RETORT FLEXIBLE PACKAGING:

The Revolution Has Begun

Already big in Asia and Europe, retort flexible packaging is poised to penetrate deep into lucrative North American markets still dominated by metal cans and glass bottles. *by Andrew Mykytiuk, Editor-in-Chief*

Cover art courtesy of Rohm and Haas

COVERSTORY

Retort systems use steam or superheated water to cook food in its own package, extending shelf life and ensuring food safety. Retort flexible packaging is not new. In fact, it has been around since the late 1960s when the US Army began looking to replace its unpopular canned C-rations. That project led directly to Meal Ready to Eat (MRE) packaging, which the Army uses to this day. Since then, retort packaging has evolved from a mostly aluminum foil structure to a sophisticated multilayer, high barrier laminate package.

The military, like most entrenched bureaucracies, is resistant to change. But there was virtually no resistance to the rapid adoption of the MRE. Why? Because food packaged in the retort pouch tastes much better than canned rations.

It tastes better

Food packaged in a conventional can must be cooked approximately twice as long as food contained in a retort pouch. To sterilize the food contained in either form of packaging, it must be brought up to approximately 245° F and kept there for a specified period of time.

"Retort packages have a thin profile and a high ratio of surface area to volume," says Dr. Rani Stern, chief technical officer, CLP Packaging Solutions. "Heat penetrates the food much more quickly when it only has to reach the inside of a half-inch-thick mass rather than a much larger mass in a round can."

Dean Hoss, president of flexible packaging converter Pyramid Group, says the product nearer the can wall is overcooked. "Retort time is reduced 30% to 50% and by as much as 57% in a flexible pouch. You don't overcook and soften the food into mush. If it's packaged in retort flexible packaging, no matter what it is, it tastes better, and the consumer absolutely loves that," explains Hoss.

In addition to better taste, the product looks better. One of the most common compliments heard from focus groups during consumer testing of retort-packaged tuna was that its texture and appearance was superior to a hockey-puck-shaped chunk of canned tuna. "Not only does it look better, but it offers better nutrition, too, because of the reduced cooking time," adds Gary Bell, president and CEO of Kapak Corp.

Today's retort offers the latest in consumer-requested features such as perforation and press-to-close zippers.

Yes, but is it strong?

Strength of the pouch has always been an issue. Most people associate metal cans with strength and can't believe plastic can be as strong as steel—even people in the packaging industry.

"I had one client take a #10 pouch and throw it across the factory floor to see if the seal would hold," says Hoss. "Another drove one wheel of a forklift up onto the corner of a filled pouch. The next day he backed the forklift off the pouch, checked it, took out a marker and wrote on it 'Passed the forklift test.' I still have that pouch in my office."

Bell says that barrier and strength are two of the most critical aspects of a retort pouch and both have been mastered.

"For more than 20 years, Kapak has produced flexible retort packaging in various pouch configurations and laminations, including foil and clear structures. We have solved all challenges regarding this package such as pouch integrity, product compatibility, and durability," asserts Bell.

Another consideration, perhaps the key consideration, is the strength of the seal. Retort packaging is provided to the packager as a preformed ready-to-fill-pouch. The packager fills the pouch and then seals the package before it's retorted. Once again, this issue has been addressed and has been successfully dealt with.

"The critical seal is the one made at the top of the pouch after filling. The films used on the inner sealing layer were developed specifically to survive the rigors of the retort chamber. "Today's filling equipment can not only seal, but also perform preheating, and inject steam into the headspace. If you wish, they can draw a vacuum or inject nitrogen to minimize the amount of air in the pouch and ultimately increase

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Food contained in a retort pouch tastes better. Consumers prefer the taste, texture, and nutritional benefits of foods packaged in flexible packaging.

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shelf life," explains Dennis Calamusa, president of Allied Flex Technologies. He says that the heated seal bar is one of the impediments to faster line speeds and predicts that ultrasonic sealing will be a major advance in high-speed pouch filling.

"Retort technology has been developed and perfected for high-speed commercial application," says Mike Greeley, Totani product manager at Amplas. "And so have all of the related components such as ink, adhesives, and film." Greeley says that even though the retort concept was developed in the US at the behest of the government, there were no commercial applications. "The Japanese took the retort concept and ran with it. They have spent the past 20 years perfecting this technology. In the US, just a few foods are sold in retort pouches. In Japan, you'd be amazed at what the consumer can get in a retort pouch and in a wide variety of sizes and shapes."

Shelf appeal

The tin can only offers one look, a cylinder of varying heights and diameters. The retort pouch, on the other hand, offers marketers a virtually unlimited pallet of possibilities. Everybody in the packaging business knows that more than the consumer makes 70% of all purchase decisions in the store as they scan products on the shelf. For this reason it's obvious that a compelling presentation is critical.

"I have much more gloss, and I can print a very high graphic image that shows my product. I can't do that with a can. And because of the curve, a can's label offers very little in terms of facing on a shelf. With a standup pouch, I can put a beautiful, eye-catching, attention-grabbing image on the side that faces the consumer during that critical buy-decision moment. On the back panel I can put nutritional information, a recipe, a picture of the finished cooked product, and a barcode," says Hoss.

In terms of consumer appeal and product differentiation, there is no comparison between a pouch and a can.

"Once again, a can is a can, but when the customer asks for a retort pouch they have a lot to choose from. We can provide our customers with a flat three-side seal pouch, a standing pouch, or a standing pouch with a bottom gusset and a hanger hole. We now offer a quad-pack style pouch. It has four print panels, two side gussets and a front and a back. And we offer a clear retort pouch as well," explains Hoss. "Add to this the latest in easy-open and reclosability features and you can clearly see why consumers in Asia and Europe love the retort pouch."

The retort pouch gives the consumer more. The back of this tuna package is loaded with information, including a recipe.

Pouch Vs. Can Advantages

FEATURES	BENEFITS
Reduced cooking time	Improved taste/nutritional value, faster cycle time
No sharp edges	Eliminates cuts and promotes employee safety
Takes up less space	Increased utilization of warehouse/storage space
Package differentiation	Increased sales
Environmentally friendly	Source/energy reduction
Weighs less	Reduced transportation costs
Larger package facing	Better shelf appeal
Rotogravure printing	Improved graphics capabilities
Package durability	No dented cans
Complete product evacuation	Improved yield
Conforms to all FDA guidelines	Market ready

Source: Kapak Corp.

Cans: A logistical nightmare

Consider for a moment the logistics of truckload after truckload of empty cans pulling up to a loading dock.

"This is not a one shot deal either; this is day in and day out," explains Calamusa. "Now, multiply that over the course of a month, a year, five years, and it's amazing what we have learned to adapt to and accept as normal. Shipping empty cans from point A to point B and then warehousing them until needed is sheer lunacy. Consider the cost of the warehousing space. What about the cost

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to fuel those trucks and pay the drivers? What money are we making off of that as opposed to bringing in a single truckload of pouches. We take this huge can-based infrastructure for granted. It's no longer a matter of comparing the cost of a can versus pouch. You have to look at the total cost of the entire process including the logistical aspects."

Hoss says that he can load 28 pallets of pre-decorated ready-to-fill retort pouches into a 40-foot trailer. "That's probably the equivalent of 25 trailers filled with cans. Wouldn't you rather have one semi pull up to your plant instead of 25?"

Calamusa wonders why a glass bottle or a metal can makes perfect sense as a pre-made, yet we frown on the concept of a pre-made pouch? "It's ridiculous, yet when it comes to the debate between cans and flexible this is what we get hung up on, instead of realistically looking at the total benefit of the package as it relates to the entire infrastructure," says Calamusa.

What's the holdup?

According to Hoss, retort offers other advantages such as storage space savings as high as 96% over can, a product that is safer and easier to open than a can, and the fact that flexible film uses up to 75% less energy than cans to produce.

If retort is so beneficial, then why has it taken so long to gain mainstream acceptance here in the US? There are several reasons. The first is that retort packaging has been tried before. Bell says that about 15 years ago there were companies that tried it, but the quality of the lamination was poor.

"When you start having product failure, the programs get dismissed immediately," says Bell. "Those companies that tried to lead the way wound up with a black eye."

Another reason is the high cost of the downstream infrastructure. "Packagers need to invest in two important pieces of equipment: a filling machine that is all stainless steel and the retort chamber," says Bell. He also says that there is one more missing component, and that's the knowledge and experience to actually do it. But for converters looking to get into retort there is plenty of help available.

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"Rohm and Haas may not have been supplying these technologies in North America, but guess what? The retort pouches that are coming in from overseas, we're supplying our adhesive there. We're familiar with the technology, we know what it's going to take to make it work, and we're more than willing to partner to anyone who's interested in it," says Bill Magee, market manager for packaging and converting adhesives at Rohm and Haas.

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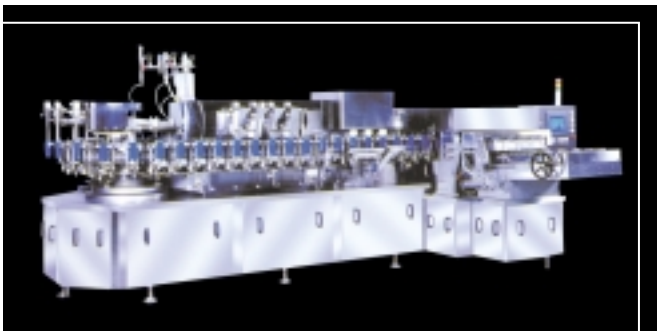

This Toyo Jidoki filling machine can open, fill, and seal 250 pre-made retort pouches per minute.

Perhaps the greatest impediment to the wholesale and rapid adoption of retort packaging in North America is the well established can-making and can-filling infrastructure.

Jeff Hopp, product manager at Curwood Inc., a Bemis Company, is involved in developing retort packaging and knows all about its benefits. He says that the main impediment to retort's growth is the efficiency of existing can lines.

"There is a lot of capital invested in can lines, and they run extremely fast. The efficiencies have been driven so far to the positive side that it would be difficult to justify replacing that output with a pouch machine. These huge companies have all of these can lines that have already been paid for one hundred times over. It's easy to understand their reluctance to recapitalize and go with retort. But what we are seeing is line extension. At some point in the future we expect dedicated can fillers to offer their products in retort, but it will be a long, drawn out process. It will happen, but it won't happen overnight."

Converters lead the way

Pioneering converters such as Pyramid and Kapak have been working with retort pouches since the late 1970s. Companies such as these realized that they had to take the leadership role because, except for the MREs, the market just wasn't growing by itself in North America.

"When we started talking to major food companies years ago, the cost of the packaging itself and slow line speeds were stumbling blocks for us," explains Hoss. "We realized that if we were going to take and sell retort pouches in the US we really had to take the lead and help our clients get into retort.

"We looked at all of the food categories we felt should be into retort pouches either now or in the immediate future. We then developed material specifications for those pouches, from 85 grams all the way up to three-kilo size," Hoss continues. "We formed alliances with machinery companies in Europe and Asia to help them develop high-speed lines for pouches. We formed partnerships with companies that make the retort chambers and systems. We did all of this so we could go to any client and have all the answers."

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Once almost completely aluminum foil structures, today's retort films are sophisticated, ultra-high barrier laminates.

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Now five years later the price of the packaging is, according to Hoss, comparable to cans and, in many cases, costs less. And during that same time, pouch filling speeds have doubled.

Only the beginning

In Asia and Europe consumers are treated to many familiar products available in retort. Here in the US most retortable flexible packaging is used to ship large-sized pouches to restaurants and institutions. Consumer applications, for now, are limited, but growing quickly.

"We see it as a hot, fast-growing market," says Magee. "Soups and stews are beginning to show up in standup pouches. Who would have thought that soup would come in anything but a can. I think it's a tremendous growth opportunity for North American converters who haven't been involved in this market to a great degree."

To many converters the StarKist tuna package was a wake up call and is indicative of what the future is going to bring. Currently, Kapak has R&D deals with more than 20 North American converters.

"One of these clients is a major pharmaceutical company. They are planning to make millions of retort pouches with a custom spout," says Bell. "I can't tell you more because of confidentiality agreements but it will be an ultra high-barrier, four-layer lamination, totally transparent with bold graphics. This client went out and spent millions to bring the equipment in and build the appropriate setting. They are totally committed to retort pouching. The product will be launched on Jan. 1, 2003. And this is just the first product of what they feel will be many. I believe

that it will revolutionize the pharmaceutical medical packaging business."

Opportunity knocks

Campbell Soup produces nearly seven billion cans of soup every year. If flexible packaging converters were able to capture just a fraction of that market it would go a long way in solidifying the retort beachhead in North America.

"Tin cans, I believe, are on the endangered species list. I further believe that in the next three to five years you won't be able to find cans in supermarkets, club stores, and convenience stores in particular," asserts Dean Hoss. " In the past 12 months we have seen more interest in retort than in the previous 20 years combined. No single converter can take care of the incredible volumes that we're going to see, and we're going to see it soon. In the potato chip bag converting industry there are many converters serving that market. Likewise, we are going to need many converters for retort because the upside potential of this business is huge."

Magee says that most of the retort pouches sold to US consumers are being converted and shipped in from overseas, and there is no reason for it. "Converters here have the capability to do this. They have access to the same converting technology, and I think they're going to step up," says Magee. "They have to, the opportunity is just too great."

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