- The produced water quality is <0,2 NTU.

Module Specifications

PARAMETER	UNIT	SPECIFICATION
Model	-	APM
Diameter	mm	250
Body and Cap Material	-	U-PVC
Nozzles	mm	DN50 - Victaulic
Potting Material	-	Polyurethane

• Membrane Specifications

PARAMETER	UNIT	SPECIFICATION
Material	-	Modified PVDF
Membrane Type	-	Hollow Fiber UF
Flow Direction	-	Outside to inside
Fiber Outside/Inside Diameter	mm	1,4 / 0,8
Active Surface Area	m ²	80
Nominal MWCO, Dextrane	Dalton	≤ 150.000



•Feed Water Specifications

PARAMETER	UNIT	SPECIFICATION
Temperature	°C	25 (Max 40)
Particle Dimension	μ	< 300
Turbidity	NTU	50 (Max 250)
Oil and Grease	%	0 (Max 1)
pH	-	6-9
TOC	mg/l	< 10 (Max 30)
Total Suspended Solid (TSS)	mg/l	50 (Max 80)
Chlorine	mg/l	0,4 (Instant Max. 150)

B. OPERATION

PARAMETER	UNIT	SPECIFICATION
Operation Modes	-	Dead End/Crossflow
Temperature	°C	1-40
pH	-	2 - 11
Filtrate Flux @25°C *	L/m ² h	45-180
Flow Capacity**	m ³ /h	3,60-14,40
Feed Water Inlet Pressure @ 25°C	bar	2-3 (Instant Max.5)
TMP	bar	0,4 - 2
Filtrate Water SDI	-	≤ 2,5
Filtrate Water Turbidity*	NTU	≤ 0,2

(*), (**) : Depend on feed water quality

C. CLEANING, DISINFECTION & PRESERVATIVE SOLUTION

PARAMETER	UNIT	SPECIFICATION
CLEANING		
Backwash Pressure	bar	Max. 2,5
Air Flowrate	Nm ³ /h	Max. 20
Chemically Enhanced Backwash (CEB)		
Sodium Hypochlorite (NaOCl)	mg/l	1000
Sodium Hydroxide (NaOH)	mg/l	500
Hydrochloric Acid (HCl)	mg/l	1000
Citric Acid	%	1-2
Clean-in-Place (CIP)		
Frequency	Current Process TMP(bar) ≥ Initial TMP(bar) + 0,9bar	
Operation Duration	2 hours	
Chemical Cleaning Solutions (depend on pollutant)	1. % 0,1 NaOH + 0,2% NaOCl 2. % 0,2 HCl, 2% Citric Acid	
Cleaning Flowrate per Module	1-2 m ³ /h	

GUIDELINES

- Follow the guidelines to avoid membrane deformation and to preserve membrane performance.
- It is mandatory; in initial production, the permeate water and preservative solution must be operated at half capacity until completely drained.
- Do not operate the module above the pressure limits to avoid membrane deformation.
- To obtain designed production capacity and designed water quality the operation parameters must be kept.
- Cleaning of preservative solution and cleaning-disinfection must be done according to below given instructions.
- The module must be filled with storage/ preservative solution during shut-down.

Cleaning of Preservative Solution

- Preservative solution is composed of water / glycerol/ sodium metabisulfite.
- For the cleaning the module is drained with feed water and the cleaning duration is minimum 4 hours.
- The feed water specifications must be kept and the used feed water volume must be at least 14 m³.

Cleaning - Disinfection

- The module should be chemically disinfected against biological contamination.
- 100 ppm sodium hypochlorite solution is circulated for 10 minutes.
- The solution should wait for 1 hour inside the module.
- After disinfection the module must be drained until the filtrate line is free from chlorine.

NOTE: Backwash procedure with treated/clean water at start-up process is advised.

D. PROCESS STEPS

- Valve positions and specifications must be kept.
- CEB frequency must be defined according to feed water quality.
- Chemical solution is either filled in the module or is circulated by using a vessel and a pump up to 2 hours.

Valve Position:

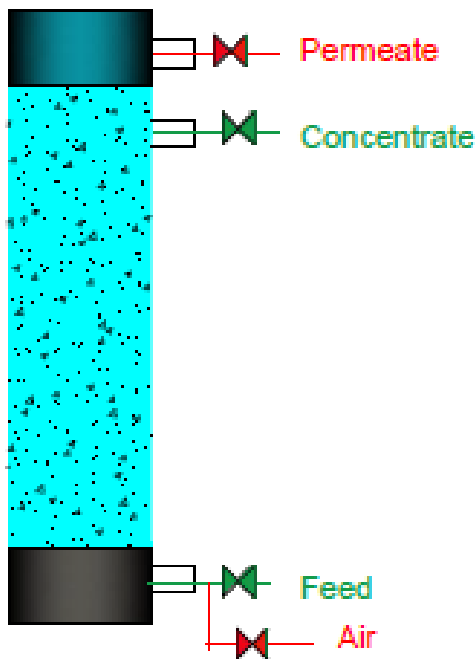
Open

Closed

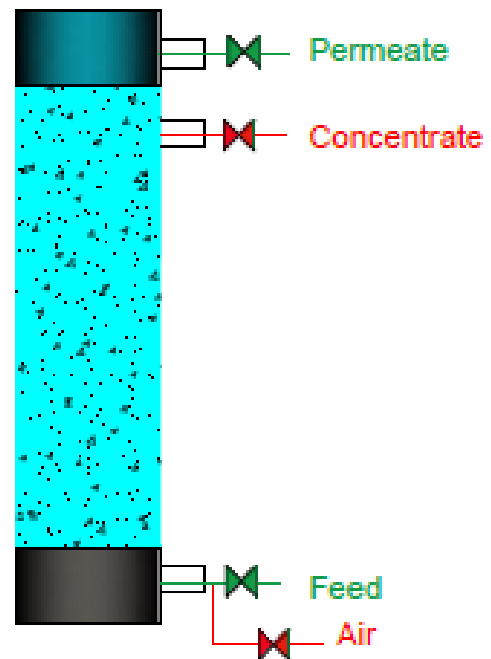
1. PRODUCTION

1.1.Forward Flush: The module is rinsed with feed water.

1.2.Filtration: The production is done.



1.1 Forward Flush



1.2 Filtration

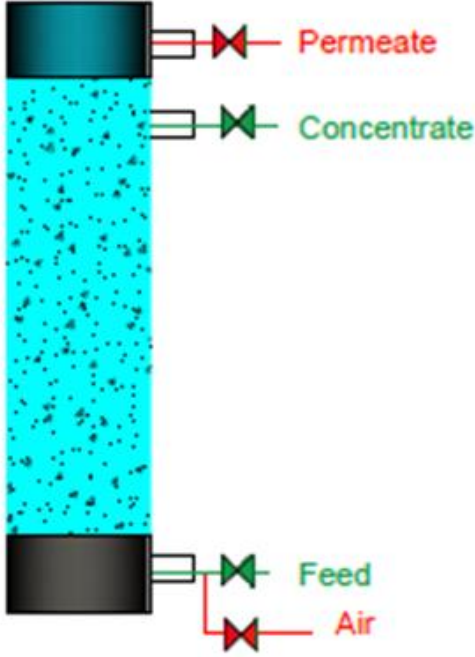
2.BACKWASH

2.1.Drain: The module is drained.

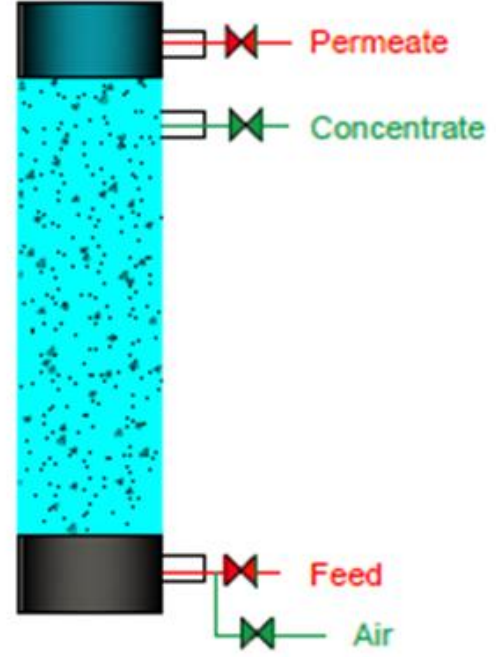
2.2.Air Scourge: The membranes are scoured by air.

2.3.Backwash-Bottom: The module is rinsed with permeate water. Flow direction is from top to bottom.

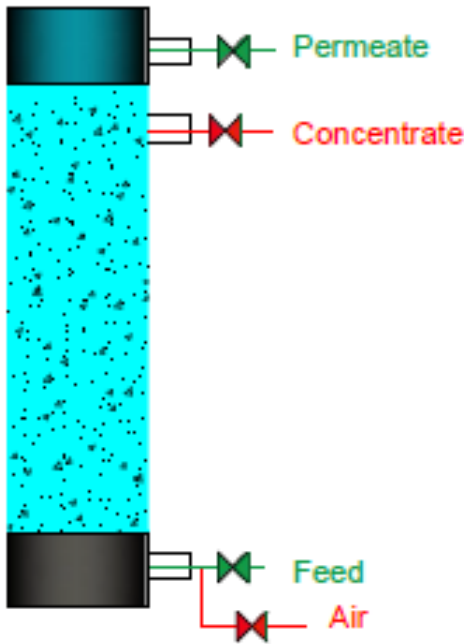
2.4.Backwash-Top: The module is rinsed with permeate water.



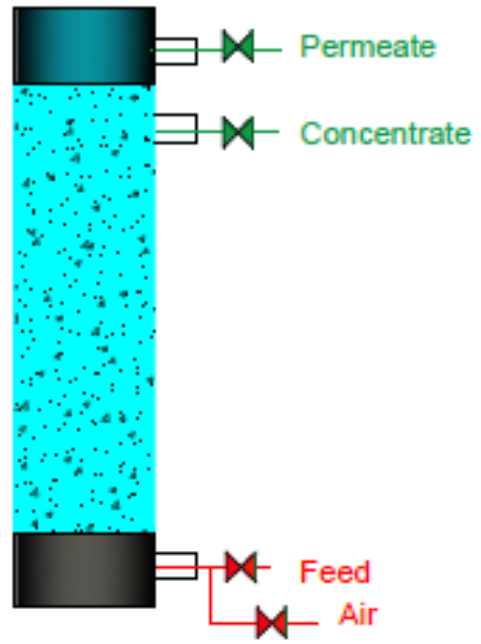
2.1 Drain



2.2 Air Scourge



2.3 BW Bottom



2.4 BW Top

3.CEB (CAUSTIC/CHLOR/ACID)

3.1.Drain: The module is drained.

3.2.Air Scourge: The membranes are scoured by air.

3.3.Backwash-Bottom: The module is rinsed with permeate water and chemical.

Flow direction is from top to bottom.

3.4.Backwash-Top: The module is rinsed with permeate water and chemical.

3.5.Soak: All valves are in closed position. The membranes are soaked.

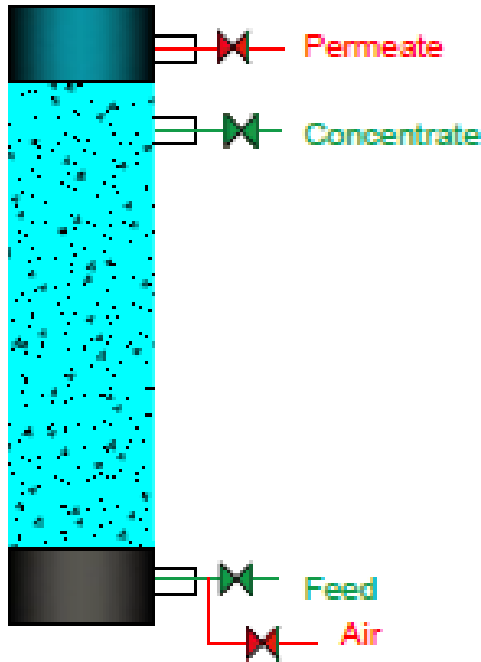
3.6.Drain: The module is drained.

3.7.Air Scourge: The membranes are scoured by air.

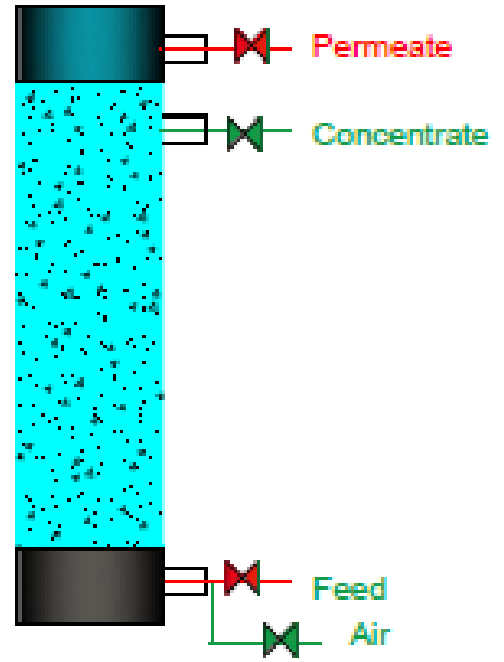
3.8.Backwash-Bottom: The module is rinsed with permeate water. Flow direction is from top to bottom.

3.9.Backwash-Top: The module is rinsed with permeate water.

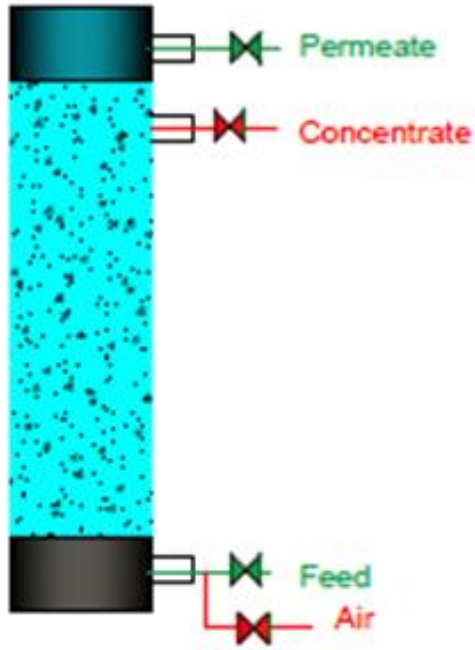
3.10.Forward Flush: The module is rinsed with feed water.



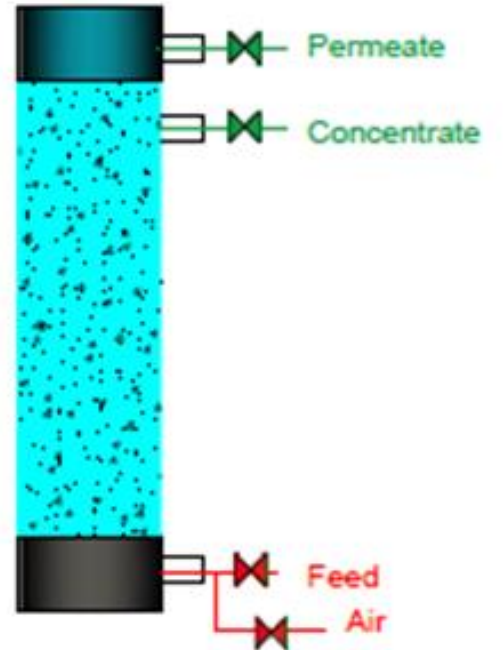
3.1 Drain



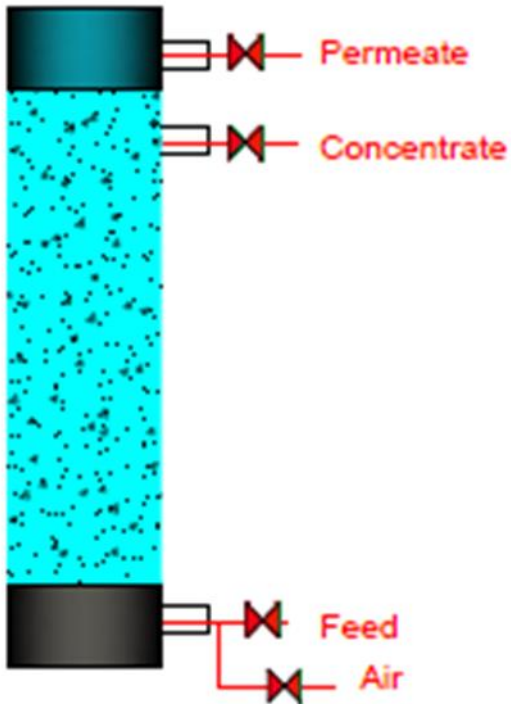
3.2 Air Scourge



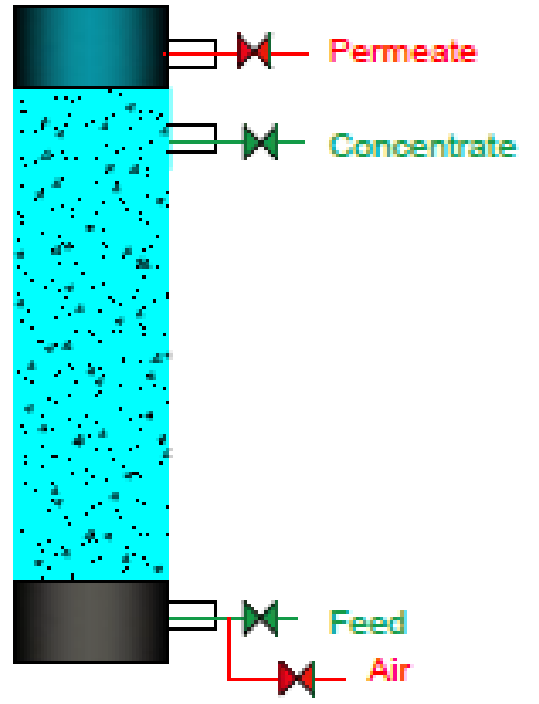
3.3 BW Bottom



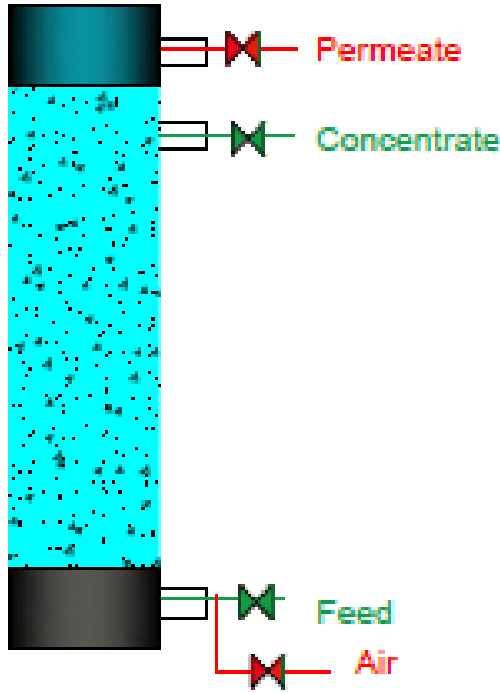
3.4 BW Top



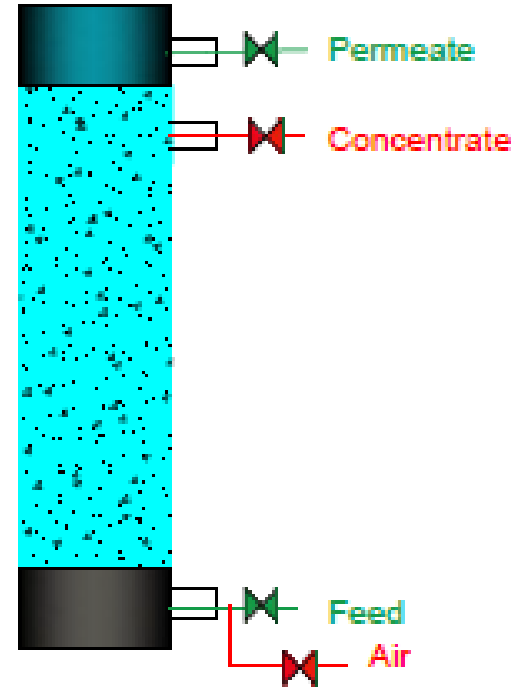
3.5 Soak



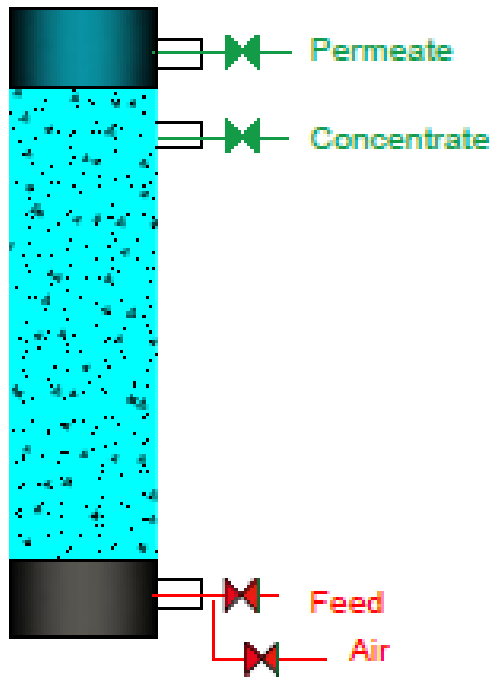
3.6 Drain



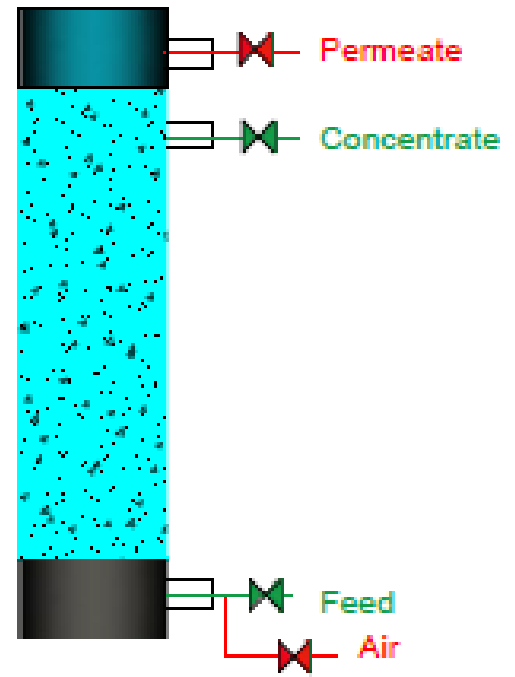
3.7 Air Scourge



3.8 BW Bottom



3.9 BW Top



3.10 Forward Flush

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