OVERVIEW

ALTERNATIVE FUELS

OVERVIEW
TRANSFORMATIONAL GROWTH

in value-added steel processing, pressure cylinders and heavy equipment cab manufacturing. Headquartered in Columbus, Ohio, Worthington Industries and its joint ventures have more than 80 facilities in 11 countries and 10,000 employees; among which provide global customer service with multilingual sales, product and technical support teams.

THREE PRIMARY BUSINESS SEGMENTS

PRESSURE CYLINDERS
produced more than 87 million units serving the industrial gas, retail, energy and alternative fuels markets. (Results as of FY16)

CONSUMER PRODUCTS
Market-leading brands with products for home, industrial and equipment construction/repair; grilling; party decorating and outdoor leisure activities.

STEEL PROCESSING
processed over 7 million tons of steel in 2016; making it the largest purchaser of steel in the U.S. behind the auto industry. (Results as of FY16)

ENGINEERED CABS
manufactured 60,000 cabs and rollover structures for operators of large equipment vehicles. (Results as of FY16)

INDUSTRIAL PRODUCTS
Broad product line of steel, aluminum and composite pressure cylinders, cryogenic vessels, storage tanks and specialty components for industrial and commercial use.

OIL AND GAS EQUIPMENT
Custom solutions for energy storage, processing and transportation.

ALTERNATIVE FUELS
Clean vehicle fuel storage & systems for auto, fleet, marine, mine and rail.
OUR COMPANY

WORTHINGTON INDUSTRIES

Clean vehicle fuel storage & systems for auto, fleet, marine, mine and rail.
Our Type I CNG and bulk gas transport cylinders feature the lightest and safest steel protected by Longlife Powdercoat coating technology for extreme corrosion resistance. These cylinders are fabricated from 100 percent metal, typically a steel alloy. Our Type I CNG cylinders are certified to ECE R110 and made available to global markets outside North America.

CNG TYPE III CYLINDERS

Our CNG Type III cylinders feature a seamless, gas tight metal liner with full exterior composite reinforcement for extreme durability. When driving range and weight of a vehicle are critical limitations, our Type III ultra-lightweight composite cylinders are an ideal option. Superior fast-filling efficiency results in 15 to 28 percent greater storage capacity and driving range depending on the fast fill parameters. Plus, the use of quality material—aluminum and carbon fiber—and optimal design provide the most weight-efficient gas storage at a competitive price.

PRODUCT FEATURES:
- Seamless aluminum liner
- Excellent impact tolerance
- Greater heat tolerance
- No filling restrictions in hot or cold weather
- Superior fast filling efficiency
- Inherent leak before burst fatigue failure mode

CNG FUEL SYSTEMS

We design our systems with the end-user in mind. All systems are adaptable to the vehicle, provide industry leading performance and aerodynamics and cost-effective solutions for installation, maintenance and inspection. We currently offer three standard designs of both Type III and Type IV cylinder construction, each with various DGE offerings.
SYSTEM CONFIGURATIONS

HYBRID BACK OF CAB
Hybrid Back of Cab systems extend below the frame rail, providing greater fuel capacity with a lower center of gravity and improved aerodynamics.

VOCATIONAL RAIL MOUNT
Vocational Rail Mount systems are built tough for use in both severe-duty and over-the-road environments.

TOP OF BODY
Top of body configurations are ideal for refuse and transit bus applications and offer low profile dimensions without affecting fuel capacity.
LPG AUTOGAS

With more than 1,000 LPG tank models available from our manufacturing facilities in the US and Europe, we can provide the LPG tanks you need for alternative fuel applications. Our cylindrical, twin manifold and toroidal tanks are used for fuel storage in passenger cars, commercial delivery and recreational vehicles. The unique shape of our toroidal tanks allows the tank to be placed in the trunk of a passenger car. This gives more cargo space, ideal for taxis and fleets. Our LPG autogas cylinders are certified to all major international certifications. Product type approvals include UN ECE Reg. 67.01, TUV, ASME, CRN, TR TS 032 (EAC), CCOE and AS509.

HYDROGEN FUEL TANKS

Capabilities include Type III manufactured with an aluminum liner completely wrapped in epoxy resin-coated, aerospace-grade carbon fiber. Hydrogen cylinders range up to 14,500 psi (1,000 bar). Our hydrogen fuel tanks are certified to all major international certifications.
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<tr>
<th>Manufacturing Location</th>
<th>Product</th>
<th>Cylinder Type</th>
<th>Manufacturing Method</th>
<th>Certifications/Standards</th>
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<tr>
<td>Pomona, CALIFORNIA</td>
<td>High Pressure Composite Cylinders</td>
<td>Type III, Type IV</td>
<td>Plate Drawing, Tube Spinning, Filament Winding Carbon, Aramid, Glass Fiber</td>
<td>NGV2, DOT, FMVSS, AS9100, Facility Certifications: ISO9001</td>
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<tr>
<td>Salt Lake City, UTAH</td>
<td>CNG, Fuel Systems</td>
<td>Various</td>
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<tr>
<td>Location</td>
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<tr>
<td><strong>Jefferson, OHIO</strong></td>
<td>Low Pressure Welded Steel</td>
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<td><strong>Slupsk, POLAND</strong></td>
<td>Low Pressure Welded Steel and High Pressure Composite Cylinders, Fuel Systems and Multiple Element Gas Containers</td>
<td>Tube Spinning, RTM Molding, Filament Winding</td>
<td>Carbon Fiber</td>
<td>R110, EN12245, R67-01, ASME, TR TS032 (EAC), KGS Facility Certifications: ISO/TS 16949</td>
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<td><strong>Kienberg, AUSTRIA</strong></td>
<td>High Pressure Steel and Composite Cylinders</td>
<td>Billet Piercing, Tube Spinning, Filament Winding Carbon, Glass Fiber</td>
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<td>R110 Facility Certifications: ISO/TS 16949, ISO9001</td>
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Providing superior customer service is our goal. For assistance, please contact your regional sales managers.

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