Our filament winding lab is capable of prototyping high-pressure pipes, T4 LPG cylinders, CHG cylinders, PU filament winding, and other filament winding applications. The key capabilities include 4-axial & 2-axial filament winding machines, burst pressure testing, and long-term hydrostatic pressure machine to evaluate the pressure-resistant performance of pipes.

TANK PROTOTYPING

Our mechanical testing lab is a GL certified lab, and can provide different kinds of property testing, including impregnated strand property, NOL ring interlaminar shear, unidirectional composite panel strength/compression/flexural/impact test, etc.

MECHANICAL PROPERTY TESTING

The capabilities of our CAE modeling lab can provide customers with conceptual design, material evaluation, cost appraisal, structure and process optimization.

COMPOSITE DESIGN & MODELING

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SingleEndRovings@owenscorning.com

GLASS REINFORCEMENT SOLUTIONS for High Pressure Tank Industry
Traditionally, LPG cylinders are made with steel, weighing up to 10kg more. New composite Type 4 LPG tanks are made using polyethylene, filament wound glass fiber structure, and epoxy resin. With the guarantee of same service life, the weight of new Type 4 LPG can be reduced more than 50% compared to traditional steel LPG cylinders*, and provides excellent corrosion resistance. In China, the LPG tank certification process is changing which will allow the market to readily adopt composite tanks and take full advantage of the benefits. In 2017, Owens Corning estimates that over 1 million composite LPG cylinders have been produced in the market. Main applications include automotive installations, as well as household use.

Cylinder design Glass reinforcement Type & characteristics
Type A, high-density polyethylene (HDPE) body wraps impregnated continuous glass fiber
Advantex® G-glass single-end roving for filament winding
- Excellent processing: Low fast properties resulting in smooth parts and less desire for cleanup, helping improved manufacturability efficiency and costs. Patented Tack-Pak® packaging provides virtually 100% transfer efficiency.
- Outstanding burst strength: Excellent glass/resin bonding providing high strength and high strength retention in demanding applications.
- Outstanding sustained wet out: Ensuring optimal part manufacturability, speed efficiency and costs.
- Outstanding corrosion resistance: Compared to standard E-glass, Advantex® G-glass helps with reinforced service life and strength of part over time in applications facing corrosive environments.

OWENS CORNING PRODUCT RANGE FOR LIQUEFIED PETROLEUM GAS (LPG) TANK INDUSTRY

Cylinder design Glass reinforcement Type & characteristics
Type A, metal liner reinforced with resin impregnated continuous glass fiber (full wrap)
Advantex® G-glass single-end roving for filament winding
- Developed for applications demanding excellent burst strength
- Approved for use in high-pressure vessels, suitable for epoxy and phenolic resins
- Very good aesthetic cylinder surface

Type B, metal liner reinforced with resin impregnated continuous glass fiber (full wrap)
- H-glass single-end roving for filament winding
- Provides significantly enhanced fiber properties for finished part performance
- Offers significantly high thermal performance and excellent corrosion resistance for all target markets.
- Meets Chinese GB standard GB8046 160

OWENS CORNING PRODUCT RANGE FOR COMPRESSED NATURAL GAS (CNG) TANK INDUSTRY

Cylinder design Glass reinforcement Type & characteristics
Type A, metal liner reinforced with resin impregnated continuous glass fiber (full wrap)
Advantex® G-glass single-end roving for filament winding
- Provides significantly enhanced fiber properties for finished part performance
- Offers significantly high thermal performance and excellent corrosion resistance for all target markets.
- Meets Chinese GB standard GB8046 160

Type B, metal liner reinforced with resin impregnated continuous glass fiber (full wrap)
- H-glass single-end roving for filament winding
- Offers significantly high thermal performance and excellent corrosion resistance for all target markets.

ADVANTEX® (® 158B) GLASS FIBER PROPERTY

<table>
<thead>
<tr>
<th>Property</th>
<th>Test-method</th>
<th>Unit</th>
<th>Advantex® G-glass</th>
<th>E-glass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber density</td>
<td>Proprietary</td>
<td>g/cm³</td>
<td>1.58</td>
<td>2.63</td>
</tr>
<tr>
<td>Flexural strength</td>
<td>Proprietary</td>
<td>MPa</td>
<td>482</td>
<td>1100</td>
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<td>Burst pressure</td>
<td>ASTM D2343</td>
<td>MPa</td>
<td>292</td>
<td>4050</td>
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<tr>
<td>Interlaminal shear</td>
<td>ASTM D2344</td>
<td>MPa</td>
<td>76</td>
<td>110</td>
</tr>
<tr>
<td>Compression strength</td>
<td>ASTM D2346</td>
<td>MPa</td>
<td>980</td>
<td>1200</td>
</tr>
</tbody>
</table>

* Data based on DOW TW103 epoxy resin + TW152 hardener. Impregnated strand fiber weight fraction is 65%.