It's not just speed that counts

How to go beyond efficiency and optimise the die-cutting application to create premium flexible packaging using laser technology

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One of Comexi's main cornerstones and differentiating factors is its global vision throughout the flexible packaging printing and conversion process. Its in-depth market knowledge and experience gained over 60 years in developing printing, laminating, and slitting technologies and other peripheral equipment have given a competitive advantage to the companies that look to including innovative solutions in their applications.

An often-asked question is "What are the speed improvements when using an online laser die-cutting system rather than conventional mechanical die-cutting equipment".

Before replying, it is essential to highlight that the laser system has several advantages over the mechanical system, which include its simple design, faster performance since it uses software (and not elements like dies) and obviously less wear. In a few words, the laser system is gaining greater importance in the significant time-to-market race. This means that there is already a time savings even before cutting starts.

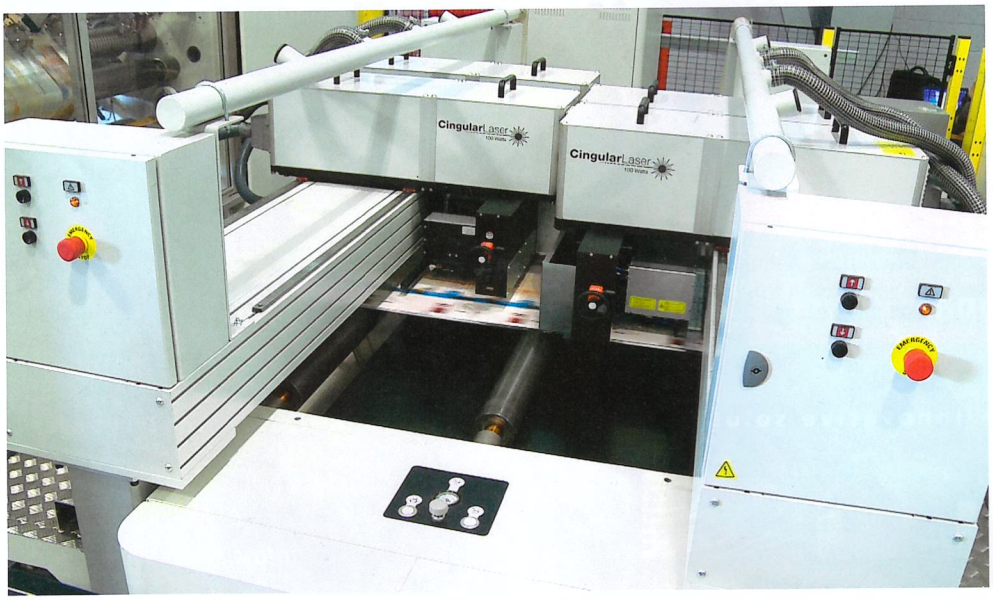
In addition to the advantages of reducing stock and preparation time, the die-cutting speed can also be improved. However, depending on the webs used, it would be necessary to investigate the level of investment needed to beat the mechanical speed and compare the payback of each system.

It is also worth remembering that repeatability and quality are far superior when using the laser, meaning less claims and product defects.

From efficiency to optimization

But what happens if we want to go further? And what would happen if we could improve the performance of the flexible packaging while also optimizing the process?

The key here is in imagining the enormous possibilities of a solution within a global, sustainable process. The response comes from the broad market knowledge and the synergies built up between different Comexi product lines.



The Comexi Proslit Cingular Laser online laser processing system

The question, "At what speed can I die cut online using a laser system?" then becomes "How can I optimize the die-cutting applications and create a design with solventless premium packaging?"

Let's consider a successful case in food packaging. Thanks to the laser die-cutting process, it is possible to improve a top range stand-up pouch that has a window for viewing the contents. It is normal to find packages on the market meant for storage in the refrigerator, made of between 40 and 80 g/m^2 of paper, printed and laminated with 40-50 micron polyethylene (PE) and a PE and polyamide triplex web.

There are many ways to manufacture these kinds of packages. The most common way is to print the web using flexography or rotogravure technology, transfer it to a laminating machine with an unwinder that has a mechanical die cutter to make the window online which then is immediately fed into a press using a WetFlex system or an alternative. Once the paper is die cut, it becomes weaker and might break. This laborious process requires a large investment in machinery, since the converter requires a specialized laminating machine for this type of product. In addition a large range of dies are needed to modify the shape of the windows according to requirements, and we must not forget the time spent manufacturing dies to do the tests, through to when the client validates the product and production finally begins. Therefore, doing away with laminating and adding die-cutting reduces production time.

Another typical system is to use the laminating machine in solventless mode. A paper substrate is used and, just before starting production, the window is removed and the product laminated, just as in the previous case, but without the window. In this system, it is not clear how the product will behave because of problems removing the window with the glue attached, as this could cause problems when removing the web, wasting the glue which, in the end, we remove. This incurs additional cost by including an extra application in the actual

laminating process and possible problems with the solventless glue on the window, which could cause a final blockage in the process. In addition to making it harder to rewind the web in a simple laminating machine, the difference in thickness created by not having the window also affects rewinding. In short, this process reduces the production speed and consequently the productivity rate in the laminating machine.

Finally, the most effective system is online extrusion laminating. In this case, the investment is extraordinarily high and requires large-scale production volumes to ensure good system payback.

From a traditional system to a laser system

The Comexi Proslit product line specialises in slitting and rewinding. Comexi analysed the situation and considered how this process could be improved. The company believes it has provided an ideal solution, which can revolutionize the finishing market for flexible packaging. The star element is the Comexi Proslit Cingular Laser online laser processing system, an optional feature which can be built into the slitter rewinder machine. This technology is being adopted more and more by converters all over the world because of its multiple functions built into one single piece of slitting equipment.

Following the discussion, manufacturers are aware that a product with the above-mentioned characteristics can be converted without using solvents, therefore improving the quality of the packaging. This means that printing on a paper substrate can be achieved using a water-based flexographic printing press (i.e. Comexi Flexo F2 WB), or using offset printing with EB (for instance, the Comexi Offset CI8). Subsequently it is laminated with a water-based tape onto paper with a flexo or roto carriage in register format, as we know that this type of tape is more economical and simpler to apply than a WB on film.

Once the web has been laminated, the product is prepared in a slitting machine that already has the Comexi Proslit Cingular Laser system installed. This technology will process the window with the desired shape on the paper without touching the PE or internal film, and it will remove the paper using an extraction system that works on the Venturi principle.

It can do this all without the use of dies by designing the required shape with the design software built into the laser system, which means that the desired shape can be adjusted exactly to the required distance from the edge of the product and laminated in register. This would mean a significant improvement by adjusting the edge where the glue is for the purpose of registering.

The heat absorption capacity of the paper is higher than that of the film, which means that it is possible to work with far less power so as not to damage the internal film. It is worth highlighting that the paper is not touched at any time during this entire process until it is laminated, and so the web is not weakened or handled without the film cover. This facilitates the rewinding process because there are no thickness differences.

This same product can be made with solvent-based laminating, without the converter investing in a specific laminating machine for the specialized packaging. The converter only needs a standard laminating machine with a flexo or roto carriage capable of working in register format (like the Comexi Nexus Dual or the Comexi Nexus ML1).

Processing premium packages can be done in several way,s the most effective being online extrusion laminating

Application built into one laser system

By adding the laser system, converters don't just improve the die-cutting process. The same system can also perform easy open longitudinal WB, transversal CD, alphanumerical numeration, micro and macro perforation, etc., all with full tension control.

We can see the horizon in the distance – the enormous possibilities converters have at their disposal for optimizing their products. On this horizon, laser systems are in the early stages considering the enormous potential for developing new applications in the flexible packaging conversion industry. Comexi Group continues to explore this technology so it can offer added value, which means overall added value in each and every one of the flexible packaging printing and conversion processes.

The Comexi Proslit Cingular Laser online laser processing system is an optional feature that can be built into the slitter rewinder machine