The ROPV technical team is composed of highly knowledgeable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:
- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin, Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

**OVERVIEW**
The ROPV R25E series model accommodates standard make 2.5” membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (−10–66°C), at operating pressures of up to 1,000 PSI / 69 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance.

**APPLICATION**
Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They’re fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

**FEATURES**
- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available in the following pressure ratings: 300 Psi, 600 Psi, 1000 Psi
<table>
<thead>
<tr>
<th>Model</th>
<th>Design / Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R2540B300E</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>40&quot; X 1</td>
</tr>
<tr>
<td>R2521B300E</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>21&quot; X 1</td>
</tr>
<tr>
<td>R2514B300E</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>14&quot; X 1</td>
</tr>
<tr>
<td>R2540B600E</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>40&quot; X 1</td>
</tr>
<tr>
<td>R2521B600E</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>21&quot; X 1</td>
</tr>
<tr>
<td>R2514B600E</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>14&quot; X 1</td>
</tr>
<tr>
<td>R2540B1000E</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>40&quot; X 1</td>
</tr>
<tr>
<td>R2521B1000E</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>21&quot; X 1</td>
</tr>
<tr>
<td>R2514B1000E</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>14&quot; X 1</td>
</tr>
</tbody>
</table>
The ROPV technical team is composed of highly knowledgeable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:
- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin, Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

**OVERVIEW**

The ROPV R40E series model accommodates standard make 4” membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI / 83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance.

**APPLICATION**

Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They’re fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

**FEATURES**

- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available in the following pressure ratings: 300 Psi, 450 Psi, 600 Psi, 1000 Psi, 1200 Psi
## Product Datasheet

**Model R40E**  
4" Standard Pressure Vessel

<table>
<thead>
<tr>
<th>Model</th>
<th>Design/Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R4040B300E</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B450E</td>
<td>450 Psi / 31 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>2700 Psi / 186 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B600E</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B1000E</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B1200E</td>
<td>1200 Psi / 83 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>7200 Psi / 498 Bar</td>
<td>40” X (1-6)</td>
</tr>
</tbody>
</table>

**Headquarters**  
Room 2501, Pufu Plaza No. 209  
Changjiang Road, Nangang District  
Harbin, P.R. China  
TEL: +86 451 8226 7301  
FAX: +86 451 8226 7303  
POSTCODE: 150090  
EMAIL: ropv@ropv.com.cn

**USA**  
Brentwood, CA 94513  
USA  
TEL: +1 925-237-0184  
EMAIL: lhwang@ropv.com.cn

ACS, ASME International, CE, CNAS, ISO, OHSAS, UL, WRAS are registered trademarks.

©2013 ROPV reserves the right to modify the design and specification contained herein without prior notice. Please contact your local ROPV sales representative for the most current information.

Doc. No. ROPV-CS-2013-01-001B-EN  
Printed in P.R. China
The ROPV technical team is composed of highly knowledgable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:

- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

OVERVIEW

The ROPV R40S series model accommodates standard make 4” membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI / 83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance.

APPLICATION

Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They’re fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

FEATURES

- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available in the following pressure ratings:
  300 Psi, 450 Psi, 600 Psi, 1000 Psi, 1200 Psi
<table>
<thead>
<tr>
<th>Model</th>
<th>Design/Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R4040B300S</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B450S</td>
<td>450 Psi / 31 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>2700 Psi / 186 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B600S</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B1000S</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>40” X (1-6)</td>
</tr>
<tr>
<td>R4040B1200S</td>
<td>1200 Psi / 83 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>7200 Psi / 498 Bar</td>
<td>40” X (1-6)</td>
</tr>
</tbody>
</table>
The ROPV technical team is composed of highly knowledgable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:
- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

**OVERVIEW**
The ROPV R80E series model accommodates standard make 8" membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI / 83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance.

**APPLICATION**
Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They’re fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

**FEATURES**
- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available Pressure Ratings:
  300 Psi, 450 Psi, 600 Psi, 1000 Psi, 1200 Psi
# Product Datasheet

## R80E Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Design / Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8040B300E</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>40' X (1-8)</td>
</tr>
<tr>
<td>R8040B450E</td>
<td>450 Psi / 31 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>2700 Psi / 186 Bar</td>
<td>40' X (1-8)</td>
</tr>
<tr>
<td>R8040B600E</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>40' X (1-8)</td>
</tr>
<tr>
<td>R8040B1000E</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>40' X (1-8)</td>
</tr>
<tr>
<td>R8040B1200E</td>
<td>1200 Psi / 83 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>7200 Psi / 498 Bar</td>
<td>40' X (1-8)</td>
</tr>
</tbody>
</table>
The ROPV technical team is composed of highly knowledgable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:

- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

OVERVIEW
The ROPV R80S series model accommodates standard make 8" membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI / 83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance. The R80S series model is certified and meets the standards of the ASME [American Society of Mechanical Engineers], Section X, RP.

APPLICATION
Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They're fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

FEATURES
- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available Pressure Ratings: 300 Psi, 450 Psi, 600 Psi, 1000 Psi, 1200 Psi
<table>
<thead>
<tr>
<th>Model</th>
<th>Design/ Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8040B300S</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R8040B450S</td>
<td>450 Psi / 31 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>2700 Psi / 186 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R8040B600S</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R8040B1000S</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R8040B1200S</td>
<td>1200 Psi / 83 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>7200 Psi / 498 Bar</td>
<td>40” X (1-8)</td>
</tr>
</tbody>
</table>
The ROPV technical team is composed of highly knowledgable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:

- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

OVERVIEW

The ROPV R80U series models accommodates any standard make of 8” UF membrane elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14-150°F (-10–66°C). Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance.

APPLICATION

Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They're fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

FEATURES

- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available pressure rating: 150 Psi
<table>
<thead>
<tr>
<th>Model</th>
<th>Design/Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R8060U150S</td>
<td>150 Psi / 10 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>900 Psi / 60 Bar</td>
<td>60” X (1-4)</td>
</tr>
</tbody>
</table>

Please refer to the latest ROPV sales drawings for multi-port options.
About ROPV

The ROPV technical team is composed of highly knowledgable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:

- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

OVERVIEW

The ROPV R160E series models accommodates any standard make of 16” membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI / 83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance.

APPLICATION

Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They're fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

FEATURES

- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available Pressure Ratings:
  300 Psi, 450Psi, 600Psi, 1000Psi, 1200Psi
## R160E Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Design/Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R16040B300E</td>
<td>300 Psi / 21 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>1800 Psi / 126 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B450E</td>
<td>450 Psi / 31 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>2700 Psi / 186 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B600E</td>
<td>600 Psi / 41 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>3600 Psi / 246 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B1000E</td>
<td>1000 Psi / 69 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>6000 Psi / 414 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B1200E</td>
<td>1200 Psi / 83 Bar</td>
<td>150°F / 66°C</td>
<td>20°F / -7°C</td>
<td>7200 Psi / 498 Bar</td>
<td>40” X (1-8)</td>
</tr>
</tbody>
</table>
The ROPV technical team is composed of highly knowledgeable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:
- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

OVERVIEW
The ROPV R160S series models accommodates any standard make of 16" membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI / 83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance. The R160S series model is certified and meets the standards of the ASME [American Society of Mechanical Engineers], Section X, RP.

APPLICATION
Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They’re fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

FEATURES
- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available Pressure Ratings: 300 Psi, 450 Psi, 600 Psi, 1000 Psi, 1200 Psi
### R160S Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Design/Operating Pressure</th>
<th>Max. Operating Temperature</th>
<th>Min. Operating Temperature</th>
<th>Qualification Pressure</th>
<th>Element Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>R16040B300S</td>
<td>300 Psi/21Bar</td>
<td>150°F /66°C</td>
<td>20°F/-7°C</td>
<td>1800 Psi/126 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B450S</td>
<td>450 Psi/31Bar</td>
<td>150°F /66°C</td>
<td>20°F/-7°C</td>
<td>2700 Psi/186 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B600S</td>
<td>600 Psi/41Bar</td>
<td>150°F /66°C</td>
<td>20°F/-7°C</td>
<td>3600 Psi/246 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B1000S</td>
<td>1000 Psi/69Bar</td>
<td>150°F /66°C</td>
<td>20°F/-7°C</td>
<td>6000 Psi/414 Bar</td>
<td>40” X (1-8)</td>
</tr>
<tr>
<td>R16040B1200S</td>
<td>1200 Psi/83Bar</td>
<td>150°F /66°C</td>
<td>20°F/-7°C</td>
<td>7200 Psi/498 Bar</td>
<td>40” X (1-8)</td>
</tr>
</tbody>
</table>
The ROPV technical team is composed of highly knowledgable and capable team from the FRP Institute specializing in advanced polymer materials, with over 150 combined years of technical and industry experience in composite design and manufacturing.

The ROPV laboratory is an integrated physical and chemical laboratory equipped with advanced equipment to perform testing and analysis in the areas of:

- Finite Element Analysis
- Resin System Research
- Fatigue Test of Complex Material Compositions

Today ROPV is the largest pressure vessel manufacturer in China with headquarters in Harbin Heilongjiang Province, China; manufacturing facility in Dezhou, Shandong Province and global sales office in San Francisco, California, USA.

**OVERVIEW**

The ROPV R180S series models accommodates any standard make of 18” membrane filtration elements. Manufactured to very exacting specifications with only the highest quality materials for continuous use. Our pressure vessels operate within a temperature range of 14–150°F (-10–66°C), at operating pressures of up to 1,200 PSI/83 Bar. Individual units are hydro-tested prior to shipment to ensure only the highest quality and stable performance. The R180S series model is certified and meets the standards of the ASME [American Society of Mechanical Engineers], Section X, RP.

**APPLICATION**

Our pressure vessels were developed for permeate and feed/concentrate with variable port options, connection types and sizes. They’re fully customizable and are offered as OEM equipment for UF, EDI, Large Diameter Membranes and Emerging Water Treatment Technologies.

**FEATURES**

- Easy installation and maintenance
- Constructed for best chemical compatibility and corrosion resistance
- Fully customizable and configured based on customer requirements
- Available Pressure Ratings:
  - 300 Psi, 450 Psi, 600 Psi, 1000 Psi, 1200 Psi
## Product Datasheet

### R180S Series

| Model        | Design/Operating Pressure | Max. Operating Temperature | Min. Operating Temperature | Qualification Pressure | Element Length |
|--------------|----------------------------|----------------------------|----------------------------|------------------------|----------------|----------------|
| R18060B300S | 300 Psi / 21 Bar           | 150°F / 66°C               | 20°F/-7°C                  | 1800 Psi / 126 Bar     | 60” X (1-5)   |
| R18060B450S | 450 Psi / 31 Bar           | 150°F / 66°C               | 20°F/-7°C                  | 2700 Psi / 186 Bar     | 60” X (1-5)   |
| R18060B600S | 600 Psi / 41 Bar           | 150°F / 66°C               | 20°F/-7°C                  | 3600 Psi / 246 Bar     | 60” X (1-5)   |
| R18060B1000S| 1000 Psi / 69 Bar          | 150°F / 66°C               | 20°F/-7°C                  | 6000 Psi / 414 Bar     | 60” X (1-5)   |
| R18060B1200S| 1200 Psi / 83 Bar          | 150°F / 66°C               | 20°F/-7°C                  | 7200 Psi / 498 Bar     | 60” X (1-5)   |
MVI (Multi Vessel Integration) is a multiple vessel combination unit. This is a revolutionary technology created by ROPV.

The MVI is going to revolutionize the industry by reducing the cost of installation. During the installation of large-scale projects, there are a lot of nodes in the large-scale 8 inches vessels system and each node needs corresponding mounting material, such as clamps, short tubes and connect seal parts. This results in problems like more material cost, more installing cost, more leakage risk, more foot print size, more repair problem, etc. The MVI unique design eliminates grooved end couplings between vessels, reduces foot print size and saves time during assembly. MVI is the perfect product for all sizes projects.

1. Projects are easy to install.
2. Saving a large number of clamps, lowering the cost of projects.
4. Saving foot print size.
5. All the seals are visible. After remove the end plate, the side ports, the tension adjustment device and connect seal ring can be changed. By unscrewing the preloaded bolt can simply remove the connect parts between vessels to repair and change.
MVI advantages compared with traditional vessels. (based on a 340t/h system)

1. Saving footprint size by 8.5%.
2. Saving number of clamps by 75%, lowering the cost of projects by 75%.

3. Taking port diameter of 2.5" as example, to drill such port in the vessel and increase the flow by 1.5 times, it is equal to the traditional port diameter of 3".

Similarly, MVI advantages compared with 16 inch vessels. (based on a 340t/h system)

1. Saving footprint size by 12%.
2. Saving number of clamps by 50%, lowering the cost of projects by 70%.
3. The cost of membrane shell and membrane element reduces about 30%.
4. Easy installation and maintenance, mature technology.

ROPV is committed to providing high quality product and service for water treatment industry.
Bundamba Advanced Water Treatment Project

BACKGROUND AND CHALLENGES

Due to severe water shortages in Australia water restrictions are fairly common in many regions and cities. The range is from a level 1 to the most extreme level 8, and is also referred to as stages; from 1 to 8, each one more restrictive than the next as you go up. “Water inspectors,” are there to implement the rules and issue penalties to people who waste water. South East Queensland’s (SEQ) normal weather condition is extremely dry, but when the pendulum swings it turns into totally drought conditions. As of this writing the area is at level 6.

In response to these harsh conditions the South East Queensland Water Strategy (The Strategy) has been put in place. It is an adaptive plan whose goal is to meet SEQ’s water supply requirements to 2050 and beyond. The Strategy’s executive summary states that; “The Strategy will deliver a Water Supply Guarantee, supplying sufficient water to support a comfortable, sustainable and prosperous lifestyle while meeting the needs of urban, industrial and rural growth and the environment.”

The Bundamba AWTP Located near Ipswich, Queensland, was built to provide an alternative water supply for the region and diminish the pressure on SEQ’s existing dams and waterways. It is part of a $2.5bn (AUS) Western Corridor Recycled Water Project. The largest undertaking of its kind in the Southern Hemisphere and is ranked as the world’s third-biggest recycled water scheme to date. It will provide 110 MGD (400 MLD) of recycled water to reduce the load on the region’s water supply.
ROPV manufactures value and performance engineered pressure vessels in a wide range of sizes for all major industry systems and application requirements with an installed base in excess of 160,000 units used in award winning plants worldwide.

Our commitment to quality and innovation has led to successful development of original equipment configurations with various industry partners for UF, EDI, large diameter membranes (up to 25"), and emerging water treatment technologies. We adhere to strict industry regulations to ensure safe manufacturing processes, enhanced technical competency and implementation of total quality management.

ROPV's global sales offices and US engineering group is located in the San Francisco Bay Area, California, with headquarters in Harbin, China, and manufacturing plant located in Dezhou, Shandong Province. Today, we are the largest, the oldest and most experienced manufacturer in the Asia/Pacific region.

Visit us at ropv.com.cn

This ambitious project is delivered by an alliance between Black & Veatch/Thiess joint venture in partnership with Western Corridor Recycled Water Pty., Ltd. and the Queensland Government's Department of Planning and Infrastructure and features a network of 200 km of underground pipelines and three new advanced water treatment plants that include: Bundamba, Luggage Island and Gibson Island.

TECHNOLOGY

The cutting edge plant provides purified recycled water and is quite unique because it employs combined technologies in micro-filtration membranes, reverse osmosis membranes and advanced oxidation using UV irradiation and peroxide. The Bundamba AWTS employs 18-inch diameter MegaMagnum® reverse osmosis (RO) elements from Koch Membrane Systems (KMS) to reclaim municipal effluent for use as the water supply for cooling towers at the Swanbank and the Torong power stations.

In making the decision to use the world's largest commercially available pressure vessel for their spiral wound RO elements, KMS turned to ROPV of Harbin, China. ROPV was born out of the experts from China's highly reputed and well respected Harbin FRP Design Institute. ROPV developed the R180S pressure vessel to house KMS's 18" x 60" MegaMagnum spiral elements with a surface area of 2,800 ft² of membrane surface area versus 400 ft² for the commonly used 8" x 40" standard pressure vessels. These pressure vessels were specifically designed to significantly reduce the cost, footprint and installation time of the RO systems.
Caofedian: Rising from North China

BACKGROUND AND CHALLENGES

As China’s industrialization continues to gather steam fueled by rapid economic growth, water consumption grows at an exponential rate. Water supply shortages are acute in urban areas where demand is drastically increasing due to population growth, while other parts of the country are affected by drought. The demand for desalination and reclamation of sewage and wastewater, using water treatment membranes has been steadily growing in China and the RO membrane market continues to expand at a rate exceeding 20% a year.

The Caofedian Seawater Desalination (CSD) plant is part of the Caofedian industrial zone (CIZ). It is a 2005-listed pilot area for the development of a Recyclable / Circular Economy. A circular economy refers to an industrial economy that is; by design or intent, restorative and in which materials flows are of two types, biological nutrients, designed to reenter the biosphere safely, and technical nutrients, which are designed to circulate at high quality without entering the biosphere. This site has been designated as a model for the country’s environment industrial base and is set to recycle 99.5 percent of its solid waste and 99.7 percent of all wastewater.

The area is 200 km from Beijing, and is located at an important site of Bohai Rim. Caofedian is strategically located as a passageway for North China to Northeast Asia and the Asia-Europe continental bridge which links inland China and Middle Asia, West Asia and Europe.

Caofedian, once a small sand spit in the Bohai Bay is a reclaimed land area and has extended into a land of more than 60 square km through sea fillings since 2003. The frame of a modern city is beginning to take shape as crowds of elite technicians and industrial workers swarm to the zone.

ropv.com.cn
TECHNOLOGY

One of the basic problems of seawater desalination is the by-product: concentrated seawater. Seawater desalination plants and factories ultimately discharge it back into the ocean because they have no use for it. This causes both favorable and unfavorable consequences. Although the resultant chemicals cause environmental pollution, they also contain NaCl and bromine; important raw materials in the salt chemical industry; and discharging them are considered a waste.

CIZ collaborated with chemical company Tangshan Sanyou Group to construct a combined seawater desalination and chemical plant in the Caofeidian industrial zone, where the by-products of the desalination process will be used for the chemical industry. The combined projects were designed to convert concentrated seawater into raw materials for soda production. Upon the plant’s completion, it will process 18 million m³ of concentrated seawater, extracting over 600,000 tons/year of sodium chloride. The goal of this novel approach is to offer environmental protection while taking advantage of economic advantages it offers.

The CSD plant was nominated for The 2011 Global Water Awards: Desalination Deal of the Year. It is the first 50,000 m³/day desalination plant in the most ambitious desalination project in Asia, that will usher in further plans to extend the plant up to a total capacity of 900,000 m³/day. Aqualyng and the Development Center of Water Treatment Technology, Hangzhou selected ROPV pressure vessels for the membrane housing. ROPV pressure vessels were born out of the development efforts from the experts of the Harbin FRP Institute. Established in 1984, the institute’s designers and researchers worked on advanced polymer materials.

Mr. Li Youqing, ROPV CEO said, “ROPV’s total quality management assures the CSD that they are receiving world class performance engineered pressure vessels.”

ROPV supplied the Caofeidian Seawater Desalination plant with R808 8” x 40” high pressure seawater pressure vessels which were developed as part of 5 trains with 132 units each for a total of 660 units that produces a capacity of 50,000 m³/day [13 mgd].

The quality of water to be produced at the plant will fully meet the national drinking water standards. The water will be mainly used as industrial water at the Caofeidian industrial development zone and part of the production to be used as drinking water.
**Project Snapshot**

**SCNP, Singapore**

**Phase I**
- **Capacity**: 228,000 m³/day [60 mgd]
- **Installed Units**: 10 trains of RO80 8" Series Pressure vessels
- **198 units per train [total 1,980]
- **Start-up Date**: May 2009

**WINNER – Global Water Intelligence Award**
The Sembcorp Changi NEWater Plant (SCNP) is the winner of the 2010 Global Water Intelligence Award for Water Reuse Project of the year.

**ROPV supplied Reverse Osmosis Skid-Pressure Vessel and Frame for Changi NEWater Plant Phase II**, also including all piping, fitting, all ancillary components and accessories within this skid.

**Phase II**
- **Capacity**: 228,000 m³/day [60 mgd]
- **Installed Units**: 10 trains of RO80 8" Series Pressure vessels
- **224 units per train [total 2,240]
- **Start-up Date**: 2016

---

**Sembcorp Changi NEWater Plant [SCNP]**

**BACKGROUND AND CHALLENGES**

Singapore is a water stressed country faced with a combination of challenges – possessing a small amount of land and territory, while having a large urban population. And without natural freshwater lakes, the primary domestic source of water is rainfall, collected in reservoirs or storm water collection ponds. In 1965 the PUB was formed to oversee Singapore’s water needs, which historically has relied on Malaysia for up to 50% of its daily fresh water consumption. However the water supply provisions from Malaysia has always been regulated by agreements greatly underpinned by uncertainties due to political tensions between the two countries. This long-standing dispute has been ongoing for several decades now, ever since Singapore’s independence from Malaysia in 1965. It was only as recent as 2009 that Singapore has managed to reduce its water import reliance from Malaysia down to 40% of total consumption. Due to this continuing tension between the two countries, Singapore is left vulnerable to the risk of cut-off, whether announced or not, of water supply from Malaysia. And with Singapore’s water demand increasing at a rate of about 4% over the past decade due to the increase in population and economic development, the Singapore government has proactively engaged in the development of several water related projects to guarantee their self-reliance and sustainability.

**TECHNOLOGY**

Singapore’s latest water project is a very innovative “plant-on-plant” design conceptualized by the PUB that reduces land use and minimizes construction cost. The Sembcorp Changi NEWater Plant (SCNP) is comprised of two sections. The main process facilities of the SCNP were built on the rooftop of the Changi Water Reclamation Plant while the storage tanks were built on land. The PUB...
ROPV manufactures value and performance engineered pressure vessels in a wide range of sizes for all major industry systems and application requirements with an installed base in excess of 160,000 units used in award-winning plants worldwide.

Our commitment to quality and innovation has led to successful development of original equipment configurations with various industry partners for UF, EDI, large diameter membranes (up to 25"), and emerging water treatment technologies. We adhere to strict industry regulations to ensure safe manufacturing processes, enhanced technical competency and implementation of total quality management.

ROPV’s global sales offices and US engineering group is located in the San Francisco Bay Area, California, with headquarters in Harbin, China, and manufacturing plant located in Dezhou, Shandong Province. Today, we are the largest, oldest and most experienced manufacturer in the Asia-Pacific region.

Visit us at ropv.com.cn

Headquarters

USA

awarded the contract to Sembcorp, a leading utilities and marine group, based on a Design-Build-Operate agreement to supply NEWater to Singapore over a 25-year period (2010-2035). Black & Veatch, a leading global engineering company provided full design engineering services for the plant along with construction support and commissioning services. While the joint venture between Biwater AEWT and Biwater Malaysia was sub-contracted to supply the Reverse Osmosis treatment plant. The plant consists of ten RO trains with three stages at a total of 85% recovery.

Although budgetary costs were an important consideration, quality was never an issue. Every supplier needed to meet the plant’s most stringent quality requirements. When Biwater made a decision on the choice of pressure vessel manufacturer, they turned to the largest FRP pressure vessel in the Asia Pacific region – ROPV of Harbin, China. The combination of ROPV’s highly competitive operational cost, bulk buying power of raw material resources and unmatched manufacturing experience in the region made the decision easy. Mr. Li Youqing, ROPV CEO said, “ROPV was born out of the experts from the Chinese government’s highly reputed and respected Harbin FRP Design Institute. Established in 1984, the institute’s designers and researchers worked on advanced polymer materials. With this knowledge, Biwater is assured that they receive performance engineered pressure vessels from the engineering craftsmen of ROPV.”

ROPV supplied Biwater with close to 2,000 units of R80S 8” x 40” high pressure seawater pressure vessels which were developed as part of 10 trains with 198 units each for a total of 1,980 units that produces a capacity of 228,000 m³ per day [60 mgd] - this is equivalent to 60 million one-gallon bottles and will supply 15% of Singapore’s water needs.

Together, the five NEWater projects meet 30% of Singapore’s water needs. And in a further move towards self-reliance the PUB plan to expand the NEWater network of pipelines by up to 87 km (54 miles), a project worth over $8400 million. When completed, the pipeline will extend from Changi NEWater Plant to Jurong, Tuas, Jurong Island and Sentosa. It will also be linked to existing NEWater pipelines in the Bedok, Seletar, Kranji and Ulu Pandan clusters.

The quality of NEWater consistently exceeds the requirements set by United States EPA and WHO guidelines and is, in fact, cleaner than all current sources of Singapore’s water.
Tuaspring Seawater Desalination Plant [TSDP]

Aerial view rendering of the Tuaspring Seawater Desalination Plant courtesy of Hyflux.

BACKGROUND AND CHALLENGES

Singapore is a water stressed country faced with a combination of challenges - possessing a small amount of land and territory, while having a large urban population. And without natural freshwater lakes, the primary domestic source of water is rainfall, collected in reservoirs or storm water collection ponds. In 1965 the PUB was formed to oversee Singapore’s water needs, which historically has relied on Malaysia for up to 50% of its daily fresh water consumption. However the water supply provisions from Malaysia has always been regulated by agreements greatly underpinned by uncertainties due to political tensions between the two countries. This long-standing dispute has been ongoing for several decades now, ever since Singapore’s independence from Malaysia in 1965. It was only as recent as 2009 that Singapore has managed to reduce its water import reliance from Malaysia down to 40% of total consumption. Due to this continuing tension between the two countries, Singapore is left vulnerable to the risk of cut-off, whether announced or not, of water supply from Malaysia. And with Singapore’s water demand increasing at a rate of about 4% over the past decade due to the increase in population and economic development, the Singapore government has proactively engaged in the development of several water related projects to guarantee their self-reliance and sustainability.

SINGAPORE’S LARGEST SWRO PLANT

The Tuaspring Seawater Desalination Plant [TSDP] is a 25-year Design-Build-Own-Operate [DBOO] project undertaken by Hyflux. With a capacity of 318,500 m³/day [84 mgd], it will be the largest membrane-based seawater desalination facility in Singapore when completed in 2013. This is the
second and largest municipal desalination plant in Singapore that will be built using reverse-osmosis technology. The proposed plant will be located adjacent to the existing 156,000 m³/day (36 mgd) SingSpring plant at Tuas on Singapore’s west coast.

The TSDP will produce the world’s cheapest desalinated water at S$0.45/m³ ($0.36/m³; $1.36/kgal) once it is completed in 2013. This is made possible because of improvements in membrane technology, the larger scale of the Tuaspring Desalination Plant compared to its predecessor and the integration of an on-site captive 411MW power plant.

New water targets unveiled on 28 June 2010 indicated desalination’s bigger role in Singapore’s water supply. By 2060, Singapore plans to ramp up desalinated water capacity by almost 10 times, so that the Fourth National Tap can meet at least 30% of the water demand. Water demand is expected to double to 3.45 Million m³/day [760 mgd] by 2060.

Mr. Li Youqing, ROPV CEO said, “ROPV’s total quality management assures Hyflux and the PUB that they are receiving world class performance engineered pressure vessels. As the PUB continue its planned goal for long-term sufficiency to meet Singapore’s water needs, ROPV will continue to work hand in hand with the EPCs to help achieve this goal.”

ROPV supplied the TSDP with:

| SWRO 1000 PSI | 7 element with 3 inch sideport | 17 train x 216 units / train |
| LPRO 300 PSI  | 7 element with 3 inch sideport  | 9 train x 132 units / train  |

For a total of 4,860 pressure vessels that produces a capacity of 318,500 m³/day [84 mgd].

The quality of NEWater consistently exceeds the requirements set by United States EPA and WHO guidelines and is, in fact, cleaner than all current sources of Singapore’s water.

©2013 ROPV reserves the right to modify the design and specification contained herein without prior notice. Please contact your local ROPV sales representative for the most current information.