



Less waste, more benefits

Not only consumers produce waste, but also production and packaging processes. Cavanna apply ultrasounds to its packaging systems to reduce waste in areas of bread, pasta, cakes, chocolate, frozen foods and medicines.



The flow pack, the bag for monodose products, an icon of convenience, hygiene and safety for millions of units of daily consumption in diverse sectors (food, medicines, cosmetics and non-food products), can be improved when regarding the environment. How? Not only by reducing the amount of film around the product, but also by studying a different system for the sealing of edges of film that actually wrap the product. The machines that produce the flow pack (flow packer) present an important critical point: the sealing procedure. In most cases, today it is achieved through wrapping film

adapted to create edges which may be welded with jaws that work with pressure and heat. This technology ensures a perfect grip and high speed for a wide range of films, monolayer and laminate, but generates two different types of waste: not only does this use more plastic film than is really necessary, but creates product and film waste, this occurs when the roll of the film that feeds the machine finishes. The flow of products stops working with this operation but the jaws of the welder remain at the same temperature. These not only consume unused thermal energy but also heats the products nearby. When

TESTS ON PACKAGING MATERIALS

Ref.	TYPE	FILM DESCRIPTION	THICKNESS µm	SPEED ⁽¹⁾ m/min	APPLICATION FIELD	SEALING PERFORMANCE
1	1mono	OPP COEX METALIZED	30	60	Bakery & Confectionery	●
2	1mono	OPP COEX	28-30	60-80	Bakery & Confectionery	●
3	1mono	CLEAR OPP LTS COATED	30	60	Bakery & Confectionery	●
4	1mono	WHITE OPP LTS COATED	40	60	Bakery & Confectionery	●
5	laminated 2 film	OPP/VMCPP (CAST)	45	40	Bakery (mostly used in Asia)	●
6	laminated 2 film	OPP/COEX METALIZED	45	40	Bakery	●
7	laminated 2 film	NYLON/PE	80	40	Cheese	●
8	laminated 2 film	NATURFLEX/MATER BI ⁽²⁾	50	20	Various Food	●
9	laminated 3 film	PET/ALU/PE	80	20	Pharma	●
10	laminated 3 film		130	10	For Microwaves	●

The system Flowsonic by Cavanna permits to obtain welds identical to that realized with traditional systems.

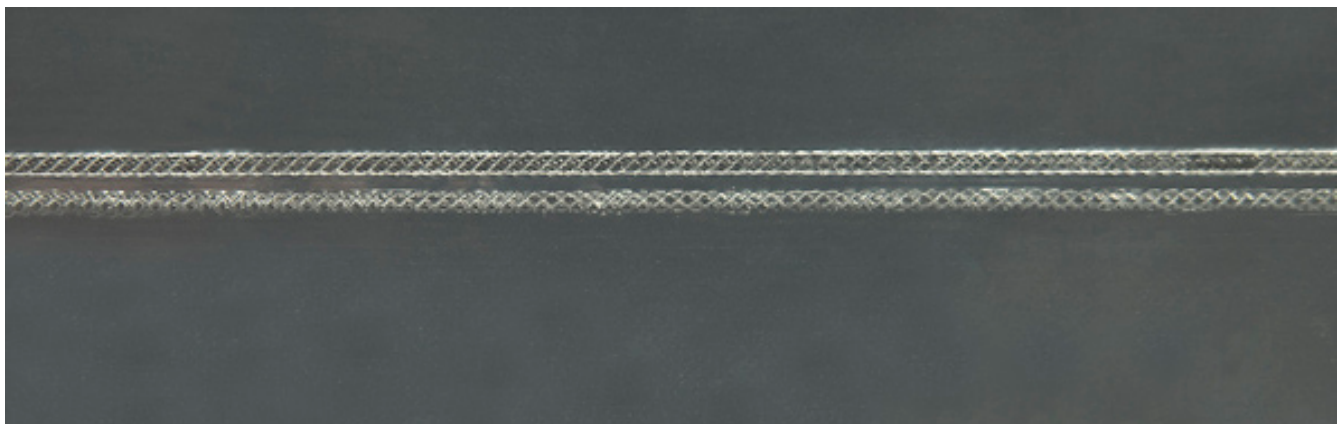
(¹) Tested speeds (maximum speeds not necessary)

(²) Biodegradable from renewable sources

● excellent ● good

starting up once more, products found in the welding area are discarded. In addition to changing the roll, you may come across interruptions in the upriver upstream packaging process. There may also be required downtime machines for the presence of irregularly shaped products that may interrupt the flow. Finally, there are many products very sensitive to the heat of the jaws, for example, food containing or covered with chocolate, frozen foods and pharmaceutical products that do not tolerate high temperatures. Also problems with demoulding (a device for automatic baking in the production process of many bakery products and also in the confectionery industry) may create downtime machines and therefore waste. In particular regarding the packaging of products containing chocolate, biscuits and snacks the maximum rate of waste tolerated on a standard work shift does not exceed 0.5% but may reach even 1% for downtime machines related to the previous stages of packaging. Cavanna, an Italian company specialized in systems of packaging flow packs, has studied for 5 years different solutions to the problems that are

integral and integrated. Integral, in the sense that it could be set up on most models of flow packers, even those not recent, integrated in the sense that it could give just one response to the diverse causes that generate waste in a packaging line. The solution is found by welding longitudinally, as is usual in flow pack packaging, using the ultrasound technique. The heating of the edges of the film can be obtained through a mechanical vibration, and not thermal, of the molecules that make up the film of the packaging. The heart of the system is called sonotrode, a device that converts electrical energy into mechanical energy, and that is applied to the edges of the film in the form of mechanical micro-pulses, then a second device compresses the heated edges, the plastic melts and there we have the welding. The difficulty of developing this technique consists in adapting to the needs of the flow packer: the seal must be perfect, on all the main types of film used and in the future also on bio-based plastic film, the speed must be equal to or greater than that of lines where the welding is heated. The system must be applicable to different models of machines,



Ultrasound welding is “cold”: therefore avoiding the thermal stress of the products, and in all cases of downtime machines, they are not discarded when restarting the line. In addition, ultrasound can be made with forms, shapes and graphics with which, for example, could all play or be part of the elements of a brand.



both new and recent. In addition, the weld must be identical to the traditional one and must not create any doubts regarding the hygiene security of the packaging to the consumer. Finally the consumer must be able to open up the packaging by following the usual sequence of manipulation known for this type of packaging. Regarding the use along the line, the administration of an ultrasound system must not be complex for operators of plants. Energy consumption must be equal or less and the advantages should compensate for the cost of the system. Moreover, the energy applied to the weld should be determined with extreme precision to avoid any damage to the film or product. Cavanna has developed a solution that can actually integrate different goals and problems: the system Flowsonic (Longitudinal Ultrasonic Welding) permits to obtain on nearly all plastic films normally used on these packaging (even the new biopolymers), welds identical to that realized with traditional systems, but without spreading heat in the area where welding takes place: therefore avoiding the thermal stress of the products, and in all cases of downtime machines,

they are not discarded when restarting the line. In addition, the technology “cold” requires less energy consumption and in the future could give the possibility of reducing the amount of film today used to wrap products. As for speed, you can arrive up to 100 meters per minute, equivalent to parts 300/400 depending on the type of film used. Other advantages of the system are the reduction of maintenance costs (heating elements and manifolds are replaced by the ultrasound system) and the absence of noise (the device works well over the limit of 20,000 Hz, limit audible by the human ear). However something new and particularly interesting regarding technology elaborated by Cavanna is the shape of the welds obtained with ultrasound: in addition to being realized at a high speed and precision, they can be made with forms, shapes and graphics with which, for example, could all play or be part of the elements of a brand. At this point, the ultrasonic welding could become an ally of marketing, counterfeiting and a higher level of security at competitive prices.