



Metals fabricator turns idea into titanium palm tree

When people picture Vancouver, British Columbia and the majestic mountains and countryside that frame this Northwest Canadian paradise, they're more likely to envision pine covered slopes and forests. B.C.'s Coast Mountains have their share of Douglas fir, but a lone, defiant palm tree rises up from the ground nearby, firmly planted in the yard of John Ellett, Owner of Port Coquitlam-based Ellett Industries, Ltd.

By Kirk Richardson, RMC, USA

Ellett's palm isn't of the California variety of the *Arecaceae* botanical family swaying to and fro dropping dates. But it may yet bear fruit if landscape architects catch wind of it. What makes this tree so unique is that it is made of lightweight, high strength Grade 2 Titanium (unalloyed). The saltwater corrosion resistant yard art will outlast its owner and likely every tree rooted in nearby Whistler. The Ellett's own an ocean front home on Vancouver's Sunshine Coast, so having metal artwork that will withstand most harsh elements is a real factor. Others have fabricated metal trees, but never with titanium and never with so much ingenuity and creative flare. Lyle Osberg and Terry Horton were challenged by Ellett to turn his dream into the world's strongest palm. Osberg, Ellett Industries' Operations Manager, explains that the challenge was designing

a tree from metal and making it look real.

"We had to make the palm tree look realistic, not just mass-produced pieces, although we were confined to utilizing conventional manufacturing methods used in industry."

To help accomplish that goal, Horton (Plant Manager, Piping Division) and Osberg enlisted the help of a fellow Ellett employee, who was raised in Borneo, to keep the special project from turning into something looking more like a lamppost. "With the trunk, we had to come up with a way that looked artistically like bark on a palm tree and make it look like it had a random nature to it," recalls Osberg. At the same time, the fabrication team had to design the unique branches and fronds to resemble a palm but not make it so "shredded" that it would be dangerous to handle or for a person to walk near it. "We ended up growing a banana palm!"

From concept to reality

Their ideas went from mind to sketches to AutoCAD. A shop floor employee used the CAD file to laser cut the first .078-thick leaf. With titanium's melting point of 1668°C and a Brinell hardness number of 717 MPa, shaping the leaves from titanium sheet with ordinary gardening shears was out of the question. According to Osberg, fashioning them to look random but similar to a leaf was a bit of a challenge. "We had to bend them a little," he recalls. "We moved some fronds in and some out so that it made a 3D effect to it rather than being flat."

The clever metal arborists also designed the leaves' stems so that they narrow where they attach to the trunk. "That way, when we get a little bit of a breeze, the leaf will twist a little bit, sway in the wind," says Horton, who is quick to point out that even a titanium

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tree is susceptible to high winds like hurricanes. Even though the sturdy piece of art is bracketed and bolted into a concrete base, "It might not be stronger than Mother Nature," laughs Osberg. The group recovered random pieces of titanium that it had available in its industrial recycle yard. "When you're in the titanium business and you see various artistic things, especially with colored titanium, and you look in a big bin full of bits and pieces of titanium, you can't help but think that maybe there's an artistic use for some of that remnant material," observes Osberg. Horton's team used a four-axis laser cutter to transform some of their crop pieces of pipe into Ellett's tree trunk complete with bark, giving it has a kind of broken-stem effect. "The trunk is a piece of fabricated pipe that we rolled and welded," he says. "The tree bark is laser-cut in the pipe, then bent outward to give it a three dimensional look," he explains.

Unique skill set required

Other parts of project required titanium fabrication finesse, rare skills that few in the world have the opportunity to hone. "The welding was mainly on the top of the tree, the making of each bough branch, and then attaching it to the top section," notes Osberg. "We had to utilize all of our welding and purge techniques to get a high quality welded joint."

During the process, purging with argon ensured that the weld seams didn't oxidize and negatively affect strength and corrosion resistance. "Other than that, it was traditional pressure vessel fabrication, with an artistic eye," he says almost nonchalantly.

In fact, putting together a titanium palm tree is not quite as simple as assembling



The stems of the leaves narrow where they join the trunk so they move slightly in a breeze. Achieving a realistic shape was a challenge.



For a realistic 3-D effect, the tree bark is laser-cut in the pipe, then bent outward.

a bicycle. "We concentrated on making the top half of the tree so it could bolt onto the bottom half, so that we didn't have to ship it all as one piece," explains Osberg. The top also had to be relatively easy to manually lift and place on the trunk. "The nice thing is the weight savings," he states. "If you make this out of stainless, it would be very heavy and very difficult to put up in your back yard. Titanium is a lot lighter. We've made quite a few things out of titanium, where we take advantage of that strength to weight ratio." Aesthetics were also important. "We had to come up with a way of fastening the top to the bottom, but hiding all the fasteners so that it didn't look like something bolted together from a quick manufacture," explains Osberg. "We had to design things to conceal the fact that it was manufactured parts bolted together. We spent a fair amount of time getting that right, so that there wouldn't be any exposed fasteners that would detract from the view." To be fair, Ellett Industries had some practice at this in the past, having designed artwork from other metals. For example, "There is a stainless steel crab down at our planetarium here in Vancouver that is probably one of the most photographed pieces of metal artwork in the country," reports Osberg. At one point, the Canadian company also designed and built an artificial maple tree. "So we do have a bit of a history of making architectural items from stainless," he continues. "A natural progression was to make one out of titanium."

Inspiration for further works

From start to finish, Osberg estimates that the project took four months to complete. "You kind of get ideas, and you go a certain stage, and then develop it as you go," he remembers.

The fruits of the team's labor should be enjoyed for many years to come. "A titanium palm tree will last forever if it's placed in the right location," predicts Osberg. The original design quickly caught the eye of Ellett's neighbor, who immediately requested a Palm tree of her own. Her new tree, (shown in the photographs), became the focal point of her urban garden and has been drawing interest from her friends ever since. The Ellett team is already working on the next generation tree, which it hopes to market in sophisticated landscape architecture niches. However, Osberg and Horton aren't ready to share the secrets of Palm Tree 2.0 just yet. The photographs give a good visual of Ellett's artwork, however seeing the tree during various times of the day and throughout the seasons allows you to see exactly how stunning a titanium Palm Tree truly can be. Ellett predicts their 'titanium tree art' will be sprouting up in all corners of the globe. "One tree strategically set in a garden is absolutely gorgeous," observes Osberg. "Now let your imagination go crazy and visualize how fantastic a grove of several titanium Palm Trees would look growing on your piece of paradise, wherever your oasis may be in the world." Meanwhile, John Ellett is content enjoying his artwork during comfortable Vancouver summer nights, when he's not traveling the world and lounging under the real thing. Ellett has enhanced the lustrous, glass-bead-peened finish of his titanium palm by adding colored lights that run up the inside of the trunk. Someday, he hopes to wander into a whole grove of lighted exotic metal trees at some seaside resort, knowing that an idea sparked by his imagination and built on Ellett's ingenuity grew into beautiful, durable field of art that others can enjoy forever.

Ellett Industries has been designing and fabricating equipment for a variety of process industries including stainless steel, nickel alloy, titanium, and zirconium heat exchangers, pressure vessels, towers, reactors, crystallizers, evaporators, tanks and pipe spools, starting with copper steam kettles way back in 1921. Since then, the company has also designed and produced several pieces of long-lasting metallic art, which are still enjoyed by many today.