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Cutting Impossible Materials Made Possible

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New Clamshell Concepts Make Impossible Possible

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Resurgence. Renewal. Rebirth. Call it what you will, the clamshell press is being rediscovered as new technology and improved methodology make the impossible possible. Printers, converters and finishers worldwide are taking note of the venerable clamshell's capabilities, bringing exciting new possibilities to those of us in the diecutting industry.

Why the renewed interest in the clamshell? What's changed? And how does the clamshell's resurgence impact our industry?

Short run solution

Developing markets, new substrates and unique applications are fueling interest in the clamshell as printers and finishers reinvent themselves by expanding or specializing. To increase production, plants are looking for ways to affordably speed up workflow and still maintain quality. With its fast set-up times, accuracy and versatility, the clamshell is being rediscovered as the most cost-effective solution for short to medium runs.

Clamshells cut a wide variety of materials, from styrene to corrugated board to gasket material

C+C Packaging, formerly C&C Bindery, of Long Island, NY, USA reinvented itself from a traditional bindery to a specialist in pharmaceutical and cosmetics packaging. With its business growing, C+C purchased a 28" by 41" (711 by 1041 mm) clamshell to handle and attract more short-run business.

"We didn't realize the high volume of digital short runs we were doing on our automated press," said C+C President Mitch Holsborg. "So for us, the true benefit of the clamshell is relieving pressure on longer runs. Its quick makeready and accuracy fills our need for a smooth workflow."

Stretching the possibilities

Highly versatile and compact, modern clamshells from My Press Needs (MPN) and traditional clamshells such as Brausse, Standard and Thomson range in size from 26" to 120" (660 to 3048 mm). For short to medium runs, the clamshell's ability to cut very thin or thick materials to precise tolerances in registration makes it superior to other technologies. The clamshell can kisscut, diecut, score and crease, as well as emboss or hot stamp a variety of materials:

- Corrugated and board—singleface/singlewall; doublewall; triplewall; and flutes A, B, C, E and F
- Plastic corrugated cut and sealed
- Foam—open cell/closed cell
- Plastics—styrene, polycarbonate, polypropylene, PETG, PVC and more
- PLUS: Structural board

Diecutting the impossible

Until recently, it was widely thought that structural board, used for the growing POP display and signage market, was impossible to diecut.

But one clamshell company has turned the impossible into the possible. MPN has successfully tested and diecut 5/8" (16 mm) structural board like Falconboard® and Re-Board® with an edge quality similar to tables. This technology enables its clamshell to go from a normal 0.937" (24 mm) steel rule die to a 3" (76 mm) steel rule within seconds, with no filler plates added or removed. With a lab-tested production differential of 17:1 clamshell diecutting vs. table cutting, the potential impact on the large format market will be revolutionary, bringing "mass production" capabilities.

The impact on diemakers will be equally exciting, with the opportunity to produce the 2" (51 mm) and 3" (76 mm) cutting dies for the developing large format market and eventually in specialty markets like foam, three-dimensional parts and more.

Profitable alternative

As demand for large consumer POP displays continues to grow, so will demand for the clamshell. Plants are turning to the clamshell because it's faster to set up, produces more finished pieces per hour and is more affordable than automated presses and plotters. With its smaller footprint and average speed of 800 to 1,000 sheets/hour vs. a table's 300 sheets, the clamshell is a profitable alternative.

M&M Inc. General Manager Chris Mace Jr. said the clamshell has helped reduce his plant's makeready times. Specializing in large format screen process and digital printing for POP displays and retail signage, M&M, based in Philadelphia, PA, USA, uses a 40" by 56" (1016 by 1422 mm) clamshell to diecut dense materials and sheets up to 56" by 40" (1422 by 1016 mm).

"As a result," said Mace, "we can increase production rates and cut down on waste from setup. With a simple spin of a dial we can fine tune our press to 0.0001 of an inch (0.00254 mm). If the material is improperly loaded, the operator can easily disengage before the sheet is damaged."

The operator's immediate access to the clamshell and the entire work area makes operating the press simple and fast. This open dwell feature is one of the clamshell's main keys to its versatility, according to Rick Putch, Director of Business Development and Consulting for Dicar Inc. and an IADD director.

"The open dwell gives you the flexibility to position the material and still have a steady flow of product," said Putch.

An operator feeds a 40" by 56" (1016 by 1422 mm) clamshell

A 40" by 56" (1016 by 1422 mm) clamshell

Crest and Thompson clamshells

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"Manual feeding compensates for material static and warp—something auto feed can't do," he added. "The open dwell is a great improvement in clamshell safety and flexibility."

Advances in safety have made today's clamshell safer than ever. All new clamshells are required to have standard safety devices that quickly and safely stop press action, including safety relay circuitry that creates redundancy in the safety circuit and keyed switches and sensors to comply with ANSI standards. Large presses, starting with 28" by 41" (711 by 1041 mm), must have at least one scanner; while the large format models, such as the 63" by 123" (1600 by 3124 mm) jumbo clamshell, have three laser scanners, which scan the moving platen area and prevent press action if the operator is in the hazard area.

Next generation

As the clamshell continues to evolve, what does the future hold? Developing technology offers exciting possibilities.

Currently, heated platens (for heating the die/tool) are used to cut plastics because heat improves the edge quality. One new technology being tested is a thin-heater for the clamshell's moving platen.

In order to heat both the male and female die, one clamshell company is developing presses with two heaters, one for the traditional head mounted/non-moving platen and one for the moving platen. Two key applications will benefit from this technology: Diecutting expanded PVC such as Sintra, especially on large format presses; and embossing membrane switch and graphic overlays (polyester and polycarbonate) on smaller clamshells.

Redefining diecutting

Another new development in the very early stages is poised to revolutionize diecutting. The "soft cut system" will replace the traditional metal cutting plate with a non-traditional polymer plate and serrated cutting tool. This new soft cut has tremendous market potential, providing the same edge quality as a rotary diecutter with greater efficiency and reduced tooling costs.

In-plant testing of the soft cut system will take place within the next 60 to 90 days. Using its 40" by 56" (1016 by 1422 mm) clamshell, M&M will experiment with diecutting 0.090" (0.229 mm) styrene cold without heat to see if the edge quality can be improved over the traditional method.

M&M's Mace said, "Currently many diecutters using difficult substrates, such as 0.090" (0.229 mm) styrene, will diecut the material and then spend countless hours sanding the parts before they can be shipped to the customer. The idea is that the soft cut system with new tooling will eliminate this costly and timely step."

If the soft cut system proves successful, it will revolutionize the way substrates are diecut. Printers and finishers will enhance quality and production performance, opening new opportunities for expansion. Diemakers, diecutters and suppliers will benefit as well by offering new tooling and education.

Anticipating the need for continuing education, Dicar and MPN opened a research and development lab last fall at Dicar's facilities in Wexford, PA, USA. The lab currently houses a Pedersen 16-ton (14.5 tonnes) Swing Arm Clicker press for testing honeycomb, dense rubber and foams; and MPN's 23" by 32" (584 by 813 mm) Crest Clamshell for testing the soft cut system and diecutting new substrates. Putch said the R&D lab will serve as an educational facility for the industry, offering development and training in new diecutting techniques.

As clamshell developers stretch the possibilities, the diecutting industry will continue to evolve. New tooling, cutting dies and substrates; advanced technology and methodology; unique applications; and even entirely new markets are on the horizon. Advances in clamshell technology give us all the opportunity to partner with our customers in moving the diecutting industry to the next level.

Rob Weidhaas, Jr. is the founder and president of My Press Needs LLC. He has 25 years' experience in the converting industry with an emphasis on clamshell press technology, and established MPN in 2000 as a diecutting resource to the print finishing, packaging and general converting industries. Today the company specializes in the development, engineering and sales of clamshell presses worldwide. Weidhaas is an active member of IADD, FSEA, SGIA, GPI, AICC and serves as an observing committee member for the ANSI B65 safety standard for stand-alone platen presses. For more information on MPN, visit www.mypressneeds.com.