



# Quality Control Taiwanese Style

*American tool companies have sought ways to improve the quality of their imported machines*

by Anatole Burkin

Woodworkers who pride themselves on owning nothing but American iron are becoming rare. Although it's possible to equip a shop solely with American-made woodworking tools, the choices are mostly limited to heavy-duty, industrial-grade machines or older, used machines. For light- and medium-duty tools, such as contractor's table-saws, miter saws and benchtop planers, the options are mostly limited to Taiwanese machines.

Taiwanese-made woodworking tools have occasioned lots of controversy in the past. But things are changing. Representatives from American companies that import

Taiwanese tools say modernization of manufacturing methods and quality-control measures have improved Taiwanese tools. To see for myself, I spent a week touring 16 woodworking machinery factories in and around the city of Taichung, a crowded, smog-choked metropolis of 700,000. The city is on the west coast of Taiwan, two hours south of the capital Taipei. I visited factories that make table-saws, jointers, planers, miter saws, dust collectors, motors, router bits and other woodworking tools

***Delta's presence in Taiwan is strong. A worker cleans up a 15-in. planer made at Delta's partner factory, Kosta.***



for many of the major tool companies.

I saw both old-fashioned and modern manufacturing methods. The shops I visited ranged from small operations with a handful of employees to factories with nearly 200 workers. Some plants I visited build tools exclusively for one name brand; others build machines for a dozen or more companies. Many of the well-known North American tool companies have some connection to Taiwan. Delta, DeWalt, General, Porter-Cable and Powermatic are among the many companies that maintain factories in the West and import products from Taiwan. I also visited factories that make tools for U.S. companies whose primary business is selling imported tools: Grizzly, Jet, Sunhill and Wilke (Bridgewood).

I gained some confidence that Taiwanese factories can produce good tools. To help ensure that, many American companies send their inspectors to monitor production. But I also left feeling confused by the labyrinthian network of suppliers, assembly plants and trading companies that work together, sometimes producing what look to be nearly identical tools under a variety of names. Labels can be misleading. Ultimately, the best way to judge a tool is to test it in the workshop without any preconceived notions.

### **Taiwan's low-cost labor pool attracts manufacturers**

Driving in Taiwan exercises many of the senses, especially those that register danger. Cars, scooters, bicycles and pedestrians fiercely compete for the right-of-way, seemingly oblivious to the rules of the road. Traffic lights, as a Taiwanese native explained to me, are meant "for reference only." Pileups invariably include a scooter or two, some carrying entire families. Despite the congestion and aggressive driving, the citizens avoid displaying their frustration. Horns rarely blare, and the middle finger isn't used as a rude salute. The sense of danger is also apparent in the factories, whose safety standards would shock the average OSHA inspector.

Taiwan has a labor pool of nine million. Taichung alone has 20,000 manufacturing plants that make textiles, footwear, sporting goods and machinery. The country's unemployment rate is less than 2%. Hourly employees work an average of five and a half days a week, or 44 hours. By American and European standards, the labor pool is a bargain: The average wage at a woodworking factory is about \$3.50 an hour. By contrast, factory workers at Delta's plant in Tupelo, Miss., make about \$12 an hour. It doesn't take a master's degree in business to figure out why manufacturing has gone to the Far East. Less restrictive environ-

mental laws also make Taiwan favorable for establishing iron and aluminum foundries.

The Taiwanese were building metalworking and large woodworking machinery long before they began making small woodworking machines. Shiraz Balolia, president of Grizzly, started importing metalworking tools from Taiwan in 1975. "I had milling machines and lathes in my showroom," he said. "People would sometimes ask me if I had a jointer. I didn't know what a jointer was. I had enough inquiries that I decided to take a woodworking course.

Once I learned about woodworking machines, I started ordering them," he said.

There weren't a lot of woodworking machines to import, however. To fill the void, the Taiwanese began copying Delta and Powermatic tools. "I sent a Rockwell planer to Taiwan. Within a month and a half, they shipped a prototype to me," said Balolia. "I worked with Chiu Ting. At the time, Chiu Ting was less than a backyard shed operation. I essentially put them in business," he said. Today, Chiu Ting (which also goes by the name Geetech) builds thickness planers, jointers and other machines for more than a dozen companies worldwide, including Bridgewood, DeWalt, Jet and Powermatic.

Business opportunities in Taiwan didn't go unnoticed by the competition. In the mid-1980s, Delta contracted with Rixon, primarily a drill-press manufacturing plant at the time, to produce a motorized miter

**Most major U.S. tool companies, including Delta, DeWalt, Porter-Cable and Powermatic, now import some of their machines from Taiwan.**

## ***What to ask when buying a new tool***

My workshop at home is equipped with American, Japanese and Taiwanese woodworking machines. I bought some of them before I knew enough to make a good choice. Others I carefully selected. Experience has taught me that you can't judge a tool simply by country



***Delta inspectors at work—Vibration and noise level measurements are among quality control checks performed on table saws.***

of origin. I asked a number of woodworkers and tool company representatives for some guidelines on buying tools, Taiwanese or otherwise. Here are some criteria to consider and questions to ask.

- Does the company offer a warranty for both parts and labor?
- Does the company sell parts for its tools? Even for older models?
- Does the company that makes or imports the tool service it? Are there service centers near where you live?
- Are you buying the right tool for the job? If you plan to use the tool daily, don't expect a low-cost, underpowered model to do the job.

Also, be wary of stated horsepower ratings. Amperage is a better guide to a motor's potential power. And if the motor is approved by Underwriters Laboratories, chances are the stated amperage is accurate.

Talk to people who use tools. Visit a cabinet shop or woodworker and ask for advice. Or talk to someone at a repair shop. —A.B.



**Safety standards are different.** Workers at many Taiwanese factories, including this painter at Kosta, aren't required to wear respirators.

saw. Nevin Craig, president of Delta, is blunt when he describes his experience with Rexion, which has become one of the largest woodworking machinery manufacturing companies in Taiwan. "We showed them (Rexion) how to make miter boxes," he said. "They have no knowledge of woodworking. It's foreign to them. They don't conceptualize what the market demands from woodworking."

To get the kind of product they wanted,



Delta invested heavily in two Taiwanese companies, Kosta and Joinery. Delta expanded and remodeled those plants, employing many of the manufacturing techniques used at the company's Tupelo, Miss., plant, which still produces the heavier, industrial woodworking tools as well as parts for some Taiwanese tools.

Much of what comes out of Taiwan is first designed in the United States. Ryobi's B-3000 tablesaw is assembled at Rexion, but engineers at the Japanese-owned company's American division in South Carolina designed it. Rexion officials tout their research and design department's capabilities, but when I walked through the company's showroom in Taichung, most of the tools on display looked like tools that were originally developed in North America, Europe or Japan.

### Manpower vs. machine power

Taiwanese tool factories have a large proportion of employees doing manual labor. At a similar plant in the United States, many of the hands-on tasks would be done by machines. Automation has, however, found its way into many Taiwanese factories, especially when it comes to machining metal parts to precise tolerances.

Computer numerically controlled (CNC) machines are commonly found at factories machining router bits, miter saw parts,



**Two ways to balance a wheel—**A worker at the Grizzly factory (above) uses a modern electronic tool to balance a bandsaw wheel. The woman (left) at the Shih Hsin factory uses a mechanical method to perform the same task. Both workers use a drill press to remove small amounts of material when one section of the wheel is heavier.

jointer beds, tablesaw tops and other critical components of woodworking machines. A CNC machine, which can cost tens of thousands of dollars, is programmed by an operator, then goes about its business cutting and grinding parts. These machines move parts into position and shape them from a variety of angles with multiple cutterheads. Extreme precision and consistency is possible. Twenty years ago in Taiwan, many of these milling operations were done manually, a method more prone to human error.

Modern metal-casting plants exist, too. At Shiny Pioneer Diecasting, a computer controls the vats of molten aluminum that

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—Clifford P. Rickmers,  
Jet vice president of operations

shuttle overhead between huge injection molding machines. Every 10 seconds, another Delta miter saw part is pulled out of a mold and dropped into a crate to cool. Although I didn't visit iron casting plants, I was told many of them have upgraded to automated systems that produce castings that are more consistent, and hence stronger, than manually poured ones.

At the plants I visited, I didn't see any automated sheet-metal welding machines or laser-cutting tools or modern powder-coat painting systems, which are common at U.S. factories. Kosta, Delta's biggest Taiwanese partner factory, employs 180. Most employees work along conveyor-powered assembly lines using pneumatic tools to assemble tablesaws, compound miter saws and other tools. Kosta is an atypical Taiwanese tool company because it builds products for only one company, Delta.

Shih Hsin assembles tablesaws, bandsaws and dust collectors for Jet and other companies. The assembly line looks similar to Kosta's. Shih Hsin, which also goes by the name OAV (it's an acronym for the company's maxim: obligation, aggression,



**Taiwanese factories may produce similar tools under different brand names.** On this day, two lines of dust collectors were moving down the assembly line at Shih Hsin (also known as OAV). The blue one is a Jet.

validity), is growing rapidly. In 1996, Shih Hsin moved into its current plant on the outskirts of Taichung. Its payroll of 90 is expected to grow to 130. Safety standards here, as at most Taiwanese plants, seem lax by U.S. standards. Few workers wear eye, ear or respiratory protection. Ironically, at Shih Hsin someone had gone to great lengths to protect employees from a lesser threat: bugs. Outside, on a fence separating a farm field from the factory, hundreds of clear plastic bags filled with water had been strung up. I was told these homemade water balloons reflect the sun's glare, which repels flies. It works.

At Grizzly's partner factory, expansion

was also under way. The company currently has 100 employees. James Chen, co-owner of the plant, said he expects to hire 60 more workers in the next year. While I was there, carpenters were installing rosewood veneer panels and hardwood trim in Chen's new office. The workers were using Japanese handplanes to remove milling marks from cut molding. Their workbench doubled as a tablesaw. It was a simple plywood box held together with hinges and clasps. Underneath, an inverted circular saw had been attached to the top. A separate section of the box's top was free to move, like a sliding carriage. The carpenters were offered the use of a tablesaw, but

they declined, saying they were more comfortable using their own tools. Although their saw seemed crude, their workmanship was anything but.

Tool manufacturing in Taiwan is a cooperative process. Large plants such as Kosta, Shih Hsin and Grizzly assemble tools, but many parts are made elsewhere. No one really seems to know, but a good estimate is that several hundred businesses are devoted to making, machining and assembling woodworking tools in and around Taichung. A typical machine may contain parts from a dozen or more suppliers. Parts that look alike may actually be made by different vendors. Often these parts are not labeled, so it's impossible to track down where they came from.

### Monitoring product quality

Tool company representatives say it's important to monitor Taiwanese subcontractors and assembly plants. Delta found the best way to ensure impartial inspections is to hire its own team, independent of the factories. Inspectors spend a lot of time on the road, visiting subcontractors and assembly plants. Delta's Taiwan office employs 28, which includes design engineers. Bridgewood, Grizzly, Jet and Powermatic officials said they, too, have employees in Taiwan, or send people there, to monitor the quality of their products. I was shown stacks of parts that had been rejected by inspectors at several of the factories I visited.

Lucas Chang, director of Delta's Taiwanese office, explained what it takes to get consistently good products from Taiwanese factories. "Shop owners know what's required for a product," he said. "It's a matter of how you watch over them. Taiwanese businessmen are smart; they know how to make a little extra. They will build the product right as long as you *make* them build the product right."

Tool company representatives strike a common chord when explaining what it takes to get well-made machines from Taiwan. In a word, it's vigilance. "The attitude in Taiwan has been that quality is the responsibility of the purchaser," said Clifford P. Rickmers, Jet vice president of operations. "But I'm working to change that." Powermatic President George Delaney agrees. "You have to stay on top of it, or they (Taiwanese tool companies) will disappoint you." □

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## China: The new Taiwan

In the highly competitive woodworking tool market, manufacturers are constantly looking for ways to keep prices attractive to consumers. One way to reduce the cost of making a tool by 10% to 20% is to build it in the People's Republic of China where raw materials and labor cost less than in Taiwan. In 1996, China exported about \$24 million worth of woodworking machines to the United States, about 11% of Taiwan's total.

Many small bench grinders and drill presses, made by Delta and other companies, are made in China. Many makes of cordless drills and batteries, including those sold by Ryobi, are also being made in China. —A.B.