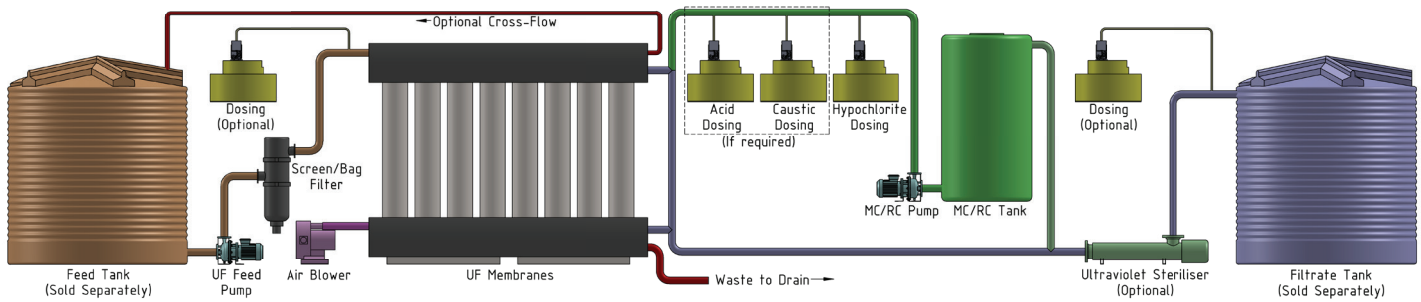# PRODUCT DATA SHEET

Ultra Filtration (UF)

water | wastewater | sewage

OVERVIEW

MAK Water's Ultrafiltration (UF) plants are designed to treat ground water, surface water, tertiary treated effluent, storm water or wastewater with turbidity <300 NTU. The standard treatment process includes pre-screening (bag filter or self-cleaning screen filter), outside-to-inside capillary ultrafiltration modules, automated air scouring and maintenance cleaning (MC) system, as well as a CIP system for periodic recovery cleaning (RC). The UF system can be configured as either: dead-end for lower turbidity applications, or cross-flow for higher turbidity applications.

Additional pre-filtration and post-filtration treatment steps may be added as required to suit feed water conditions and/or treated water quality requirements. The MAK Water UF plants are available as skid mounted or containerised systems.

STANDARD SPECIFICATIONS

Parameter		Units	UF-0100	UF-0200	UF-0500	UF-1000	UF-2000	UF-3500	UF-5000
Filtrate flow rate (min/max)[1]	Low turbidity feed (<100 NTU)	m³/day	54~100	108~200	269~500	538~1,000	1,077~2,000	1,077~3,500	2,692~5,000
	High turbidity feed (<300 NTU)		37~69	74~138	185~346	369~692	738~1,385	1,292~2,423	1,846~3,462
Power consumption[2]	Plant / equipment	kW	1.7	3.5	4.4	8.0	11.5	15.5	22.5
	Air conditioned containers[3]		1.9 per 20' container, 3.8 per 40' container (includes internal lighting)						
Power supply		-	AC 415 V, 3 Phase, 50 Hz						
Recovery rate[1]	Low turbidity feed (<100 NTU)	%	92~98% (dead-end configuration)						
	High turbidity feed (<300 NTU)		88~92% (cross-flow configuration)						
Average gross flux[1]	Low turbidity feed (<100 NTU)	L/m²/hr	35~65 (dead-end configuration)						
	High turbidity feed (<300 NTU)		24~45 (cross-flow configuration)						
UF membrane pore size		µm	0.08						
UV dose rate[1]		mJ/cm²	Typical >40 @ 90% UVT						
Pressure	Feed water inlet	kPa	>20 (flooded suction)						
	Filtrate discharge		150~200						
	Wastewater discharge		0 (gravity drain)						
Ambient temperature (min/max)	Skid mounted	°C	5~30						
	Containerised		-5~40						
	Containerised with insulation		-15~50						

Characteristics		Units	Feed Water	Filtrate
Temperature		°C	5~40	
Turbidity	Dead-end configuration	NTU	<100	<0.2
	Cross-flow configuration		<300[3]	<0.2
Total suspended solids (TSS)	Dead-end configuration	NTU	<100	<1
	Cross-flow configuration		<300	<1
Biological oxygen demand (BOD)		mg/L	<20[3]	-
Chemical oxygen demand (COD)		mg/L	<200[3]	-
Total organic carbon (TOC)		mg/L	<15[3]	-
Emulsified oil and grease		mg/L	<2.0[3]	-
Free oil and grease		mg/L	<0.1[3]	-
Bacteria removal (UF membrane only)		log	-	≥4[4]
Virus removal (UF membrane only)		log	-	≥1[4]

[1] Values dependent on water quality and may differ between applications, [2] Based on standard equipment supply, [3] Higher values can be treated; consult MAK Water, [4] Additional log credits are available with UV and chlorination; consult MAK Water

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STANDARD INCLUSIONS + OPTIONS

✓= Standard Supply, o = Optional Supply, - = Not Applicable

Equipment		UF-0100	UF -0200	UF-0500	UF-1000	UF-2000	UF-3500	UF-5000
Skid mounted plant / equipment		✓	✓	✓	✓	✓	✓	✓
UF feed pump		✓	✓	✓	✓	✓	✓	✓
UF modules		✓	✓	✓	✓	✓	✓	✓
Pre-screen	Bag filter or equivalent	✓	✓	✓	-	-	-	-
	Self-cleaning screen filter	o	o	o	✓	✓	✓	✓
UF membrane cleaning system	MC/RC tank	✓	✓	✓	✓	✓	✓	✓
	MC/RC pump	✓	✓	✓	✓	✓	✓	✓
	Air scour blower[*1]	o	o	o	o	o	o	o
	Hypochlorite dosing system	✓	✓	✓	✓	✓	✓	✓
	Acid dosing system	o	o	o	o	o	o	o
	Caustic dosing system	o	o	o	o	o	o	o
UV steriliser (non-validated[*2])		o	o	o	o	o	o	o
Feed and/or treated water chemical dosing systems(s)		o	o	o	o	o	o	o
Actuated valves	Electrically actuated	✓	✓	✓	o	-	-	-
	Pneumatic air actuated	-	-	-	✓	✓	✓	✓
Air compressor with refrigeration dryer		-	-	-	✓	✓	✓	✓
uPVC / HDPE inlet and outlet pipework / manifolds, manual isolation and sampling valves		✓	✓	✓	✓	✓	✓	✓
Containerised with A/C, overhead lighting & GPOs for maintenance	Standard supply	o	o	o	o	o	o	o
	With non-slip floor coating	o	o	o	o	o	o	o
	With non-slip floor coating and insulation	o	o	o	o	o	o	o
PLC control system with touch screen HMI		✓	✓	✓	✓	✓	✓	✓
Instrumentation	Standard package	✓	✓	✓	✓	✓	✓	✓
	Premium package with ClearAccess™ remote monitoring	o	o	o	o	o	o	o

Instrumentation & Controls	Standard Package	Premium Package
Feed & treated water tank float level switches	✓	-
Feed & treated water tank float level transmitters	-	✓
Chemical dosing & MC/RC tank float level switches	✓	✓
Pressure switches (air scour and MC/RC pump)	✓	✓
Pressure gauges	✓	-
Pressure indicating transmitters (UF feed and filtrate)	-	✓
Filtrate flow gauge (rotameter)	✓ (≤UF-0500 only)	-
Magnetic flow transmitter (treated water and cross flow recycle)	✓ (>UF-0500 only)	✓
pH transmitter (with feed or filtrate acid or caustic dosing)	✓	✓
Filtrate turbidity analyser (treated water)	-	✓
UV intensity sensor/monitor (with UV steriliser)	-	✓
ClearAccess™ remote monitoring & control capabilities	-	✓

[*1] Client to provide suitable compressed air supply if air scour blower is excluded, [*2] Validated systems available on request

MODEL SELECTION

100	Capacity - 100 m³/day (max)
200	Capacity - 200 m³/day (max)
500	Capacity - 500 m³/day (max)
1000	Capacity - 1,000 m³/day (max)
2500	Capacity - 2,000 m³/day (max)
3500	Capacity - 3,500 m³/day (max)
5000	Capacity - 5,000 m³/day (max)
XXXX	Capacity - specify m³/day (max)

- **XX** Assembly - skid mounted
- **CX** Assembly - containerised - standard
- **CF** Assembly - containerised - with floor coatings
- **CP** Assembly - containerised - with floor coatings & insulation
- **B** Pre-screen – bag filter
- **A** Pre-screen – self-cleaning screen filter
- **X** Pre-filtration chemical dosing – without
- **C** Pre-filtration chemical dosing – with (specify)
- **D** Membrane configuration – dead end
- **R** Membrane configuration – cross flow
- **S** Membrane MC/RC – hypochlorite dosing
- **D** Membrane MC/RC – hypochlorite + acid or caustic dosing
- **T** Membrane MC/RC – hypochlorite + acid + caustic dosing
- **X** Auto membrane integrity testing – without
- **I** Auto membrane integrity testing – with
- **X** Air scour blower – without (client to supply compressed air)
- **L** Air scour blower – with
- **X** UV steriliser – without
- **U** UV steriliser – with
- **X** Post-filtration chemical dosing – without
- **C** Post -filtration chemical dosing – with (specify)
- **X** Standard instrument package
- **P** Premium instrumentation package
- **C** Custom instrumentation (specify)
- **X** Specifications – standard
- **C** Specifications – custom

UF _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Disclaimer: MAK Water is continuously updating and improving its products and services, so please contact us for more detailed information or to confirm specifications. MAK Water takes no responsibility for any errors resulting from the use of information contained within this document .

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