

# Validation

Service center expands its precision metal-cutting capabilities and attracts customers with challenging expectations

**E**very business seeks it, but not every business finds it: the competitive advantage that places them a cut above the rest.

IRC Aluminum and Stainless, based in Portland, Oregon, was founded as a stainless steel and aluminum distributor in 1981. The service center shifted into high gear in 1995 when it purchased its first industrial waterjet cutting system. At the time, IRC envisioned the investment as a way to separate itself from its metal service center peers and gain an edge in serving the growing aluminum boat building industry in the Pacific Northwest.

As its operational knowledge and experience with waterjet technology grew, IRC's precision metal-cutting business blossomed, paralleling the growth of aerospace, high-tech and energy-related industries operating in the Northwest. More recently, the company expanded its reach to encompass much of the West Coast, with customers as far south as San Francisco and Los Angeles.

IRC also bolstered its waterjet cutting capabilities. Today, it operates four large-format waterjet cutting systems, running each on two daily shifts at its 23,640-square-foot Portland facility. The latest acquisition is the Flow Mach 700 with a table measuring 13 ft. by 26 ft. that can cut parts up to 26 ft. long and 11 in. thick.

## Special metals

With a reputation for cutting expertise developed over 25 years, IRC gets a healthy share of difficult cutting jobs. While its core competency is processing stainless steels and aluminum, the shop also cuts titanium, niobium, zirconium and other high-end materials. On any given day, IRC may be working on architectural or signage parts with intricate details, specialized aerospace parts made from



Valentin, left, and Miki in front of IRC's new Flow Mach 700 waterjet cutting system.





titanium or aluminum, or industrial and valve parts that use stainless steel.

“Most of the parts we cut are produced to near-net shape because the customer will be performing additional machining and finishing operations,” says Valentin Josipovic, IRC’s general manager. For high-volume, long-run production jobs like these, he says that every bit of cutting knowledge is needed to maximize yields and profitability.

### Quality trials

IRC maintains a rigorous program of internal testing, carefully evaluating the best equipment and abrasive for each new material to be cut. “Our standard test was designed by Miki Drlja, who has been leading IRC’s waterjet operation for 20 years, and involves 2-in. stainless steel, running parts at different cut qualities and

### Cutting 6-in.-thick titanium with 80 HPX and two Trident 2 cutting heads.

speeds,” Josipovic explains. “Then, we evaluate individual cut quality for taper, edge roughness and dimensional tolerances.”

Tests are done for different abrasive types and grades with samples saved for future reference. Josipovic adds, “We continue to validate our ongoing cutting results, combining them with our experience, to make projections about what abrasive and material combinations work best.”

Such trials prove to be of value because customers frequently bring new jobs to IRC that involve tougher materials and thicker cuts, from 1.5 in. to 11 in. In one series of tests cutting titanium, Josipovic and his team compared using Barton Adirondack HPX hard-rock garnet abra-

sive against 80-mesh alluvial garnet, a traditional general-purpose abrasive.

While the team expected the sharp-edged HPX garnet to yield better cut quality on this tough metal, they discovered that the greatest benefit of the HPX was improved cutting speed, especially on thicker cuts.

The speed differential wasn’t merely effective on titanium, but on every metal tested. “The biggest advantage with HPX is speed—the waterjet machines can cut parts faster while achieving the same cut quality,” states Josipovic. “Once the material thickness goes above 1.5 in., we see big advantages, visible gains in cutting time that range from 5 to 25 percent. These test results clearly justified the higher cost of the high-performance HPX abrasive.”

### Value equation

“Experienced waterjet engineers and operators understand the HPX value equation,” says Thomas Riggs, Barton waterjet market manager. “Customers can be confident in the purity of Adirondack HPX garnet and the quality of the cut achieved—an important factor in long duration cuts on expensive material.”

IRC selected HPX as its standard on cutting heavy-gauge material, which may include aluminum and titanium for aerospace applications or stainless and other alloys for industrial applications. “We serve many companies that build and maintain oil and gas pipelines,” Josipovic explains. “Think about the size of the valve bodies and mounts used in 5-ft. or 8-ft.-diameter oil and gas pipelines. That’s what we mean by thick.”

To meet demand, one of IRC’s waterjets runs only HPX garnet abrasive, with others switched over to HPX based on production needs. To protect valuable parts and materials from waterjet backslash,

# Waterjet Technology



Waterjet operator sits on four stainless steel flanges cut for custom-made gate valves.

IRC also uses Barton Hydrobloc bricks, which Josipovic says last longer than other bricks and don't produce contaminating debris in the garnet slurry.

## Proven uptime

To maximize gains in production speed, equipment uptime is essential. One of the major causes of downtime on waterjet cutting equipment is the need to constantly replace the orifices on cutting heads. "We would change ruby or sapphire orifices on an almost daily basis. That meant you had to shut down the waterjet, then disassemble the cutting head, replace the orifice and reassemble it," Josipovic says. Each replacement was a 10- or 15-minute job.

So, the introduction of a diamond cartridge system like Barton's Trident promised big improvements in equipment reliability. When Josipovic and his team tested the cutting head, "The difference was night and day," he recalls. "You put in that orifice cartridge and you won't have to worry about it for months at a time. I have had Trident orifices that lasted an entire year—which is just unbeatable."

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Stephen Podnorszki, waterjet parts manager for Barton, explains that "the replaceable Trident cartridge combines the diamond orifice and carbide mixing chamber, which are the major wear components of a cutting head. Compared to sapphire and ruby orifices, the diamond orifices used in the Trident not only last far longer but also deliver an optimized cutting stream." The result, he says, is longer mixing tube life and increased cutting power, especially in high-pressure (87K to 100K psi) waterjets.

That's certainly been the experience for the IRC team. "Longevity and reliability are the driving factors for me," says Josipovic, who now runs Trident cutting heads on three of IRC's waterjet machines.

And, when it's time to replace the ori-

files, the task is easy and fast, says Podnorszki. "Replacing the Trident cartridge essentially restores the functionality of the entire cutting head to new."

By focusing on specialty waterjet cutting, IRC Aluminum and Stainless emerged as a go-to service center. By continuing to build on the knowledge gained through internal testing and new challenges, the company plans to remain a cut above the rest. **FFJ**

**Barton International**, Glens Falls, New York, 518-798-5462, [www.barton.com](http://www.barton.com).

**IRC Aluminum & Stainless**, Portland, Oregon, 503/228-7110, [www.ircalum.com](http://www.ircalum.com).