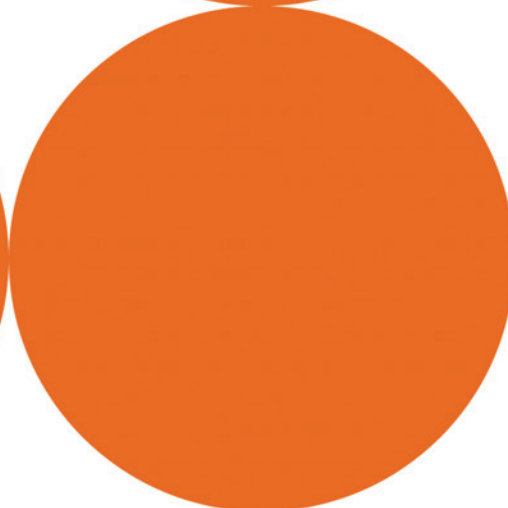
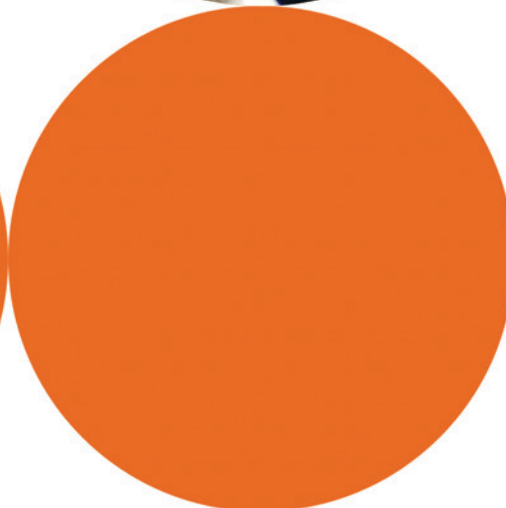
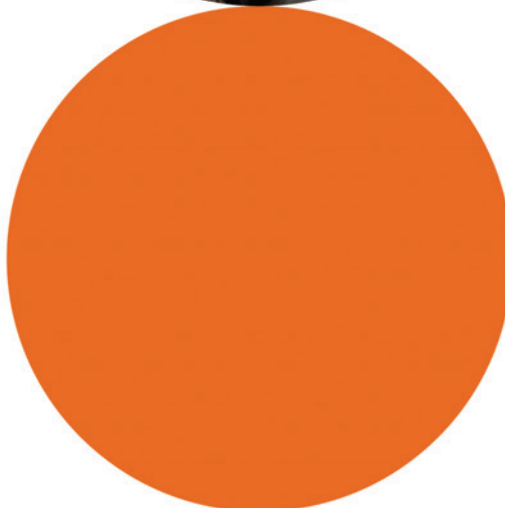
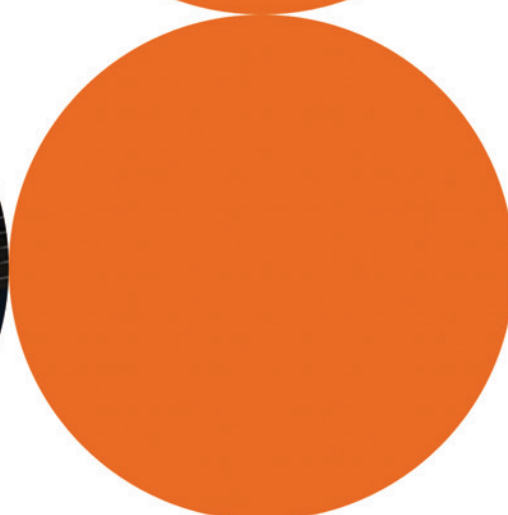
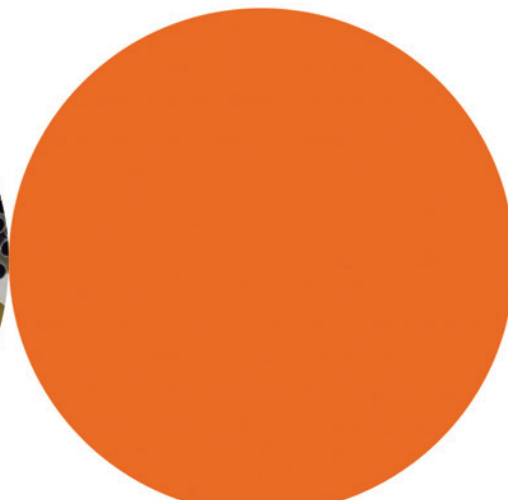




HYDRO

# Aluminum Drawn Tube

For performance-critical applications



# Hydro. The industry leader.



*Uniform wall thickness assures that drawn tubes used in wind chimes hit the right note. Superior surface finish helps laser printers and copiers achieve the perfect image. Hydro's production capacity is over 3 million photoreceptor tubes per month!*

**D**rawn tubing is the right choice when dimensional accuracy is critical and precision performance means the difference between product success and failure. Hydro is the North America leader in porthole drawn tubing with unmatched capabilities and the most experienced team in the industry. We have over 40 years of aluminum drawn tube experience and, today, from our two plants in Phoenix, AZ and St. Augustine, FL, produce more porthole drawn tubing than anyone else. And, we are committed to North America. Over the last two years, we have made nearly \$2 million in capital investments to upgrade our drawn tubing lines; to increase capacity, streamline operations, and further enhance quality.

We produce high-quality porthole and seamless drawn tubing in a wide variety of shapes and sizes to match your design requirements. We get involved early in the design process and collaborate with customers to develop the perfect tubing solution. Our adjacent casthouses can produce tailored alloys ideally suited for the cold drawn tubing process. Our own extrusion presses produce the tube stock. And we provide a wide array of secondary operations, including full assembly of final products, and numerous finish options. We control the entire process and are truly a one-stop-shop for all of your drawn tubing needs!

Typical product applications for drawn tubing include tent poles, antennas, flag poles, cable yokes, extension poles, archery arrows, paddles, golf ball retrievers, musical instruments, etc. Hydro has particular strength in the following markets:

- Automotive products
- Lawn and garden furniture
- Electronics and lighting
- Outdoor leisure sports
- Healthcare products
- Recreational vehicles
- Boats and marine accessories
- Laser printer OPC (organic photoconductor)
- Military

## **Drawn tubing advantages**

The drawn tube process provides exceptional dimensional control, added strength, and a superior surface finish. Drawn tubing increases mechanical properties and further refines grain structure, enhances formability, and can be



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



# From start to finish.

produced in thin gauges, below what can be done using only the extrusion process.

In addition to adding strength and exceptional dimensional control, ovality can be controlled more precisely in the drawing process than in the extrusion process. Drawing also enhances bending, flaring and formability of tubing and provides a superior surface finish that would not be attainable in an extruded product of the same alloy and size.

## Design collaboration

Our drawn tubing professionals will collaborate with you on all phases of the product design and development process. We will not only look at how the other product components are integrated with the drawn tube, but examine the end-product use to identify the part's essential functions. We will help you solve problems, develop prototypes, and provide an optimal drawn tubing solution.

## The right metal

With Hydro's North America metal casthouse network and two casthouses adjacent to our drawn tubing operations, we can meet the metal needs of our drawn tubing customers. We can more easily explore different alloy options and select the right alloy, or customize an alloy, to optimize your product performance and improve manufacturability. Hydro primary-grade billet uses more than 70% recycled content, which makes our drawn tubing ideal for the production of "green" products.



## The right process

Our state-of-the-art draw benches and precision roll straightening equipment allow us to manufacture tubing with extremely tight tolerances. Both drawn tubing plants are ISO-certified and well developed quality control systems assure consistent quality for both small and high volume production. In addition to round tube, we can provide a number of standard tube shapes including tri-flat, square, and fluted. Our porthole drawn tubing ranges in size from 0.500" to 2.500" OD, wall thicknesses from 0.027", and cut lengths of up to 30'.



*State-of-the-art equipment, rigid manufacturing standards, and continuous quality improvement programs help us achieve consistent quality with finished diameters and straightness that far exceed commercial tolerances*

## Fabrication . . . and more

We can perform a variety of end-forming functions at our Phoenix and St. Augustine plants including swaging, expanding, tapering, shouldering, and flaring. We can also precision cut, bend, weld, punch and drill holes, and perform brushing and deburring. For your complex fabrication and complete assembly outsourcing needs, we have dedicated fabrication and manufacturing facilities in the U.S. and Mexico and can provide a well developed project launch process and consultation in product analysis, process design, and assembly methods.

For an excellent finish, Hydro offers bright-mill finishes, high-quality wet paint and powder coating, standard and clear "no-burn" anodizing, mechanical finishes such as polishing, sanding and buffing, and chemical surface treatments.



## Drawn Tubing Capabilities & Equipment

In North America, Hydro has two strategically located drawn tubing operations located within Hydro extrusion facilities. Our adjacent casthouses produce primary-grade standard and custom billet using more than 70% recycled content. We offer a wide range of end-forming, fabrication, and assembly services. Finish options including bright-mill, anodizing, wet paint, and powder coating. We are *the* one-stop-shop for all of your drawn tubing needs!

### Phoenix, AZ

#### Drawn Tubing

- Size range: 0.500" - 2.500" OD
- Minimum wall thickness: 0.031"
- Maximum length: 28 ft.
- Multiple mechanical and hydraulic draw benches
- Computer controlled roll straighteners

#### On-Site Casthouse

- Typical alloys: 6063, 6061

#### Fabrication

- Multiple CNC machining centers
- Punching, stamping
- Drilling, notching, debur, cleaning
- Automated saw line and light assembly
- Victaulic grooving

#### Finishing

- Partnered painting
- Partnered anodizing

#### Quality Certification

- ISO 9001-2000

### St. Augustine, FL

#### Drawn Tubing

- Size range: 0.625" - 2.000" OD
- Minimum wall thickness: 0.027"
- Maximum length: 30 ft.
- Multiple mechanical and hydraulic draw benches
- Computer controlled roll straighteners

#### On-Site Casthouse

- Typical alloys: 6063, 6061, 3003, 1100

#### Fabrication

- Multiple CNC machining centers
- Precision cut-to-length as close as +/- .010
- Punch, notch, drill, tap, countersink, debur
- End-forming
- TIG/MIG and robotic welding
- Bending
- Manufacturing cells/assembly

#### Finishing

- 40' horizontal powder coat line
- 8' vertical wet paint line
- Partnered anodizing

#### Quality Certification

- ISO 9001-2000, ISO 14000A

### Hydro — Phoenix

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