

First Line



Engineered Composite Pressure Vessels



First Line is First Class

First Line

A NEW TYPE OF PRESSURE VESSEL COMPANY

First Line pressure vessels are engineered for use in Reverse Osmosis systems for a variety of industrial and commercial water treatment applications at pressures up to 2,000 PSI. Our pressure vessels are designed to accommodate any standard make 2.5", 4" and 8" with pressure range from 150-1200 psi, membrane filtration elements using First Line recommended adapter kits,* with multi-port up to 4" .

First Line pressure vessels are installed in over 32 countries worldwide.

Features

- In-house laboratory conducts fatigue tests
- Over 21 engineering design patents
- Computer controlled winding machine process
- Strategic thermocouple positioning
- Accurate temperature flow curing process
- UV Resistant polyurethane exterior paint finish

Designed for Multiple Applications


With over 50 years of combined experience in FRP pressure vessel engineering and design, we specialize in the manufacture of high quality pressure vessels.

Pressure vessels designed to provide long-term, trouble-free operation, with minimal down time and improve running costs.

- Designed for small to medium size plants
- Designed for large commercial size plants
- Installation and after-market services
- Custom-designed vessels with high chemical resistance

**Please consult with your First Line distributor for the adapter kit that's right for your application.*

Total Quality Control Process



MEETS THE STRICT REQUIREMENTS OF THE BOILER AND PRESSURE CODE OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS ASME



THE FIRST LINE PRODUCTION PLANT QUALITY SYSTEM STRICTLY COMPLIES WITH THE ISO 9001 INTERNATIONAL QUALITY STANDARDS



QUALITY, ENVIRONMENTAL, SAFETY, HEALTH & OTHER MANAGEMENT SYSTEM CERTIFICATION IN ACCORDANCE WITH INTERNATIONAL OR NATIONAL STANDARDS



COMPLIES WITH EUROPEAN PRESSURE EQUIPMENT DIRECTIVE P.E.D. 97/23/EC



First Line produces and manufactures high quality pressure vessel in full compliance with internationally accredited quality organizations. First Line products are manufactured with state of the art equipment, the highest quality materials and reliable parts that undergo rigorous quality control standards. Our proprietary designs allow for easy and fast maintenance for minimum downtime that ensure systems run efficiently and continuously.

At **First Line** we engineer high quality pressure vessel solutions that fit your need. First Line uses only high quality materials and reliable parts that undergo rigorous quality control standards. Our highly experienced, trusted and trained engineers have performed numerous service installations worldwide.

First Line



Computer controlled winding machines ensure stability, high precision while providing optimum placement and positioning.



The curing process takes place in highly specialized ovens. We are one of the few companies who use these advanced equipment for this process in China today.



First Line develops proprietary jigs and fixtures to ensure precise port accuracy and alignment.



First Line pressure vessels undergo a rigorous hydro test process using computer controlled equipment to eliminate leaks.



First Line uses Smart Packaging, tough and highly durable materials made to withstand the hazards and rigors of handling to ensure that pressure vessels arrive in pristine shape and condition.

Advanced Pressure Vessel Design

Redesigned End Plug



Incorporated o-ring offers better seal capabilities, minimized leakage and eliminates the need for the white thread seal tape employed in previous designs and makes it ideal for large scale plant designs.

Thrust Ring



Available for seawater and brackish water pressure vessel models and engineered to handle higher flow rates that are suitable for use with multi-port and larger size port pressure vessels.

Seawater FRP Shell



Advanced design eliminates the aluminum alloy collar, the new head is also constructed with FRP and is integrated with the FRP shell.

Dome-shaped 4 inch End Cap



The dome-shaped configuration offer superior pressure strength and water flow and distribution when compared to traditional flat end caps.

HCR Series [High Chemical Resistance]

Designed to replace traditional FRP / 316SST Pressure Vessels



The next generation FRP pressure vessels engineered for high chemical resistance to liquids such as: electroplate, landfill leachate, chlorine and concentrated liquid

Reference
 H_2SO_4 | up to 25% | HF: up to 10%
High Temp: 60° C-90° C

3-Piece Locking Kit Segment

A new locking kit segment with upgraded materials from aluminum alloy to stainless steel for superior corrosion avoidance properties.



The next generation FRP pressure vessels were designed to replace Super Duplex & Alloy pressure vessels.



First Line

We offer a full line of high quality pressure vessels ranging from 2.5" , 4" and 8" (16" high pressure vessels are available on special orders). Our product range covers all major industry system and application requirement with the maximum operating pressure up to 2,000 PSI. First Line also offer custom design that conform to required design specifications.

2.5"



2.5" End Port



2.5" End Port [Seawater]

4"



4" End Port



4" End Port [Seawater]



4" Side Port



4" Side Port [Seawater]

8"



8" End Port



8" End Port [Seawater]



8" Side Port



8" Side Port & Multi-port [Seawater]

First Line Pressure Vessel Models

Diameter	Pressure	1 Element	2 Elements	3 Elements	4 Elements	5 Elements	6 Elements	7 Elements	
8 in.	300Psi	F80-300S-1W	F80-300S-2W	F80-300S-3W	F80-300S-4W	F80-300S-5W	F80-300S-6W	F80-300S-7W	
		F80-300E-1W	F80-300E-2W	F80-300E-3W	F80-300E-4W	F80-300E-5W	F80-300E-6W	F80-300E-7W	
	450Psi	F80-450S-1W	F80-450S-2W	F80-450S-3W	F80-450S-4W	F80-450S-5W	F80-450S-6W	F80-450S-7W	
		F80-450E-1W	F80-450E-2W	F80-450E-3W	F80-450E-4W	F80-450E-5W	F80-450E-6W	F80-450E-7W	
	600Psi	F80-600S-1W	F80-600S-2W	F80-600S-3W	F80-600S-4W	F80-600S-5W	F80-600S-6W	F80-600S-7W	
		F80-600E-1W	F80-600E-2W	F80-600E-3W	F80-600E-4W	F80-600E-5W	F80-600E-6W	F80-600E-7W	
	1000Psi	F80-1000S-1W	F80-1000S-2W	F80-1000S-3W	F80-1000S-4W	F80-1000S-5W	F80-1000S-6W	F80-1000S-7W	
		F80-1000E-1W	F80-1000E-2W	F80-1000E-3W	F80-1000E-4W	F80-1000E-5W	F80-1000E-6W	F80-1000E-7W	
	1200Psi	F80-1200S-1W	F80-1200S-2W	F80-1200S-3W	F80-1200S-4W	F80-1200S-5W	F80-1200S-6W	F80-1200S-7W	
		F80-1200E-1W	F80-1200E-2W	F80-1200E-3W	F80-1200E-4W	F80-1200E-5W	F80-1200E-6W	F80-1200E-7W	
	4 in.	300Psi	F40-300E-1W	F40-300E-2W	F40-300E-3W	F40-300E-4W	F40-300E-5W	F40-300E-6W	F4021-300E-1W
			F40-300S-1W	F40-300S-2W	F40-300S-3W	F40-300S-4W	F40-300S-5W	F40-300S-6W	F4021-300S-1W
450Psi		F40-450E-1W	F40-450E-2W	F40-450E-3W	F40-450E-4W	F40-450E-5W	F40-450E-6W	F4021-450E-1W	
		F40-450S-1W	F40-450S-2W	F40-450S-3W	F40-450S-4W	F40-450S-5W	F40-450S-6W	F4021-450S-1W	
600Psi		F40-600E-1W	F40-600E-2W	F40-600E-3W	F40-600E-4W	F40-600E-5W	F40-600E-6W	F4021-600E-1W	
		F40-600S-1W	F40-600S-2W	F40-600S-3W	F40-600S-4W	F40-600S-5W	F40-600S-6W	F4021-600S-1W	
1000Psi		F40-1000E-1W	F40-1000E-2W	F40-1000E-3W	F40-1000E-4W	F40-1000E-5W	F40-1000E-6W	F4021-1000E-1W	
		F40-1000S-1W	F40-1000S-2W	F40-1000S-3W	F40-1000S-4W	F40-1000S-5W	F40-1000S-6W	F4021-1000S-1W	
1200Psi		F40-1200E-1W	F40-1200E-2W	F40-1200E-3W	F40-1200E-4W	F40-1200E-5W	F40-1200E-6W	F4021-1200E-1W	
		F40-1200S-1W	F40-1200S-2W	F40-1200S-3W	F40-1200S-4W	F40-1200S-5W	F40-1200S-6W	F4021-1200S-1W	
2.5 in.		300Psi	F2540-300E-1W	F2521-300E-1W	F2514-300E-1W				
		1000Psi	F2540-1000E-1W	F2521-1000E-1W	F2514-1000E-1W				
	1200Psi	F2540-1200E-1W	F2521-1200E-1W	F2514-1200E-1W					

Note: All part numbers, pressure ratings and related specifications are accurate as of this printing, for the latest information please contact your authorized First Line sales agent.

Multi-port option is available in port sizes up to 4"

Legend: E: End port, S: Side port

A Commitment to Innovation & Excellence

OLC Series (Online Cleaning)



Online Cleaning membrane pressure vessels with Quick Release locking mechanisms. Pressure vessels designed to quickly open & close to conveniently clean and service membrane filters with minimum downtime.

Sanitary Pressure Vessels



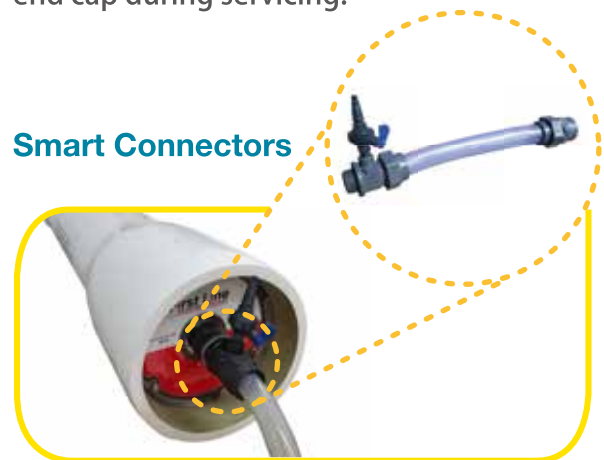
First Line's unique and innovative design complies with pharmaceutical/hygienic requirements. A viable alternative to higher priced stainless steel pressure vessels.



Secure End Cap Handles

Specially designed for easy handling of the end cap during servicing.

Smart Connectors



Hard connections require precision and accuracy during handling. *Smart Connectors* offer connections with ease and flexibility without the need for high accuracy. It also enables fast and convenient sample collection.



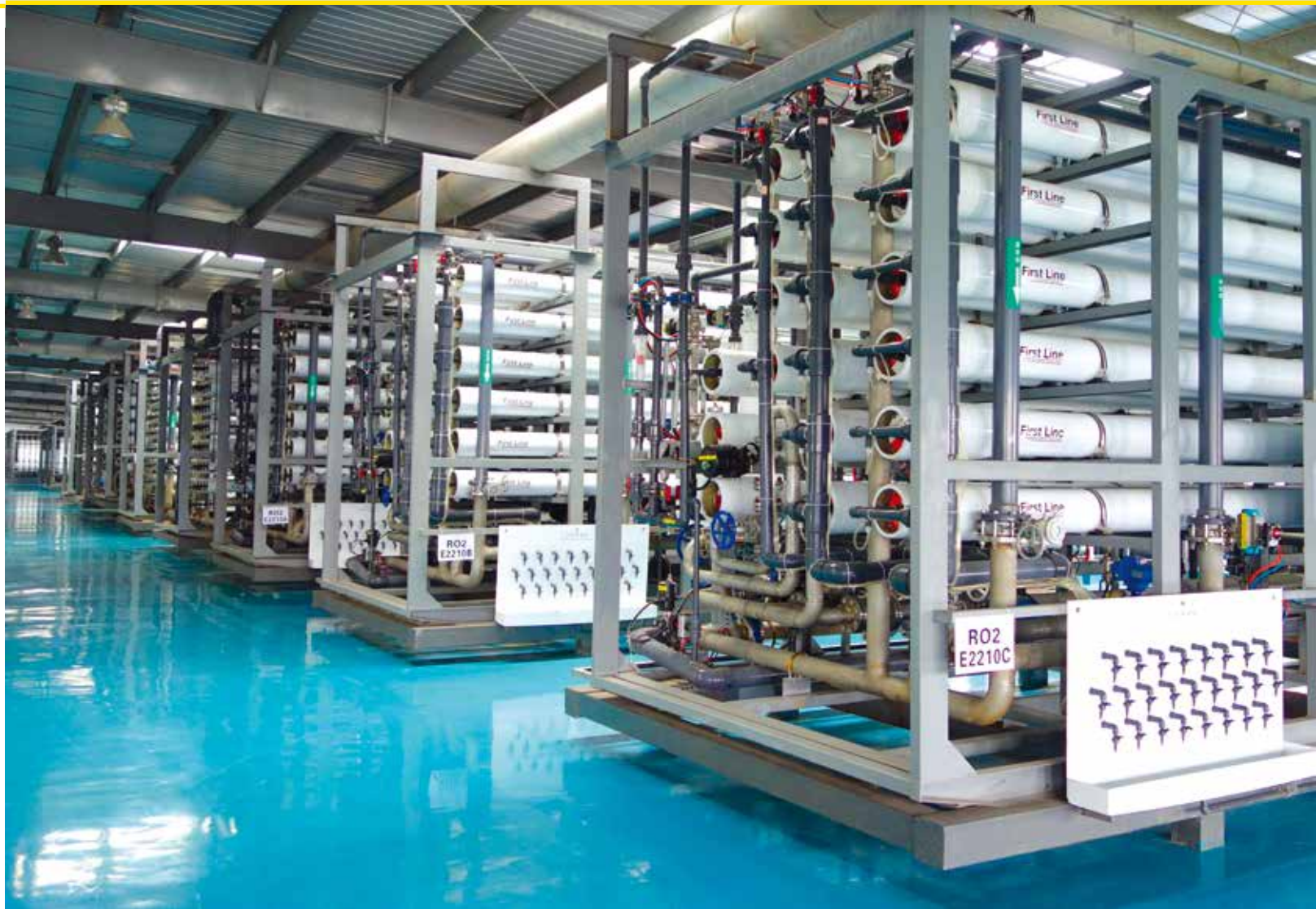
16" Pressure Vessel
AVAILABLE NOW!



1800/2000 PSI High Pressure Vessels

- High strength glass fiber
- High toughness resin system
- Grooved / Thread / Flange connection designs

Reference Installation



PROJECT NAME

Prince Paper Co., Ltd., Nantong, China

ENGINEERING COMPANY

Creation Environment, China

CAPACITY

First Stage 17,500 m³/Day
[Total Capacity 35,000 m³/Day]

INSTALLED UNITS

281 pcs.

MODEL

8 inch | 300 psi | 450 psi | 600 psi
6 element multi-port up to 2.5"

START UP DATE

October 2014

Benefit from our experience.

A Global Commitment

- ▶ **Continous Research & Development**
- ▶ **Sustainable Solutions**
- ▶ **Innovative Global Water Applications**



Benefit from our experience.



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