DMDT

Dalahoo Membrane Development Technology

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Company Profile

DMDT Company, the first company that manufactures Reverse Osmosis membranes in Iran, was established in 2012. Regarding raising water demands due to population growth, climate change issue, economic growth, water resources contamination, and water scarcity in the most regions of Iran, offering high-performing ultrafiltration, nanofiltration, and reverse osmosis products can mitigate water crisis. State-of-the-art membranes manufactured by DMDT can be utilized in different sectors, including municipal, industry, power stations, irrigation, and others.

DMDT has developed various RO membranes, including residential, commercial, and industrial that can be used for treatment of brackish water and sea water. The manufactured RO membrane in DMDT are in the shape of flat sheet of thin composite membranes that consist of an active polyamide layer which is supported by a porous polysulphone layer wound round a central collection tube. Production of NF and UF membranes at DMDT will be part of the company development plan in the future.

DMDT operates its manufacturing base in Eyvan Industrial area, Ilam Province, Iran, covering an area of 7 Hectares, with an industrial area of 4,256 square meters. Adhering to the idea of "Fully-automatic Equipment, high-standard production environment and strict quality control, DMDT has set up a fully-automatic membrane sheet producing line and a fully-automatic spiral-winding line with core technologies. The company will, as always, fulfill its social responsibility relying on the well-equipped clean production environment and effluent production in accordance with Iran's environmental regulations.

Residential RO	ULP1812- 50 ULP2012- 100 ULP3012- 300 ULP3013- 400
Commercial RO	SW11 - 4021 SW11- 2540 ULP21 - 2521 ULP21- 2540
Industrial RO	SW8040HR-400 LP22 -8040

Catalogues of Residential RO Elements

Model	Rejection (%)	Ave Permeate (m3/day)	Testing Conditions		
			Pressure psi (MPa)	Concentration NaCl (ppm)	Recovery (%)
ULP1812 -50	97.5	50 (0.19)	60 (0.41)	250	15
ULP2012- 100	94	100 (0.38)	60 (0.41)	250	15
ULP3012 -300	97	300 (1.14)	100 (0.69)	500	15
ULP3013- 400	95	400 (1.52)	100 (0.69)	500	15

Catalogues of Commercial Membrane Products

Type	Model	Permeate Flow		Rejection Rate	Active Membrane Area		Testing Conditions (Water temperature at 25 C)			
		GPD	m^3/d	%	ft^2	m^2	Testing Pressure		Solution Concentration of NaCl	Recovery Rate
							psi	MPa	mg/L	%
Seawater Desalination Element	SW11 -4021	750	2.8	99.5	33	3.1	800	5.52	32000	4
	SW11- 2540	600	2.3	99.5	28	2.6				8
Ultra Low Pressure Element	ULP21 -2521	300	1.13	99	14	1.3	150	1.03	1500	8
	ULP21- 2540	750	2.84	99	30	2.8				15

Catalogues of Industrial RO Membrane Products

Type	Model	Permeate Flow		Rejection Rate	Active Membrane Area		Spacer Thickness	Testing Conditions (Water temperature at 25 C)			
		GPD	m^3/d	%	ft^2	m^2	mill	Testing Pressure		Solution Concentration of NaCl	Recovery Rate
								psi	MPa	mg/L	%
Seawater Desalination Element	SW8040HR -400	7500	28.4	99.8	400	37.2	28	800	5.52	32000	8
Brackish Water Element	8040-LP22	10500	39.7	99.5	400	37.2	28	225	1.55	2000	15

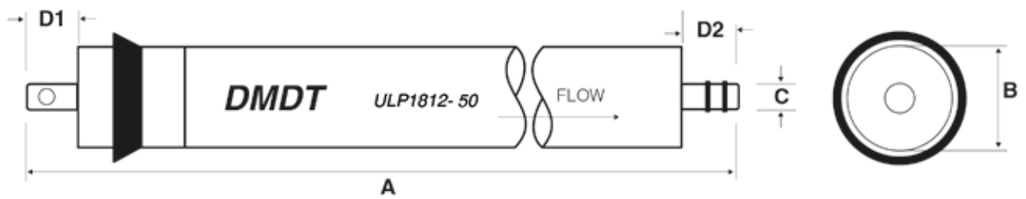
General Specification of Residential Membrane RO Elements

1) RO Element **ULP1812- 50**

Brief Introduction

Independently developed by DMDT, the RO element **ULP1812- 50** is designing for treatment of low-salinity water resources such as tap water, well water, etc. Working under extra low pressure, it is applicable to water purifying devices for residence, hospital and laboratory.

Dimensions: millimeter (inch)



A = 298.0mm (11.73 ') B = 46.0 mm (1.81 ')
C = 17.0mm (0.67 ') D1/D2 = 21.0mm (0.83 ')

Properties and Testing Conditions

Model	Ave Permeate (GPD)	Stable Rejection (%)	Min Rejection (%)
ULP1812- 50	**50**	**97.5**	**96**

Notes: Permeate of single element vary within -20% ~ +20%

Testing Conditions

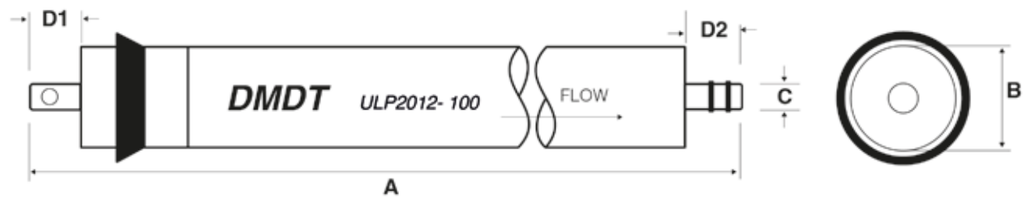
Testing Pressure	60 psi (0.41 MPa)
Temperature of Testing Solution	25 °C
Concentration of testing Solution	250 ppm
PH of testing solution	6.5 ~ 8.5
Recovery of single element	15%

2) RO Element **ULP2012- 100**

Brief Introduction

Independently developed by DMDT, the RO element **ULP2012- 100** is designing for treatment of low-salinity water resources such as tap water, well water, etc. Working under extra low pressure, it is applicable to water purifying devices for residence, hospital and laboratory.

Dimensions: millimeter (inch)



A = 298.0mm (11.73 ') B = 48.0 mm (1.89 ')
C = 17.0mm (0.67 ') D1/D2 = 21.0mm (0.83 ')

Properties and Testing Conditions

Model	Ave Permeate (GPD)	Stable Rejection (%)	Min Rejection (%)
ULP2012- 100	**100**	**94**	**93**

Notes: Permeate of single element vary within -20% ~ +20%

Testing Conditions

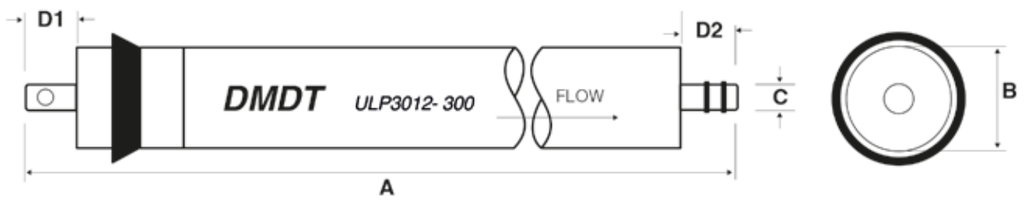
Testing Pressure	60 psi (0.41 MPa)
Temperature of Testing Solution	25 °C
Concentration of testing Solution	250 ppm
PH of testing solution	6.5 ~ 8.5
Recovery of single element	15%

3) RO Element **ULP3012- 300**

Brief Introduction

Independently developed by DMDT, the RO element **ULP3012- 300** works under extra low pressure and is applicable to automatic water dispenser and residential pure water machine, etc.

Dimensions: millimeter (inch)



A = 298.0mm (11.73 ') B = 73 mm (2.87 ')
C = 17.0mm (0.67 ') D1/D2 = 21.0mm (0.83 ')

Properties and Testing Conditions

Model	Ave Permeate (GPD)	Stable Rejection (%)	Min Rejection (%)
ULP3012 - 300	300	97	96

Notes: Permeate of single element vary within -20% ~ +20%

Testing Conditions

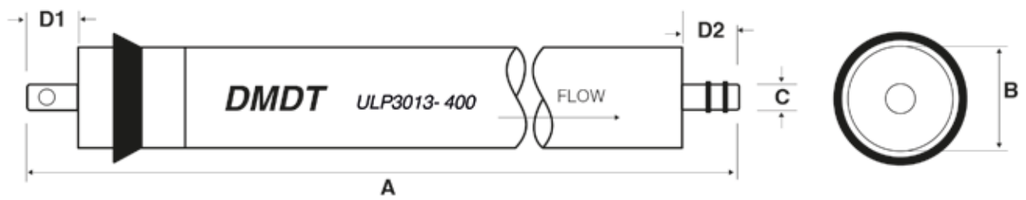
Testing Pressure	100 psi (0.69 MPa)
Temperature of Testing Solution	25 °C
Concentration of testing Solution	500 ppm
PH of testing solution	6.5 ~ 8.5
Recovery of single element	13% ~ 18%

4) RO Element **ULP3013- 400**

Brief Introduction

Independently developed by DMDT, the RO element **ULP3013- 400** works under extra low pressure and is applicable to automatic water dispenser and residential pure water machine, etc.

Dimensions: millimeter (inch)



A = 333.0mm (13.11 ') B = 67.8 mm (2.67 ')
C = 17.0mm (0.67 ') D1/D2 = 21.0mm (0.83 ')

Properties and Testing Conditions

Model	Ave Permeate (GPD)	Stable Rejection (%)	Min Rejection (%)
ULP3013- 400	400	95	94

Notes: Permeate of single element vary within -20% ~ +20%

Testing Conditions

Testing Pressure	100 psi (0.69 MPa)
Temperature of Testing Solution	25 °C
Concentration of testing Solution	500 ppm
PH of testing solution	6.5 ~ 8.5
Recovery of single element	15%

General Specification of Commercial Membrane RO Elements

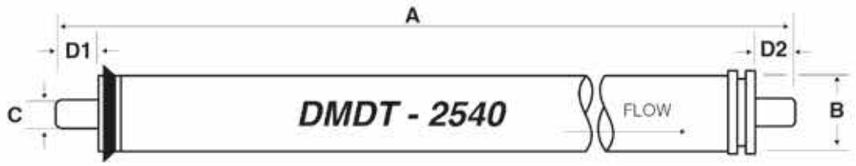
1) ULP Series of Ultra-low Pressure Membranes

ULP series of ultra-low pressure aromatic polyamide RO element is developed by DMDT for treatment of surface water and underground water. Its operation Pressure is about 2/3 of low pressure membrane, and the rejection rate can reach %99.5. Thus, it can reduce the investment cost of related pumps, pipelines, containers and other equipment and operation cost of RO system, improve economic benefits.

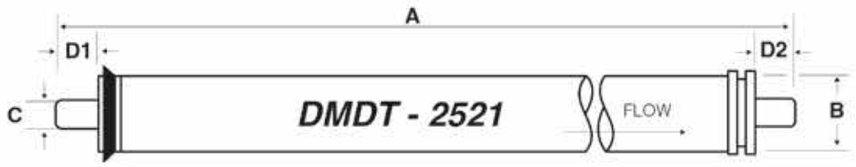
ULP series RO element normally suitable for treatment of surface water, underground water and municipal water with TDS is less than 2000 ppm. It is mainly applied in bottle water, drinking water, boiler replenishment water, food processing and pharmaceutical manufacturing industries and other fields.

Model	Active Membrane Area ft² (m²)	Permeate Flow GPD (m³/day)	Salt Rejection Rate %	Minimum Rejection Rate %
ULP21- 2540	30 (2.8)	750 (2.84)	99	98.5
ULP21- 2521	14 (1.3)	300 (1.13)	99	98.5
Testing Condition	Testing Pressure 150 psi (1.03 MPa)			
	Testing solution temperature at 25 °C			
	Tested at 1500 ppm NaCl solution			
	PH value of testing solution 7 ± 0.5			
	Recovery Rate of single element 15%			
Operation Limits & Conditions	Maximum working pressure	600 psi (4.14 MPa)		
	Maximum volume of feed water	16 gpm (3.6 m3/h)		
	Maximum feedwater temperature	45 °C		
	Maximum feedwater flow SDI15	5		
	Residual chlorine concentration of feed water	< 0.1 ppm		
	PH rang of feed water during continuous operation	3 ~ 10		
	PH rang of feed water during chemical cleaning	2 ~ 12		
	Maximum pressure drop per element	15 psi (0.1 MPa) for 2540 10 psi (0.07 MPa) for 2521		

Size of Membrane Element: 1.0 inch=25.4 mm



A/mm (inch)	B/mm (inch)	C/mm (inch)	D/mm (inch)
1016 (40)	61 (2.4)	19.1 (0.75)	30.2 (1.19)



A/mm (inch)	B/mm (inch)	C/mm (inch)	D/mm (inch)
553.4 (21)	61 (2.4)	19.1 (0.75)	30.2 (1.19)

Note: The permeate flow listed in the table is the average value. The permeate flow of single element is tolerance to ±20 of this value.

2) Commercial SW series of sea water desalination RO element

SW series of sea water aromatic polyamide RO element developed by DMDT for seawater desalination. This series of elements have the characteristics of low operation pressure, low equipment investment, good desalination performance and stability.

SW series membrane elements are generally suitable for the treatment of seawater and brackish water with high concentration. It can be used for seawater desalination, desalination of brackish water with high concentration, boiler replenishment water in power plants, wastewater reuse, concentration and recovery of high value-added substances such as food and pharmaceuticals, etc.

Model	Active Membrane Area ft² (m²)	Permeate Flow GPD (m³/day)	Salt Rejection Rate %	Minimum Rejection Rate %
SW11- 4021	33 (3.1)	750 (2.84)	99.5	99.3
SW11 -2540	28 (2.6)	600 (2.3)	99.5	99.3
Testing Condition	Testing Pressure 800 psi (5.52 MPa)			
	Testing solution temperature at 25 °C			
	Tested at 32000 ppm NaCl solution			
	PH value of testing solution 8			
	Recovery Rate of single element 4% for 4021 8% for 2540			
Operation Limits & Conditions	Maximum working pressure	1200 psi (8.28 MPa)		
	Maximum volume of feed water	16 gpm (3.6 m3/h) for 4021 6 gpm (1.4 m3/h) for 2540		
	Maximum feedwater temperature	45 °C		
	Maximum feedwater flow SDI_{15}	5		
	Residual chlorine concentration of feed water	< 0.1 ppm		
	PH rang of feed water during continuous operation	2 ~ 11		
	PH rang of feed water during chemical cleaning	1 ~ 13		
	Maximum pressure drop per element	15 psi (0.1 MPa)		

Size of Membrane Element: 1.0 inch=25.4 mm

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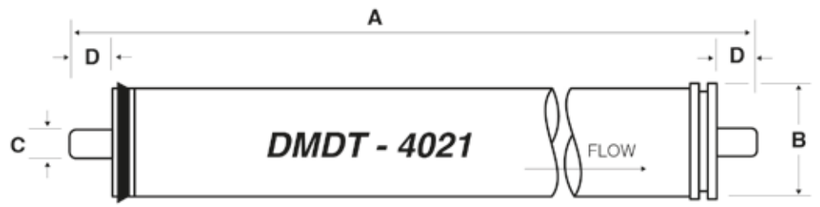
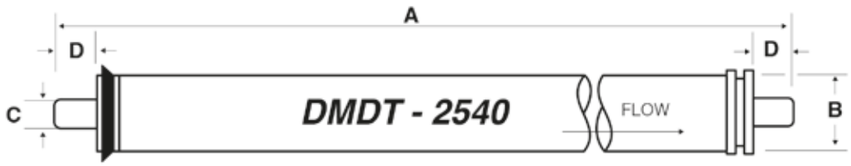


(A/mm (inch)	B/mm (inch)	C/mm (inch)	D/mm (inch)
553.4 (21)	99.7(3.9)	19.1 (0.75)	26.7(1.05)



(A/mm (inch)	B/mm (inch)	C/mm (inch)	D/mm (inch)
1016 (40)	61(2.4)	19.1 (0.75)	30.2(1.19)

Note: The permeate flow listed in the table is the average value. The permeate flow of single element is tolerance to ±20 of this value.

General Specification of Industrial RO Elements

1) Seawater Desalination Element: SW8040HR -400

Brief Introduction:

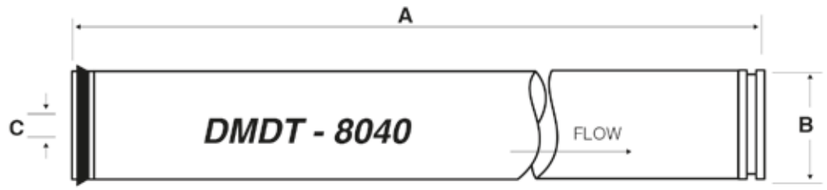
SW-8040-400 aromatic polyamide RO element is developed by DMDT for seawater desalination. This series of elements have the characteristics of low operating pressure, low equipment investment, good desalination performance and stability.

This membrane elements are generally suitable for the treatment of seawater and brackish water with high concentration. It can be used for seawater desalination, desalination of brackish water with high concentration, boiler replenishment water in power plants, wastewater reuse, concentration and recovery of high value-added substances such as food and pharmaceuticals, etc.

Model	Active Membrane Area ft² (m^2)	Permeate Flow GPD (m^3/day)	Salt Rejection Rate %	Feed Spacer Thickness mill
SW-8040- 400	400 (37.2)	7500 (28.4)	99.8	28

Testing Condition	Operating Pressure 800 psi (5.52 MPa)	
	Temperature at 25 °C	
	Tested at 32000 mg/L NaCl solution	
	PH 8	
	Recovery Rate at 8%	
Operation Limits & Conditions	Maximum operating pressure	1200 psi (8.28 MPa)
	Maximum feedwater flow	75 gpm (17 m^3/h)
	Maximum feedwater temperature	45 °C
	Maximum feedwater flow SDI_{15}	5
	Allowed pH range for feedwater in operation	2 ~ 11
	Allowed pH range for chemical cleaning	1 ~ 13
	Maximum concentration of free chlorine	< 0.1 ppm
	Maximum pressure drop per element	15 psi (0.1 MPa)

Size of Membrane Element: 1.0 inch=25.4 mm



A/mm (inch)	B/mm (inch)	C/mm (inch)
1016 (40)	201(7.9)	29(1.125)

Notice:

1. All data and information provided in this manual have been obtained from long-term experiment by DMDT. We confirm the effective and accuracy of the data. We assume no liability for any consequences of user's failure in abiding the conditions specified in this manual in use or maintenance of membrane products. It is strongly recommended that the user shall strictly abide the designed use and maintenance requirements and keep relevant records.
2. The permeate value listed in the table is the average value. The permeate flow of single membrane element is tolerance not exceeding ±20% of the nominal value.
3. All wet-type membrane elements have been strictly tested before leaving the factory, and have been treated with 1.0% sodium hydrogen sulfite (10% glycerin antifreeze required in winter) for storage purpose, then sealed with plastic bag in vacuum, and further packed in carton boxes.
4. The membrane used should remain wet after being used; In long term suspension, to prevent the breeding of microbes, soak the membrane elements with protective solution is highly recommended, the solution (prepared with RO filtered water) containing 1.0% sodium hydrogen sulfite (food grade).
5. Operate low pressure flushing for 15-25 minutes of first use, high pressure flushing for 60-90 minutes when first use (Permeate flow no less than 50% of designed flow). Discard all the permeate and concentrated water produced during the first one hour after system start-up.
6. During storage and operation period, it is strictly prohibited to add any chemicals that may be harmful to membrane elements. In case of any violation in adding chemicals, DMDT assumes no liabilities for any damages incurred.
7. Along with technical development and product renovation, all information will be subject to modification without prior notification. Please keep notice of our website for any updates of the product.

2) Brackish Water Element: LP22 -8040

Brief Introduction:

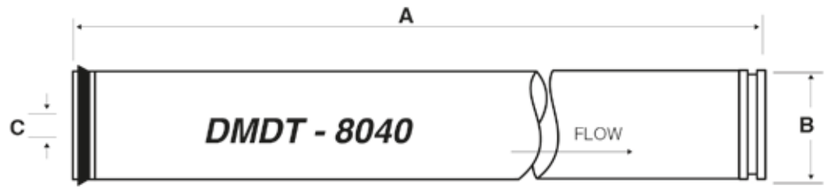
BW-8040 aromatic polyamide RO element is developed by DMDT for treatment of brackish water. It has the characteristics of low-pressure in operation, high permeate flow and excellent rejection performance in removing of solvable salts, TOC, SiO2, etc. It is especially suitable for the preparation of high purity water in electronics and power industry.

This membrane is normally suitable for treatment of brackish water, surface water, underground water and municipal water with TDS is less than 10000 ppm. It is mainly used for producing various scales of bottle water, drinking water, industrial used pure water, high purity water, boiler replenishment water, also for wastewater reuse, material concentration, purification and refining purposes.

Model	Active Membrane Area ft² (m^2)	Permeate Flow GPD (m^3/day)	Salt Rejection Rate %	Feed Spacer Thickness mill
LP22 -8040	400 (37.2)	10500 (39.7)	99.7	28

Testing Condition	Operating Pressure 225 psi (1.55 MPa)	
	Temperature at 25 °C	
	Tested at 2000 mg/L NaCl solution	
	PH 7 ± 0.5	
	Recovery Rate at 15%	
Operation Limits & Conditions	Maximum operating pressure	600 psi (4.14 MPa)
	Maximum feedwater flow	75 gpm (17 m^3/h)
	Maximum feedwater temperature	45 °C
	Maximum feedwater flow SDI_{15}	5
	Allowed pH range for feedwater in operation	2 ~ 11
	Allowed pH range for chemical cleaning	1 ~ 13
	Maximum concentration of free chlorine	< 0.1 ppm
	Maximum pressure drop per element	15 psi (0.1 MPa)

Size of Membrane Element: 1.0 inch=25.4 mm



A/mm (inch)	B/mm (inch)	C/mm (inch)
1016 (40)	201(7.9)	29(1.125)

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