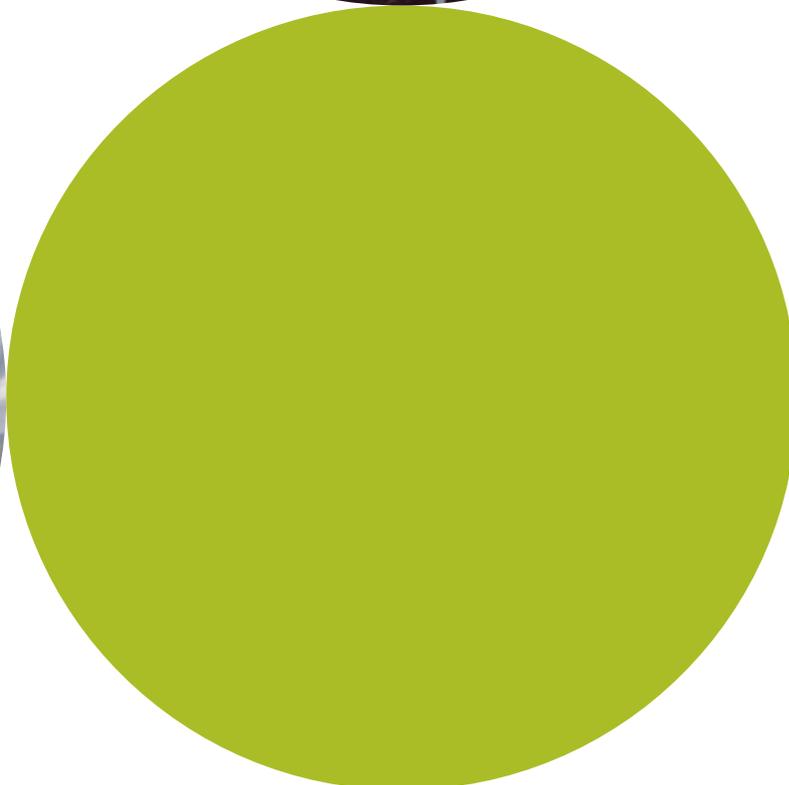




HYDRO

Extruded aluminum components

# Innovation at work





Hydro's mission is to create a more viable society by developing natural resources and products in innovative and effective ways. Courage, respect, determination, cooperation and foresight are values which help us achieve these goals . . . and values we live by.

*Hydro extrusion... Hydro innovation*

## About Hydro

**H**ydro is the extrusion technology leader and the third largest integrated aluminum supplier in the world. Involved in bauxite refining and primary aluminum production through advanced fabrication and manufacturing of finished products, Hydro employs more than 20,000 people in 40 countries and has activities on all continents.

Hydro's Extrusion Americas unit provides extrusion-based products and services in North and South America. What separates us from other extrusion companies is the strength of our casthouse and metal sourcing networks, the breadth of our engineering and manufacturing experience, the right balance of network integration and local empowerment, and our constant pursuit of process improvement and innovative product solutions.

Everyday, we help customers make better products and streamline their supply lines. Whether it's developing a tailored alloy, getting the most out of an extrusion press, suggesting design changes to enhance product performance and reduce fabrication complexity, or conducting an Extrusion Academy, we work hard to exceed our customers' expectations.

And, we believe that our work should protect the environment and contribute to our communities as it benefits our employees and customers. We are firmly committed to sustainability and mutual benefit, and assess our actions with this commitment in mind.

When you choose Hydro, you partner with a technology leader and global aluminum authority who can help transform your design ideas into viable, cost-effective products.

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- A leading global supplier of aluminum and aluminum products
  - Vertically integrated from bauxite refining through advanced fabrication and contract manufacturing
  - More than 50 years of extrusion leadership in North America and Europe
  - Integrated North American network of casthouse, extrusion, drawn tubing, fabrication, and contract manufacturing facilities
  - Unparalleled customer support and educational programs including our Customer Portal, for on-line order management, and Extrusion Academies
  - Committed to mutual benefit and sustainability. Hydro scored highest among aluminum companies in the 2009 Dow Jones Sustainability Indexes (DJSI) ranking.

***On our cover:***

*(Top left) Lightweight and corrosion-resistant aluminum extrusions used as structural elements in a playground system.*

*(Top right) Extruded aluminum structural frames, delivered JIT for the Nevada Solar One concentrated solar power plant.*

*(Bottom left) Unique twisted extruded aluminum supercharger impeller replaced previously cast part.*



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*At work and at play, Hydro extrusions are part of products you use every day*

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## Touching peoples lives

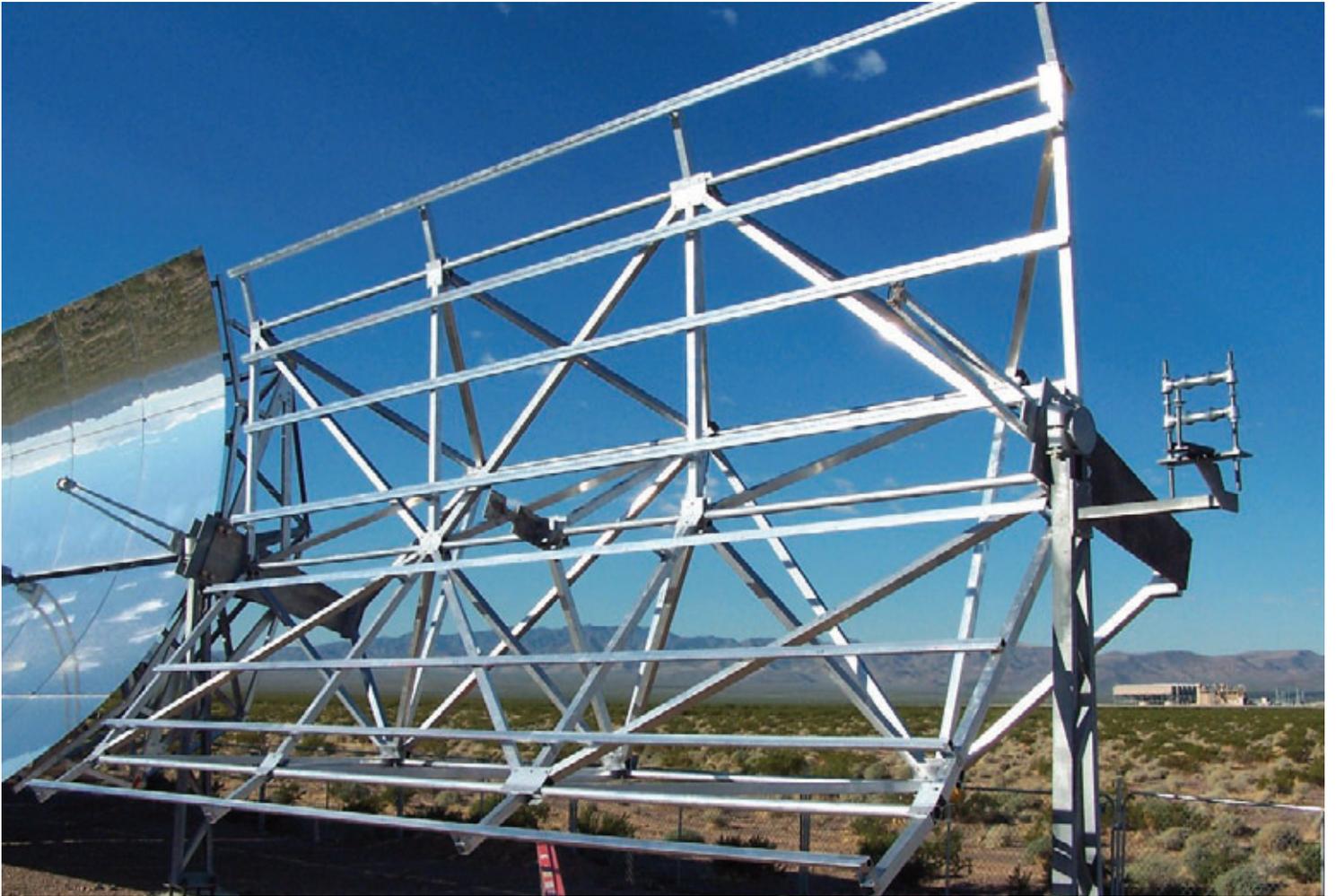
From the morning commute or a long day of making deliveries, to a fun day at the playground or a weekend camping trip, Hydro products touch people's lives everyday...and make their lives better.

Hydro makes extrusion-based components for a wide range of industries and is a leading supplier to many markets. We make more aluminum airbag canisters than anyone else in the world and produce more laser printer tubes than anyone else. We are the leading supplier of frames and mounting systems for concentrated solar power plants and produce innovative connectors used to join electric power line cables. We are the number one supplier of school bus window frames in North America and a leading supplier of extrusion-based truck assemblies.

We believe the best business partner is one who understands your business and markets as well as you do; a partner with experience in your industry and the ability to listen, learn, and apply knowledge across industries. A partner with a shared passion for creating the best products possible for your customers.

- 
- Consumer products
  - Building and construction
  - Windows & doors
  - Automotive
  - Trucks, trailers, and buses
  - Marine
  - Office & casual furniture
  - Electrical & industrial equipment
  - Renewable energy





*For Nevada Solar One, the largest concentrated solar power plant built in 17 years, Hydro not only extruded and fabricated all aluminum components, but procured and warehoused other necessary parts, delivered 45,000 lbs. of components, each day, over a nine-month period, and provided on-site assembly training.*

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*Giving you the edge with  
world-class technology*

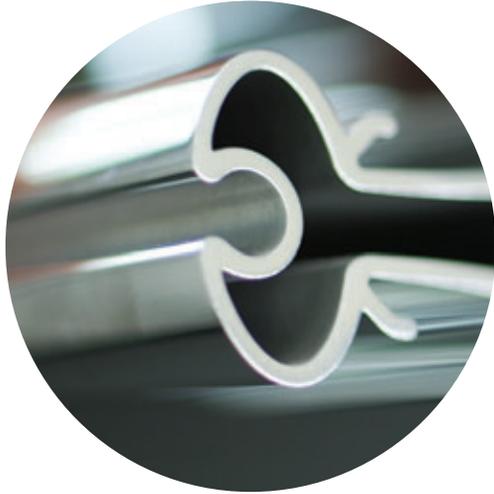
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## Extrusion technology



A typical extrusion press is over 10 feet high, 40 feet long, and weighs 25 tons with a polished piston more than a foot in diameter. More than 100,000 lbs. per sq. in. of pressure is needed to push a billet through a die and create an extrusion only inches in diameter with a tolerance as tight as  $\pm .005$ ". It takes sophisticated technology and a highly experienced workforce to effectively harness the powerful forces of this enormous machine. Hydro does this everyday...and does it better than anyone else.

Our success in producing high-quality components starts with our ability to consistently extrude aluminum sections with dimensional accuracy and superior surface quality. Hydro's management systems and highly experienced design engineers and press operators can ensure that your extrusion will meet design criteria, quality requirements, and delivery schedules.



Globally, Hydro operates more than 100 presses at 30 different facilities. On-going benchmarking, extensive knowledge and technology sharing, and application of best practices lead to innovation, consistency, and exceptional results across the entire network and help our North American extrusion facilities achieve the highest performance levels.

Three extrusion facilities in North America have adjacent casthouses to serve the needs of extrusion customers and facilitate the development of specialty alloys which can enhance end-product performance.

And, our industry-leading network of research and application development resources remains the source for high technical competence. Our Holland, MI Technology Center can assist with special design challenges and problem analysis, or help to solve difficult production issues.

We have the skills and resources to take on your most challenging extrusion project!



- 
- Hydro is the world leader in extrusion technology
  - Global network of 30 plants and more than 100 presses with extensive knowledge and technology sharing
  - Six strategically located extrusion plants in North America with presses ranging in size from 7" to 10"
  - Adjacent casthouses to support extrusion customers
  - Extensive use of prime-quality billet with high recycled content
  - Holland, MI Technology Center and access to research centers worldwide

*Using a process pioneered by Hydro, a previously cast supercharger impeller is produced from an extrusion with a tightly controlled twist. The result is a product free of pores, stronger and longer-lasting, with higher heat resistance.*

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*When looks matter,  
Hydro has the right finish*

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## Finishing

For a leading wind chime manufacturer, tubes produced by Hydro's St. Augustine plant hit the right notes. Aesthetics is a key component for their products' success and Hydro provides an unprecedented number of unique powder paint options to help achieve the perfect balance of looks and performance.

In North America, Hydro offers high-quality wet paint and powder coating, standard and clear "no-burn" anodizing, a variety of mechanical and chemical surface treatments, and special capabilities, such as non-skid and two-tone finishes. We also develop special

packaging systems and shipping procedures to assure that the finish is maintained through delivery. Some finishing processes utilize in-house capabilities, like St. Augustine's automated horizontal powder paint line. Others are coordinated through cooperative arrangements with long-term partners.

At Hydro, we have the systems and skilled operators in place to ensure that all finishes not only enhance appearance, but increase the durability and performance of your products.

- 
- Anodizing for standard applications and clear "no-burn" anodizing for welded applications
  - Vertical and horizontal paint lines
  - Polyester, epoxy, and polyurethane powder coatings
  - Two-tone, textured, and skid-resistant paints
  - All paint options meet or exceed AAMA Standards 2603, 2604 or 2605
  - Mechanical finishes including brushing, sanding, polishing, bead blasting, and tumbling





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*The right process for your  
most demanding tube  
applications*

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## Drawn tubing

Every hour of every day Hydro produces over 3,000 tubes that form a key element of imaging systems in laser printers and copiers... each tube produced with a tailored alloy and specialty drawing process to eliminate defects which could impact print quality. We also produce drawn tubing used in kayak paddles, baseball bats, leisure furniture, lawn care equipment, wind chimes, wheelchairs, and countless other products, all with unique challenges and demanding requirements.

When an application requires high strength-to-weight ratio, exceptional dimensional control, and superior surface finishes, drawn tubing is the answer. Drawing enhances the bending, flaring, and formability of the tube, allows for better ovality control, and enhances machinability.

Hydro is the North American leader in porthole drawn tubing and today produces more porthole drawn tubing than anyone else. We have unmatched capabilities and over 40 years of aluminum drawn tube experience. We can produce high-quality porthole and seamless drawn tubing to match all of your design requirements and help your product succeed.

- 
- Largest drawn tubing producer in North America
  - Porthole and seamless drawn tubing capabilities
  - Strategically located facilities in Florida and Arizona
  - Collaboration on all phases of product design and development process
  - Adjacent casthouses can customize alloys for optimal drawn tubing performance
  - ISO-certification and well developed quality control systems assure consistent quality

*A high strength-to-weight ratio helps produce a lightweight kayak paddle to help navigate the most challenging rapids.*

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*Uncompromising quality  
across a wide spectrum of  
services*

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# Fabrication

Starting with a single linear extrusion, we build door frames for Class 8 trucks using CNC bending, CNC machining, and advanced robotic welding. Quality fabrication requires advanced equipment, the right process, and, most importantly, fabrication experience. For quality fab, Hydro delivers!

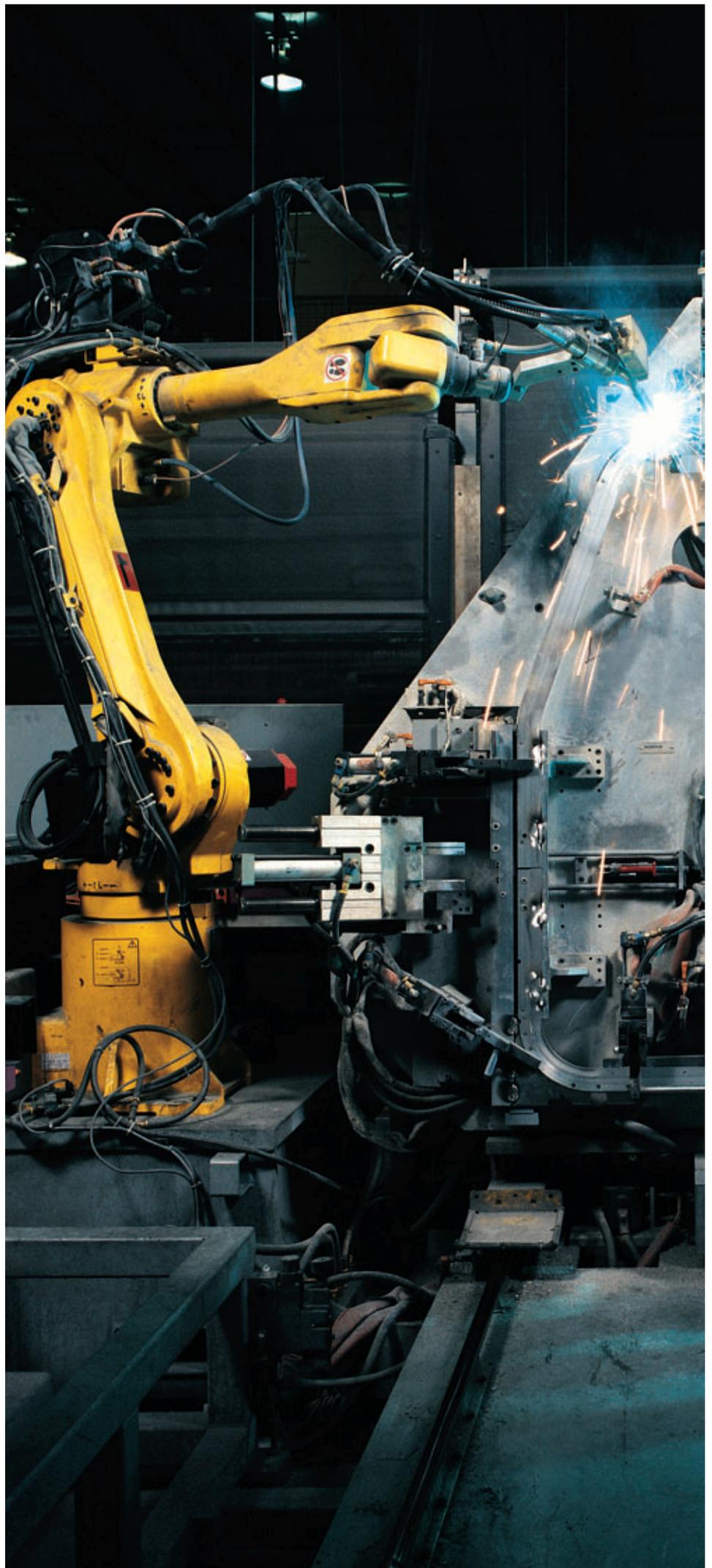
Today, most extruders offer some form of basic fabrication. Hydro offers an unmatched range of fabrication services and can deliver extruded aluminum components with high precision and tight tolerances ready for assembly ...or we can do the final assembly for you.

All of our plants provide basic fabrication such as sawing, drilling, and shearing. You can also rely on us for more complex plastic forming operations like stretch forming, and press bending; operations where aluminum extrusion knowledge and experience can mean the difference between success and failure.

We also offer leading-edge CNC machining, robotic welding, Friction Stir Welding (FSW – a method free from heat deformation and stronger than conventional welding), advanced adhesive bonding, and aluminum sheet fabrication.

Count on us for state-of-the-art fabrication services for small- and large-scale components and assemblies.

- 
- Rotary, stretch, chain, press, roll, and 3-axis CNC bending
  - Manual and robotic welding including FSW
  - CNC machining for milling, notching, tapping, lathing, and countersinking
  - High production punch and cut operations to advanced multi-step manufacturing
  - Close tolerance high-speed precision automatic sawing and automatic miter cutting
  - Aluminum sheet blanking, forming, and assembly



# Contract manufacturing



In Mexico, Hydro associates are assembling extrusions and purchased components into car seat sub-assemblies. In Florida, we are completing pole assemblies for U.S. military command tents. In Ohio, we are producing window frames for most of America's school buses and fully assembled SylvanSport GO's, ready for shipment.

At dedicated manufacturing facilities in the U.S. and Mexico, Hydro provides state-of-the-art contract manufacturing services for a wide range of industries including transportation, solar power, and consumer durables. We offer an array of engineering, process design, and program management services. We will employ

new technology, customize equipment, expand plant capacity, and make other investments to advance the manufacturing process.

Our plants are QS9001:2000 and TS16949 certified and provide the highest levels of advanced manufacturing featuring robotics, CNC technology, rotary stretch and CNC bending. Production Part Approval Process (PPAP), Advanced Product Quality Planning (APQP), and Just-In-Time (JIT) manufacturing programs ensure that your project will be professionally managed from start to finish. We are ready to perform any task required to take your product to the next phase of production.

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- Dedicated manufacturing cells
  - Just-in-time and line-sequencing capabilities
  - Product and process engineering
  - Quick turnaround prototyping
  - Component sourcing
  - Project management
  - Manufacturing-focused sites in the U.S. and Mexico
  - More than 600,000 sq. ft. of dedicated manufacturing space

*Going beyond traditional extrusion services, Hydro was involved from the early design stages of the SylvanSport GO and provides complete turnkey manufacturing. Extrusions from three Hydro plants are used at our Sidney, OH facility to manufacture complete trailers, which are shipped directly to dealers.*

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*The right metal for an  
energy-scarce world*

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## The green metal

Only 5% of the original energy used in primary aluminum production is needed to remelt aluminum products. This saves nearly 95% of the greenhouse gas emissions associated with primary aluminum production. And, aluminum can be recycled time and time again without losing any of its attributes.

Hydro is the leader in remelt technology and the use of recycled aluminum in metal production with nearly 30 remelt sites around the world. In 2008, Extrusion Americas' three U.S. remelt facilities used more than 200 million pounds of recycled aluminum in the production of primary-grade billet. The manufacturing systems we have in place ensure that all process waste is sorted, recycled, and re-used and we continuously implement new processes to use difficult-to-recycle materials such as painted aluminum from external sources. Typical products contain over 70% recycled content, from both internal and external sources.

We were among the first in the industry to be certified according to ISO 14001. And, we collaborate with our customers to support their recycling efforts; to help them produce better, more environmentally-friendly products that minimize the consumption of resources.

- 
- Only 5% of the energy used in primary aluminum production is needed to remelt aluminum
  - Aluminum can be recycled over and over again without losing attributes
  - Extrusion Americas recycles over 200 million pounds of aluminum annually
  - We collaborate with our customers to optimize their recycling efforts
  - Typical products contain over 70% recycled content

*Hydro has been included in the Dow Jones Sustainability Indexes (DJSI) every year since they were launched in 1999 and has scored the highest among aluminum companies in the DJSI ranking for four years in a row (2006 - 2009).*



## Remelt/Metal sourcing

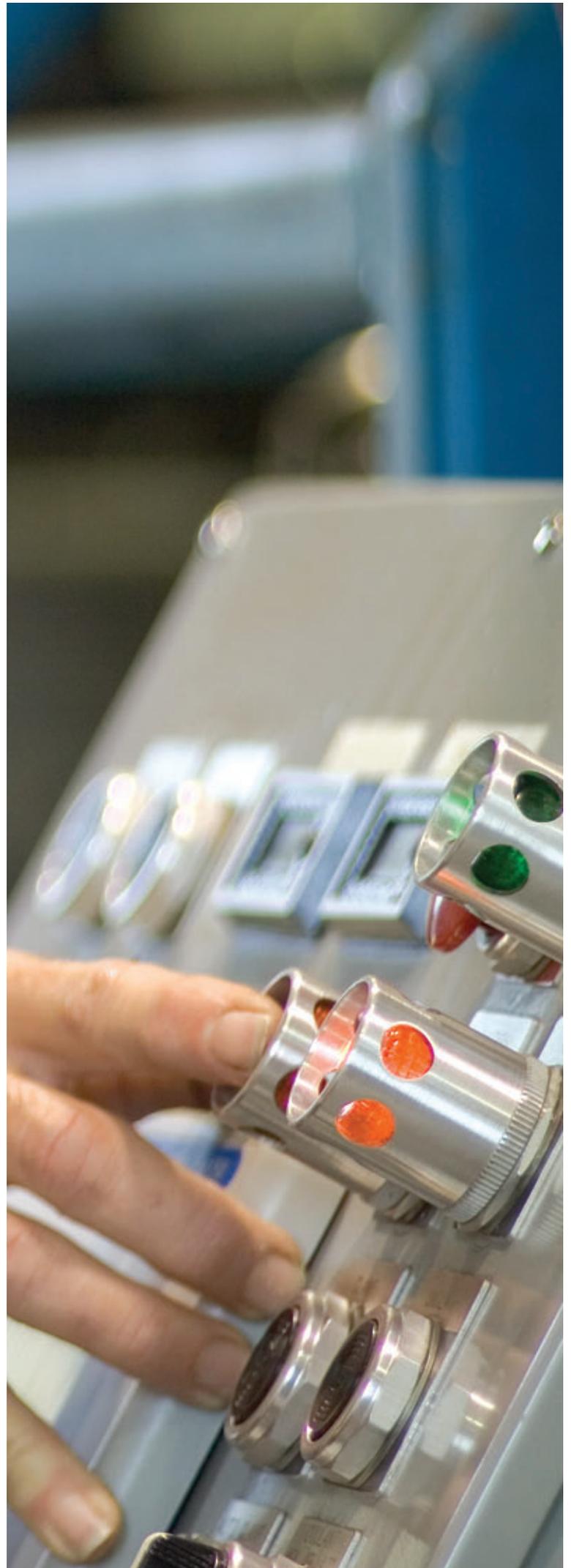


**W**e are committed to providing a steady source of metal for our customers. Sourced from our adjacent casthouses and Hydro's global metal network, we can ensure that you get the metal you need...when you need it.

Hydro is the leading supplier of aluminum billet in North America. We supply standard alloys in the 1000, 3000, and 6000 series and can develop custom alloys, if needed, to improve extrudability, manufacturability, and product performance. We have a knowledgeable and experienced staff who can guide you through the sourcing, purchase, and delivery process and can assist with aluminum alloy technology and extrusion processes. And, we can help you manage future metal needs and reduce metal price volatility.

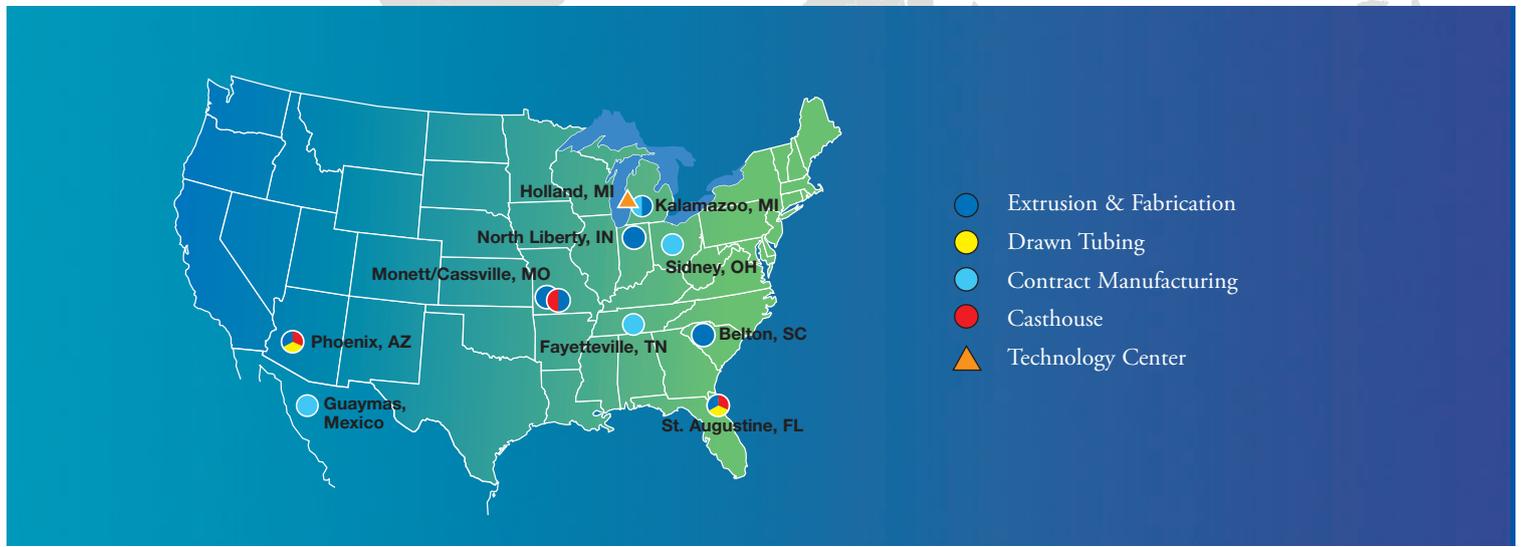
The North American casthouse network uses proprietary remelt technology to produce primary-grade billet with more than 70% recycled content, a key component for the production of "green" products.

- 
- Leading supplier of primary-quality metal with high recycled content
  - Adjacent casthouses can develop tailored alloys for improved extrusion performance
  - Technical support on aluminum alloy technology and extrusion processes
  - Future metal sourcing and price management



*An integrated network with  
global support and local  
autonomy*

# North American resources



Our Extrusion Americas network consists of 10 extrusion and fabrication facilities in North America with roots that go back over 50 years. Each plant has a unique set of capabilities to best serve its core customer base, and three have adjacent casthouses with capacity to produce more than 350 million pounds, per year, of primary-grade metal with high recycled content.

- Common information systems and procedures facilitate new program development and support easy transfer of work to accommodate fluctuations in demand or unique production requirements
- Our on-line Customer Portal provides metal market news and facilitates order placement, management, and tracking
- Our interactive CD-based Extrusion Design Manual and Extrusion Academies offer guidance for extrusion and component design to help simplify products and optimize costs

Contact the location nearest you to explore how Hydro can help develop more effective extrusion solutions for your product and markets.

## Hydro extrusion...Hydro innovation

**Belton, SC**  
Toll-Free Phone: (888) 935-5754

**Monett/Cassville, MO**  
Toll-Free Phone: (888) 935-5755

**Fayetteville, TN**  
Toll-Free Phone: (877) 829-8366

**Kalamazoo, MI**  
Toll-Free Phone: (888) 935-5758

**North Liberty, IN**  
Toll-Free Phone: (888) 935-5757

**Phoenix, AZ/Guaymas, Mexico**  
Toll-Free Phone: (800) 459-3030

**St. Augustine, FL**  
Toll-Free Phone: (800) 835-6502

**Sidney, OH**  
Toll-Free Phone: (888) 935-5759

**Hydro Solar Solutions**  
Phone: (602) 427-1434

**Transportation Components**  
Phone: (269) 492-1100

*A complete listing of Hydro global extrusion facilities can be found at:  
[www.hydro.com/en/About-Hydro/Hydro-worldwide](http://www.hydro.com/en/About-Hydro/Hydro-worldwide)*

## Accreditation and memberships



Aluminum Association  
[www.aluminum.org](http://www.aluminum.org)



Aluminum Extruders Council (AEC)  
[www.aec.org](http://www.aec.org)



American Architectural Manufacturer's Association (AAMA)  
[www.aamanet.org](http://www.aamanet.org)



Solar Electric Power Association (SEPA)  
[www.solarelectricpower.org](http://www.solarelectricpower.org)



Aluminum Anodizers Council (AAC)  
[www.anodizing.org](http://www.anodizing.org)

Hydro is a global supplier of aluminum and aluminum products. Based in Norway, the company employs more than 20,000 people in 40 countries and has activities on all continents. Rooted in a century of experience in renewable energy production, technology development and progressive partnerships, Hydro is committed to strengthening the viability of the customers and communities it serves.

**Hydro**

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