Everyone’s first reaction, upon seeing the pump for the first time, is to ask, “What’s that?” This is followed by “We’re not going to need that around here.” Close on the heels are statements that the snorkel looks heavier and bulkier than what they are used to. Granted, the snorkel pump makes the standard bucket 45 pounds heavier, but you can remove the bucket’s 20 pounds of lead ballast. (Lead is no longer needed to keep the bucket from spinning in forward flight as the offset mounting of the pump now performs this function.) Twenty-five pounds extra weight is a small price to pay for the efficiency gained.

Once the snorkel pump is put to work, though, all skeptics are quickly put to rest. Even I, who believed in the snorkel idea, had no idea just how useful it would be on practically every fire we worked. It has gotten to the point that our pilots feel like they have an arm tied behind their back if they have to use a bucket without the pump.

Our first experience putting the pump to good use came on its first assignment in the Kaibab National Forest on the north rim of the Grand Canyon in 2005. This particular area of the “Arizona Strip” is arid, desert-bleached Pinyon and Juniper trees with little water available. Due to the lack of available water, we were directed to a remote Pumpkin (SEI portable water tank), only to find it was only a third full, or about 2.5 feet deep. As we now do every time this happens, we load the bucket on its side in the water and then stood it up. This got it about half full. We then moved the thrust-activated cyclic switch to turn on the 425-gallon-a-minute pump, and it topped off the bucket in about 15 seconds.

This effectively doubled the amount water delivered to that fire without adding extra flight time or expense. Imagine it this way, every helicopter left a pumpkin carrying 15 to 30 percent additional water, on a feet-wide basis. That would conservatively translate to millions of gallons of additional water delivered per season. With the extensive use of pumpkins as dip sites for water buckets, this is an area the snorkel pump can consistently pay off. If 10 percent more water delivered is the equivalent of 10 percent more helicopters in the air (at no additional expense), then the Bambi PowerFill is truly a force multiplier that cannot be ignored.

On another fire, in Sedona, Ariz., in 2006, with a full pumpkin available, our Bell 212HP was out-delivering a Bell 205+ because its 324-gallon bucket was too large to fully submerge. It had to leave with a partially full bucket.

An interesting thought to ponder is that all the assumptions made by interagency decision-makers for their best-value performance calculations based on pennies per gallon of water delivered, are figured on full buckets. In fact, these numbers are valid only if everyone flies with their buckets full all the time. The government assumes this to be true, but, as we’ve seen, it’s frequently not the case.

One of my favorite stories about SEI’s snorkel happened in 2006 in Grants, N.M. Over the radio, a local engine captain, exasperate to the fire, radioed our helicopter pilot with the message, “Don’t bother hooking up the bucket, because there is no water around here.” But, he was too late, and we didn’t know any better. Shortly after his radio call, our pilot on the job, Eddie Thoroughgood, emerged over the fire, dumpind his first full bucket of water on the flames — in full view of the fire-ravaged engine captain.

The fire was out shortly thereafter... but maybe we should have just let his crew dig line and throw dirt at it?

JUST ADD A LONG LINE

When the efficiency of the snorkel is combined with a 100-foot (or more) long line to access streams, forest ponds confined by trees or any other normally inaccessible water source, anything “wet” becomes fair game and maximum efficiency is sure to follow.

This was taken to the extreme in Yosemite National Park in California in 2006 when working a fire at the top of El Capitan. We were able to utilize a creek running up the west side of El Cap that was 200 feet from the edge of the fire line. With designated dip site for Skycranes a 20-minute turn away, our Bell 212HP out-delivered a Skycrane that day!

Regarding the assignments worked in and around the Sierra National Forest in California, Patrick Basch, a USFS forest aviation officer said this about the Bambi PowerFill
TANKS BUT NO TANKS

Okay, some of you are probably wondering how the Bambi PowerFill snorkel stacks up to a typical fixed belly tank.

Fixed tanks excel in both the wildland urban interface and grass and brush fire environments. They are used primarily for connecting "trail drops" and cooling the fire line down for the ground crews. Buckets, on the other hand, excel in forest/heavy timber and mountainous terrain environments, concentrating on precision drops to hot spots, as well as making trail drops.

Heli-1 has a fixed belly tank as vendor-offered additional equipment to our exclusive-use fire contract H-510 in Chester, Calif. During the outbreak of the October 2007 Southern California fires, our belly tank was requested and supplied.

We found, though, that once our tank arrived, most aircraft on scene were already "tanked." This made our longline- and snorkel-equipped Bambi Bucket somewhat of a novelty. That novelty soon turned into name-requests for H-510, due to its versatility and ability to remain well above the fire and not fan the flames. Even though most of the tanked helicopters were hydrant filling, our turn times were still quicker, as we were able to access numerous neighborhood swimming pools.

Once the Santa Ana event subsided and fires were under control, mop-up operations began, with precision drops on hot spots the order of the day. And, even here, tanked helicopters could not keep up with the snorkel/long line combination.

The Bambi PowerFill snorkel also has no downtime to reconfigure the aircraft for long line/cargo missions. We have found the snorkel will do almost everything the fixed tank can, with the ease of deployment of a bucket. The fixed tank has in fact become a monkey on our back due to the difficulty in transporting, mounting, dismounting and handling of such a bulky and heavy piece of equipment. After having used the Bambi PowerFill snorkel extensively for three fire seasons throughout the western U.S., it is my opinion this additional capability, now available to enhance the performance of the battle-tested Bambi Bucket, is a winning combination that cannot be beat. It is my opinion this additional capability, now available to enhance the performance of the battle-tested Bambi Bucket, is a winning combination that cannot be beat. It is my opinion this additional capability, now available to enhance the performance of the battle-tested Bambi Bucket, is a winning combination that cannot be beat.

TOP RIGHT The snorkel is always attached to the bucket, it is always ready when needed (which, in my experience, is conservatively 80 percent of the time). The bucket still operates like other Bambi Buckets when the pump is not needed. And, if the pump ever became inoperative, the bucket will still work normally (unlike a fixed tank). At Heli-1, we have had no experience with failures to this point, and have not required any unscheduled maintenance in three full fire seasons of use.

COMPANY PROFILE SEI INDUSTRIES

Out in the Wilderness

FROM FIRE FIGHTING BUCKETS TO ENVIRONMENTAL PROTECTION, SEI HAS MADE A NAME FOR ITSELF CREATING PRODUCTS THAT ALLOW COMPANIES TO WORK IN AND PROTECT OUR WILDLANDS.

When the Bambi Bucket went into production 25 years ago, its inventor, SEI Industries founder Don Arney, couldn’t have foreseen the big orange bucket would become synonymous with helicopter fire fighting worldwide.

In fact, it was the Bambi Bucket that kick-started SEI, based in Delta, B.C., into the design, manufacturing, marketing and commissioning of structural-engineered fabric products. These product lines are not only popular in the aviation industry, but cover the remote site logistics supply, environmental and fire fighting industries.

A four through the company’s 60,000-square-foot manufacturing facility gives you a better indication of just how SEI is utilizing its engineered fabrics, and a lot of technology, to develop a variety of unique products. Currently, the company has in place new computerized laser cutters (each bucket used to be cut by hand); electronic radio-frequency welding equipment for industrial coated fabrics; metal welding, sewing and machining equipment; an in-house fabrics testing laboratory; an 11,000 Can-gallon (13,200 US gallon) test tank with crane; and in-house computer systems. But, it all began with just one idea.

THE ORIgINAL BUCKET

Folklore will have you believe the bucket got its name from a sultry waitress named Bambie, who worked at a famous firefighter bar in Boise, Idaho. In fact, Arney originally planned to call it the SEI-Flex, and the real, though less exciting, story...
came out in an interview with a B.C. university magazine in 2003. “He (Dr. Bill Fortune) interviewed me on a show about inventors and we became friends. One night over dinner, he asked me what I was going to call it. I didn’t want to talk business, so I said, ‘The Bambi Bucket’ — I was just being good. But he said it was a great name and he was relentless in pushing me to keep it.”

Back then, fire fighting buckets were nothing new, but what Arney was able to perfect that others couldn’t was a valve to deliver a concentrated column of water. Today, despite the onslaught of new competition, SEI still controls over 90 percent of the fire fighting bucket market. Since the Bambi Bucket was first introduced in 1983, not much has changed to the water-carrying vessel itself. “We still have customers sending us in their 20-year-old burgundy-colored fabric buckets for repairs,” said Shawn Bethel, manager of SEI’s fire fighting division. “All we typically have to do is change a few components and these old Bambies are fire ready!”

Bethel joined SEI in December 2007, after 22 years with B.C. Ministry of Forests and Range Fire Protection Program, including 12 years in its rappel program. He was also a provincial fire control officer, and worked on incident management teams. “I guess you can say that I know the Bambi Bucket well,” he quipped. “The bucket has been around for so long — people know it, and they know what they are getting when they order a Bambi Bucket. It’s a well-proven product.”

AN EXPANDING LINE

Available in over 20 different sizes ranging from its smallest 886072 72 US gallon (270 liter) bucket, to the HL9800, 2,600 gallon (9,840 liter) version, SEI sells about 400 buckets a year. The company has also added 12 options that can be added to its bucket line, which, said Bethel, ranges from “the variable-drop Aqualanche valve, PowerFill snorter, and Dragon Eggs, as having an area protection. “We are always working with our customers and fire control agencies to incorporate their feedback toward improving what we are doing and developing new products to meet the demand of the industry”, said Bethel. “The gel bucket, though, might actually have the biggest success in North America.” We really do see gel as the new way of fighting fires, because it has much more capability over foam,” said Bethel, explaining that gel acts as a water enhancer. “When gel dries, it can be re-hydrated and provides bottom-filling capability in shallow water sources at a rate of 450 gallons US a minute. The technology is getting gleaming reviews. Said Wayne Coulson, president and CEO of Coulson Aircrane, “For the past three seasons in Australia, the Bambi Tormentula Bucket with PowerFill accessory has done an excellent job for us with 100 percent availability over several hundred hours of operation.”

Other new non-bucket related fire fighting products include the Red Dragon aerial ignition device. Controlled using a remote, the Red Dragon uses a variable-speed tether, which allows it to adjust to the dispersing speed, rather than having the helicopter changing flight to adjust to the machine’s drop rate. This enables dispersal of SEI’s Dragon Eggs in perfect concentration levels according to the terrain.

OTHER SECTORS

Within helicopter circles, SEI, which employs about 100 people, is best known for the Bambi Bucket, but it represents only about half the company’s revenues. Bethel said that one of the most sought after add-ons is the PowerFill product. Available both internally in the multi-dump valve or as an externally mounted snorter on the standard valve buckets. PowerFill is retrofittable and provides bottom-filling capability in shallow water sources at a rate of 450 gallons US a minute. The technology is getting gleaming reviews. Said Wayne Coulson, president and CEO of Coulson Aircrane, “For the past three seasons in Australia, the Bambi Tormentula Bucket with PowerFill accessory has done an excellent job for us with 100 percent availability over several hundred hours of operation.”

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SEI’s Dragon Eggs are currently aimed at a new laser cutter for cutting Bambi Buckets in a matter of minutes, instead of the few hours it used to take to cut the material by hand. SEI’s new Dragon Eggs can manufacture the bucket in 20 different sizes, from 72 US gallons to 2,600 gallons. It sells about 400 buckets a year. Mike Reyes Photo

“Within helicopter circles, SEI, which employs about 100 people, is best known for the Bambi Bucket, but it represents only about half the company’s revenues.”

making your water go further: It’s far superior to foam in many ways and with new technologies meeting or in some cases exceeding environmental regulations, it has good potential to be embraced by more agencies in the industry.”

Bettel acknowledged that SEI is exploring other options, too, including the possibility of a lightweight fixed Bambi Tank. Unfortunately, he won’t divulge any more information than to say the company has a close eye on the tank market. In the meantime, SEI, through its Bambi Bucket product line, continues to provide its customers with their choice of single- or multi-dump buckets and the many innovative options that go with them.

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