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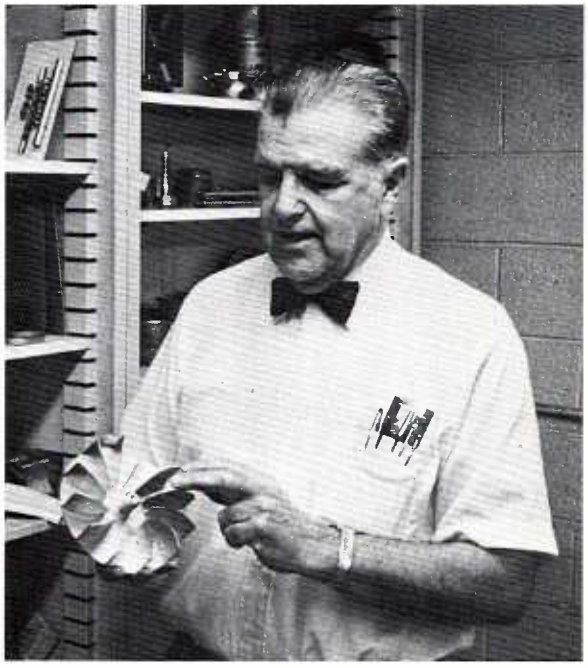
by RICHARD CREAL



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A nickel-based alloy started a brazing battle - and won!

Bob Peaslee's mission at Wall Colmonoy Corporation 34 years ago was simple but demanding: go out and sell something nobody wants.

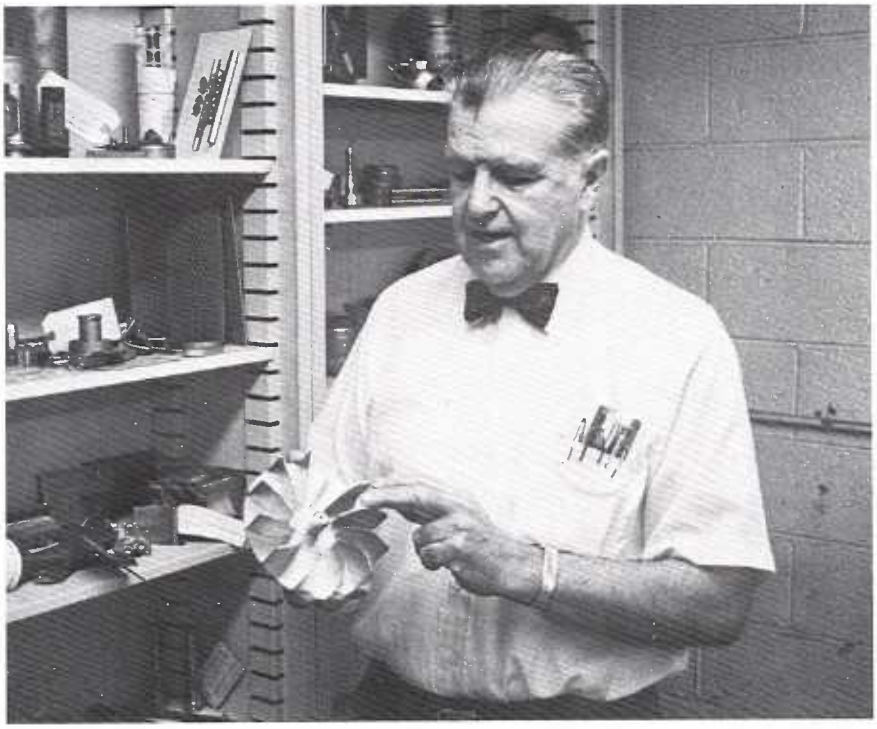
by RICHARD CREAL

The year was 1950. A young metallurgist from the East named Robert L. Peaslee came to Detroit and approached A. F. Wall, president of Wall Colmonoy Corp., with what was then a radical idea: the manufacturing and marketing of a nickel-based alloy as a filler metal for the brazing of stainless steels.

Peaslee already knew the concept worked. For several years he had been using a particular composition of nickel, chromium, boron and silicon to braze the stainless steel parts of aircraft engines at Curtiss-Wright Corporation in Woodridge, N.J., and the results had been impressive. The remelt temperature of the nickel-based filler was 2500°F, compared with 1760°F for the silver manganese alloy commonly used at the time. This was a significant advantage in that the filler would not melt away if the engine overheated by 200°F or so.

But when Curtiss-Wright chose to exit the aircraft engine business in 1949, Peaslee decided to look for a company that would have more use for this method. Wall Colmonoy seemed a likely prospect because then, as now, the company's specialty was "making metals work harder" through the development and application of a variety of alloys (many of them nickel-based) to protect metal equipment from abrasion, corrosion, high heat and other wear-inducing factors.

In addition, the company was already doing some brazing for its customers. But that was copper brazing of carbon steels, an established procedure. Nickel-based alloy brazing of stainless steel was a new frontier. Still, Mr. Wall was sufficiently impressed with Peaslee's idea to give the young man a shot.



Peaslee discusses samples of brazing tasks Wall Colmonoy has been presented with over the years. Specialty work, rather than high volume, has become the firm's stock in trade.

Peaslee soon found out that getting the job was the easy part. In the months that followed, he collided head-on with a highly skeptical market that had not heard of his success with the filler at Curtiss-Wright. Just about everybody subscribed to the conventional wisdom of the day that nickel-based materials were metallurgically unsound for brazing applications.

"Everyone thought these materials would ruin anything you put them on," Peaslee recalls. "My big job was to go out and sell something nobody wanted."

Peaslee, who is now Wall Colmonoy's vice president of manufacturing, obviously did something

Alloy

right. Today, after nearly 34 years, Wall Colmonoy not only sells large quantities of the original alloy (now called Nicrobraz 125) but about 20 other standard compositions as well. And if none of these work for a particular task, the company will develop an alloy that will. Wall Colmonoy has also cultivated a receptive market for its accessory materials for brazing (brazing aids) which include blasting grit, cement, flux, and stop-off.

Goods and services

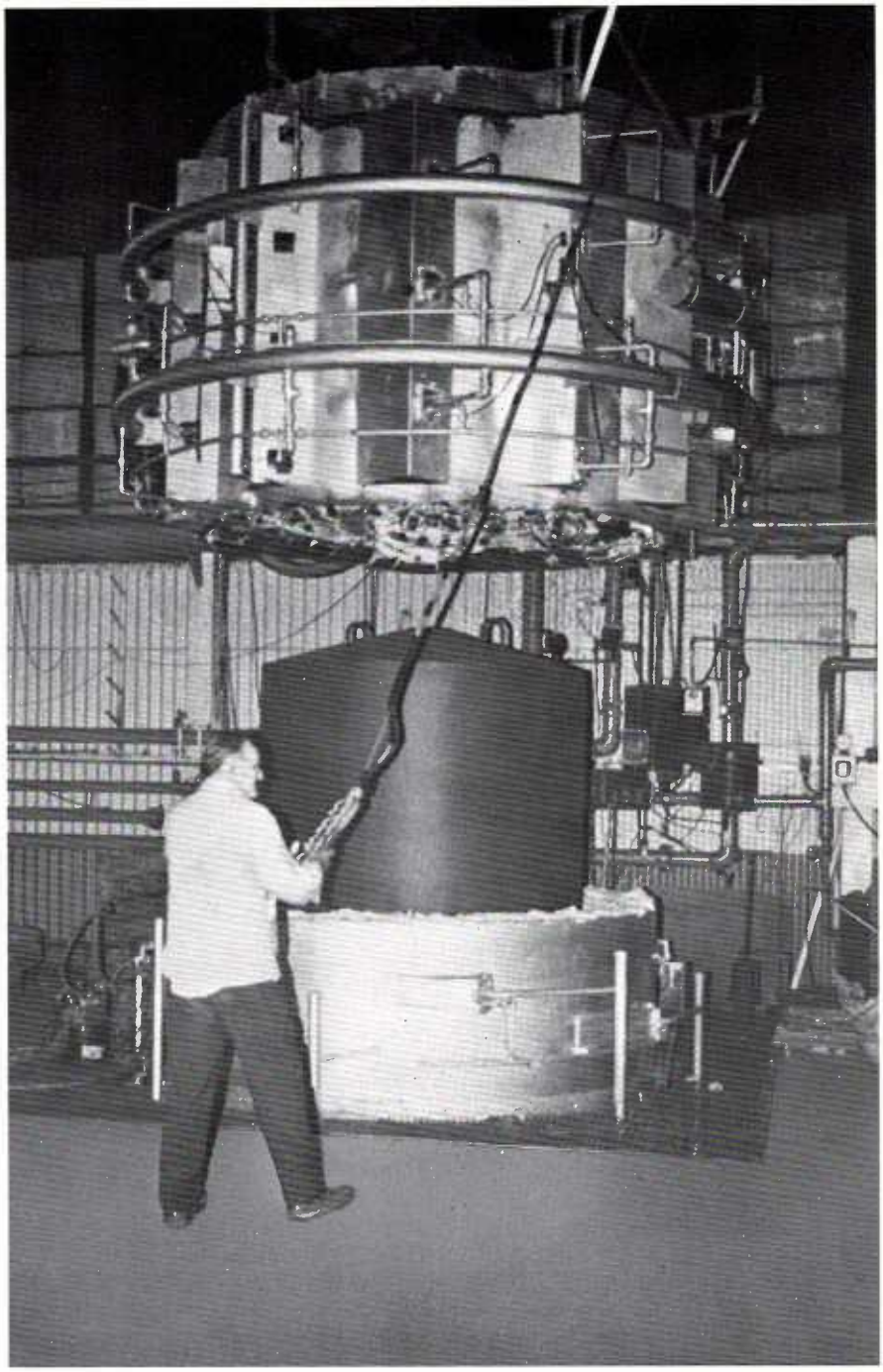
An even greater revenue-producer than the sale of brazing goods is the provision of brazing services on a contract basis. The company has six plants in the United States—Detroit, Los Angeles, San Antonio, Oklahoma City, Philadelphia, and Dayton, Ohio—one in Montreal, and one in Pontardawe, England. These shops, which also do hard surfacing and metallizing, boast extensive brazing facilities characterized by a flexibility that will accommodate quite an array of unusual, difficult, and/or oversized brazing jobs.

Today, Wall Colmonoy's brazing goods and services are used in the production of jet engines, missiles, spacecraft, nuclear reactors, and chemical, food and dairy process equipment.

But winning this kind of acceptance was an uphill battle.

"When I was starting out, I could make a thousand good brazes for a customer, but all I needed was one failure and they'd throw me out of the place," Peaslee says.

To overcome such resistance, Peaslee had to do a lot more explaining, documenting, demonstrating and proving than most salesmen, and consequently he had to incorporate many areas of endeavor into his marketing strategy. He (and other Wall Colmonoy staffers) wound up getting involved in furnace design, contract brazing, research and development, and a wide variety of educational activities. The message was constant: brazing in general, and brazing with nickel-based fillers in particular, were viable processes for high strength industrial applications.



Huge furnaces built by Wall Colmonoy enable them to perform oversized brazing jobs. The pit furnace above (in Detroit) has a work zone 72 inches in diameter by 15 feet high.

"All the weird things"

Still, potential customers were slow to come around. Wall Colmonoy had to prove its brazing expertise by accepting on a contract basis jobs that were unusual and difficult, things that customers could not or would not do themselves. But this development turned out to be a blessing, because as the firm successfully solved one off-beat problem after another for perplexed manufacturers, it developed a reputation as an expert on the unusual.

"We took on all the things people

didn't want to do or were having so much trouble with, they were willing to try anything," Peaslee says. "We did brazing of titanium, zirconium and beryllium—all the weird things. It got to the point where if someone had a tough job, a lot of people would point him in our direction, and then we would develop the brazing process that would do the work."

Thus it soon became apparent that Wall Colmonoy's brazing destiny lay not in high volume, but in specialty work. To accommodate it, the company designed and built just about all of its own furnaces over the years, and in the process became adept enough to enter the market as a furnace manufacturer for a thirteen-year period (1967-1979).

One of the company's first creations was a brazing furnace that would hold a pure dry hydrogen protective atmosphere and had a working zone 72 inches in diameter by 80 inches high.

"The furnace manufacturers said it wouldn't be possible to keep a dry hydrogen atmosphere in that large a container," Peaslee says. "So we did it."

Since then, that furnace's height has been increased to 15 feet, and it still uses a pure dry hydrogen atmosphere.

In 1953, the company started building vacuum brazing furnaces, and some of them are quite large. The vacuum furnace in Dayton, one of the largest in the world, can take workloads up to 120 inches in diameter by 60 inches high, weighing up 20,000 pounds. Another vacuum furnace in the Detroit plant has a work zone 100 inches in diameter by 90 inches high.

These furnaces, which are also used for special heat treating projects (a typical example being the stress relieving of a seven-ton compressor section following welding and straightening), are particularly good for very large parts that are too bulky or heavy for the customer's own furnaces.

If necessary, Wall Colmonoy will modify its furnaces to accomplish a specific brazing task. Working zone heights, for example, have been extended to 15 feet and temperature capabilities have been raised to 3000°F. The customer ends up paying a higher price for such modifications, but normally he still finds it a lot more economical than buying, installing, and operating his own furnace.

One of the most unusual brazing jobs Wall Colmonoy performs is the repair and renovation of jet aircraft parts, both military and civilian, that are regularly sent to the plants in Oklahoma City, San Antonio, Los Angeles and Montreal. There, the cracks in burned and worn parts are filled in with one of the Nicrobraz alloys. The company says the regenerated parts end up giving a performance equal to or better than new parts at a cost of as little as 7% of that of new parts. The Oklahoma City plant goes beyond brazing repair to the point of actually manufacturing mufflers for light aircraft.

Brazing Engineering Center

Determining what needs to be done in difficult cases is often the job of the company's Brazing Engineering Center, which was established at the Detroit complex in 1969 to conduct research and development projects and provide consulting and training. With a modern laboratory and an exhaustive library of brazing data, the center's personnel have come up with product innovations and improvements and have solved specific brazing problems for customers involving design, equipment, procedures and failure analysis.

"There aren't too many people who know how to interpret the failures of brazed joints," says Peaslee. "One auto company was making heat exchangers and the brazed joints on every one failed. They couldn't figure it out so they gave the failure analysis work to us, and now they're making good pieces all the time."

A big part of Peaslee's marketing program over the years has been education. Since 1970, the Brazing Engineering Center has been conducting three-day intensive courses in brazing during which students bring in specific problems that are addressed in class.

Peaslee himself periodically teaches brazing classes for the American Society for Metals in Metals Park, Ohio, and also contributes to the American Welding Society's Brazing Manual.

Launching conferences

In 1970, as chairman of the American Welding Society's Committee on Brazing and Soldering, he was instrumental in launching the first International Brazing Conference held in conjunction with the AWS annual meeting. Those conferences have continued on an annual basis ever since, and have stimulated an effective interchange of ideas.

Currently, Peaslee is working to establish local chapters of the Committee on Brazing and Soldering to hold regional conferences to supplement the national meetings.

Inevitably, the spreading of information through courses and conferences has stimulated competition for Wall Colmonoy. Indeed, personnel from competing firms often attend Wall Colmonoy's three-day classes. But Peaslee believes the advantage of enlarging the demand for brazing and brazing products more than offsets the disadvantage of increased competition.

"Instead of trying to hide things, I've gone in just the opposite direction," says Peaslee. "I believe that expanding the market will give us a better chance for growth than holding everything in one hand and not letting anybody see what's going on. We're very free with information."

One of Peaslee's pet causes at the moment is the introduction of more brazing courses in the metallurgy curricula of various schools and colleges. "One of the things that's held brazing up over the years is that designers and engineers have been coming out of college for many years having been taught that brazing is not a viable process for joining metals," he says.

All of these activities are aimed at getting the appropriate people to use brazing or at least consider it an option. But do people still need convincing? Even nowadays?

"Even nowadays," Peaslee confirms with a sigh. "But it's getting easier because we can point to many successes." **HT**