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Appliance Manufacturer

The Magazine of D

Industry Backs Bush On CFCs

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When Redesigning S T R E T C H

Reaching for the unknown gets your creative juices flowing to plot technology breakthroughs.

JOE JANCSURAK
Senior Editor

Munro & Associates is in the business of making clients nervous.

The Troy, Mich., consulting firm aids companies involved in redesign projects. And if there's one thing Sandy Munro, president, has learned it's that the most successful projects often result in raised blood-pressure levels.

"When you get people feeling that they're treading in areas they're not familiar with, that's when you're on the edge of creativity," says Munro. "I try to pull people towards stretch redesigns because it's important for companies to push technology to the limit."

An example might be a redesign calling for gas-assisted injection molding. While this is a process many companies have little experience with, it allows for the forming of difficult shapes and molded-in features that could reduce parts count.

Another aspect of redesign that makes participants nervous is setting goals.

"What you really need to have is unattainable goals," says Munro. "The problem is everyone wants achievable goals so objectives are typically set low."

Compressor cuts

When Ingersoll-Rand's Portable Compressor Division, Mocksville, N.C., began a redesign effort for a portable compressor, its goals were a 30 percent to 40 percent parts-count reduction and improvement in concept-to-market time.

It achieved that and more, says Tom Short, vice president, Munro & Associates.

Thirty-four Ingersoll-Rand personnel representing design, manufacturing and marketing were trained in Boothroyd-Dewhurst DFM techniques. The group was divided into five teams with representatives from each discipline.

Parts were analyzed, fasteners eliminated and processes evaluated. The results speak for themselves: the number of parts was slashed by 64 percent, assembly operations were cut by 75 percent, assembly time dropped from 18.5 min to 6.5 min., and concept-to-market time went from two years to 12 months.

Medical is ripe

Virtually every segment of the appliance industry practices DFM with the possible exception of medical-appliance manufacturers, says Dan McCarthy, vice president, Munro & Associates.

"There has been little thought given to DFM issues. There's great potential when you begin analyzing parts and processes in devices such as respirators and blood-testing equipment."

It may be a matter of injection molding a part rather than machining it for $30 or $40, says McCarthy. Or it may be simple matter of eliminating unnecessary parts.

"It is often thought that by adding more parts, you have a more robust design. But every part you add increases cost and is a potential quality problem."

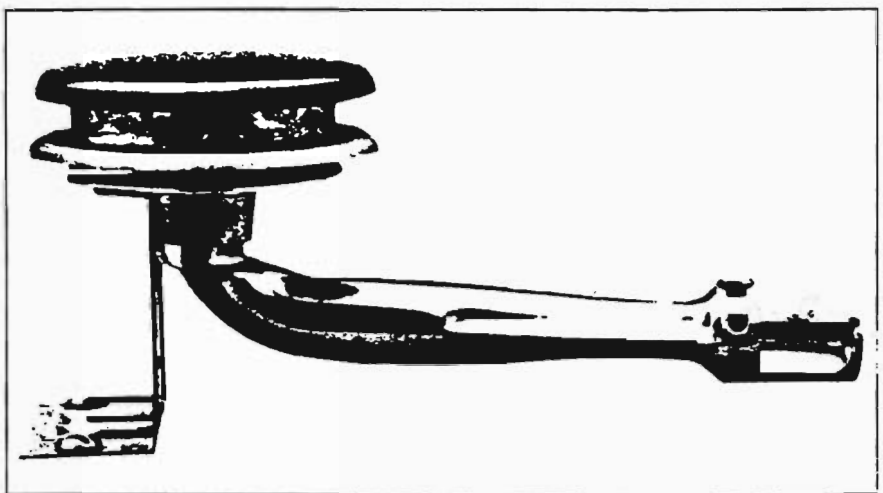
Evolutionary not revolutionary

While some redesigns call for "a good stretch," others are a matter of product refinement.

For the Xerox 2515 engineering copier, it was a matter of improving the earlier 2510 model.

Xerox engineering copiers make full-size copies up to 36 in. wide. It copies from diazo blueline prints, sepia, original drawings, computer-aided design plots, cut-and tape composites and other xerographic copies and rigid originals up to 1/8-in. thick.

"Our objective with the 2515 was to take the 2510 and develop a more advanced product with as little redesign as possible,"



***Second-generation sealed burner** by Caloric features a longer Venturi tube for better gas/air mixing and fewer connections.*

says David Donahue, chief engineer for the Rochester, N.Y., firm.

Improvements were a closed-loop toner control system that automatically monitors and maintains toner concentration and an on-demand oil system that supplies oil to the fuser roll on demand, which eliminates excessive buildup and transfer of oil to copies.

The developer housing was redesigned to accommodate a sensor that was added to monitor toner levels. A microprocessor establishes proper levels. And if the toner falls below a certain level, toner is dispensed until the proper level is reached.

The on-demand oil system employs a small diameter donor roll that rides on the fuser roll. When the fuser roll needs oil, friction between the fuser and donor roll increases until the donor roll begins rotating, picking up oil from a nearby oil-saturated "wick pad."

The donor roll's oil is transferred to the fuser roll, which decreases the friction between it and the donor roll until the donor roll stops.

The 2515 is one more example of Xerox's commitment to problem-solving, says Donahue. "What we're doing isn't rocket science. It is, however, part of the quality-improvement process here."

Mixing it up

A redesigned Caloric sealed burner provides better ignition and ease of assembly.

The redesign provides a longer Venturi tube in which gas and primary air have more time to mix. Gas enters the Venturi tube while surrounding primary air from the plenum chamber is sucked in. The design requires just four connections and none of the various gas-line connections required with other designs.

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>
> —Sandy Munro, president, Munro & Associates

"With previous burner designs we were running a gas tube from the valve to the burner (gas and air would mix just underneath the burner), says Chuck Mueller, manager, cooking products planning, Amana Refrigeration, Inc., Amana, Iowa.

"In each case we had nuts that had to be tightened in order to attach the gas line to the burner as well as the gas line to the valve. That called for eight more connections and eight more places to conduct leak tests."

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