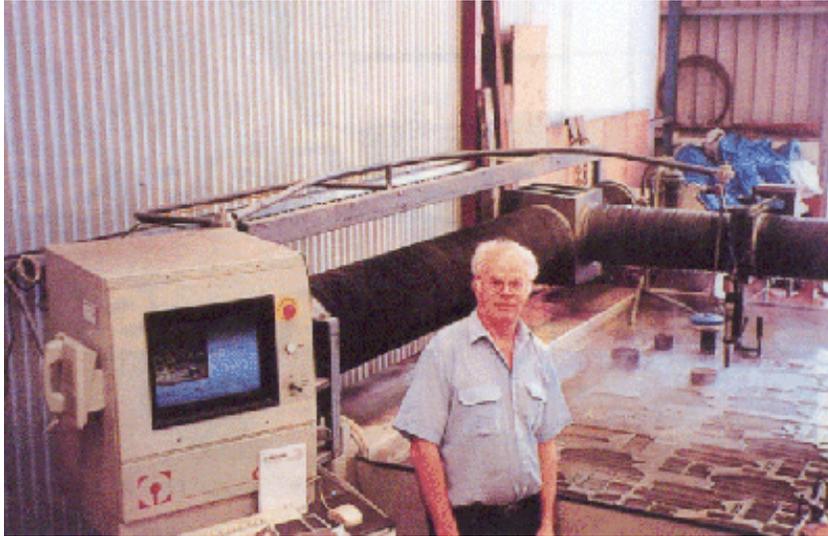


Business on the Cutting Edge

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Innovator, successful businessman and skilled, hands-on metal worker, Mark Piacun has established a manufacturing business that supplies some of the world's leading casinos with gaming machines.



Mark Piacun in his factory

Recently, he has also secured orders from customers in Australia and in Japan for large murals and floors in natural stone and marble.

His company, Blue Water Engineering (BWE), is situated on Queensland's Gold Coast and operates from two plants, at Southport and Nerang, not far from Jupiter's Casino.

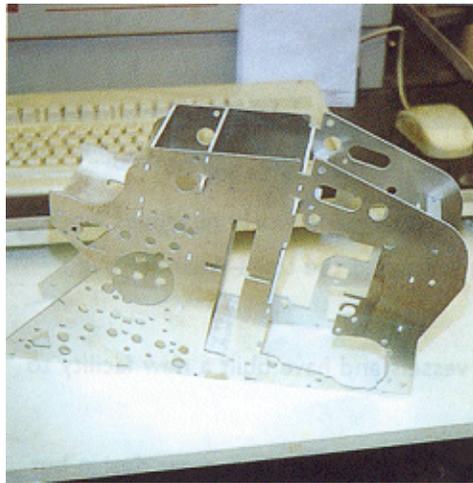
BWE's products ranging from conveying and counting machines capable of processing large quantities of coins to keno and card dispensing devices are exported to gaming establishments from Brisbane to Kuala Lumpur and on to the USA and Russia.

Piacun's latest acquisition is a second high-tech abrasive water jet cutter (AWJC), in addition to an impressive array of guillotines, presses and CNC lathes. Both AWJCs are capable of slicing through all metals, including steel and aluminum plate, copper and brass as well as stone, plastic, ceramics, composites and glass.

Highly accurate to plus or minus 0.12mm and fully pressure adjustable, the machines' cutting parameters are 1,400mm x 2,500mm x 200mm, cutting 20mm aluminum plate without leaving a telltale burring.

Eleven years ago Piacun's reputation for precision work attracted the attention of Jupiter's Casino on the Gold Coast, which required an improved version of their American-built Keno machines.

The new Keno machines built by BWE featured improved design, bearing mounts and drive systems. No less than 26 BWE Keno units are currently being used in Australian, New Zealand, Singapore and Kuala Lumpur casinos.

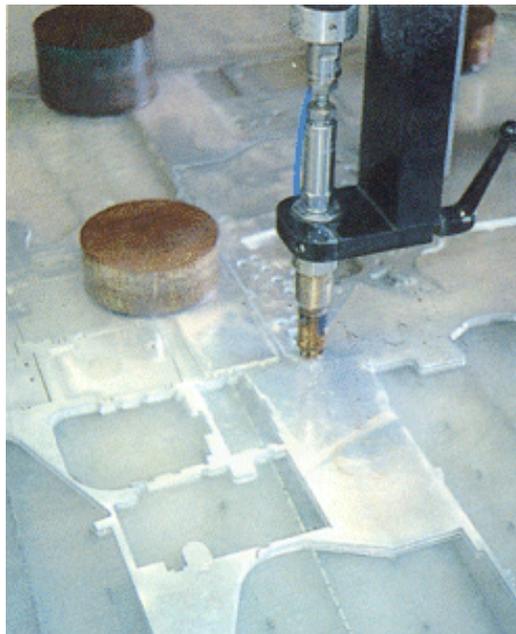


Shuffler frames from 3mm aluminium sheet.

Piacun told Manufacturers' Monthly that the close tolerances required in the machining of the various sections of the Keno and card shuffler devices, such as sensor plates and a number of small components, need a combination of AWJ cutting, CNC lathes, highly accurate wire bending and very skilled hand-work.

"Small rollers, faces, and some of the shafts are machined on the center lathes, as are the 15 stainless steel components bent to shape, between 1mm and 1.6mm thick. Some of the precision work deals with the bearings that cover the cage and how they are mounted. The deflector plates and small rings creating the ball path, all require highly accurate machining," he states.

Relying on its design expertise and modern, computer governed manufacturing equipment, BWE has also built a fully automatic card shuffling machine to replace what Piacun calls "the less sophisticated imported shoe-shaped card dispenser commonly used on casino Black-Jack tables."



Abrasive jet machining center cutting 3mm aluminum sheets stacked three high.

Featuring its own internal power supply and roughly the size of an electric toaster, it accesses international voltages from 120v to 240v, 50 to 60 cycles. Rather than conventional transformer system the automatic BWE device uses an advanced switch mode saving up to 20 per cent of Back Jack table downtime taken to reshuffle the pack by hand.

The computer chip-powered dispenser features five small motors, seven sensors and two solenoids. Capable of continuous operation and highly reliable it can dispense up to 1.5 million cards per month.

"Abrasive jet machining plays an important role in the production of the aluminum components for the card dispensing machines requiring very high accuracy in order to function smoothly and without interruption."

"In order to change the position of some components in our machine by more than 0.1 of a millimeter, machining such as AWJ cutting and CNC lathe work must necessarily be extraordinarily accurate. In the aluminum frame alone there are 270 individual penetrations of various shapes and sizes," Piacun says, adding that while the water jet cuts to a depth of four plates simultaneously, it takes up to one hour of machining to produce each frame.

Demonstrating the abrasive jet he raised the water pressure up to 310 Mpa forcing it through a small sapphire orifice at 2,700km per hour, the equivalent of about 2.5 times the speed of sound.

According to Piacun, achieving the speed and accuracy required to produce the frames, the machine pulls garnet abrasive into the high-speed stream of water which it mixes in a long ceramic tube. Moving at 1,100 kilometers per hour, the jet of water and abrasive is directed at the plate. "Because it performs at room temperature there is no molecular change in the metal being machined, as is the case with some cutting methods using various forms of heat.'

