# 1963 NATIONAL PLASTICS CONFERENCE

Sheraton-Chicago Hotel
Chicago, Illinois
November 19-20-21

THE SOCIETY OF THE PLASTICS INDUSTRY, INC.

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Preliminary copy of a report to be presented at the SPI Annual National Plastics Conference at the Sheraton-Chicago Hotel, Chicago, Illinois. (In the case of representatives of government agencies and educational institutions, the paper reflects the author's views only.)
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## PLASTICS PACKAGING: TODAY AND TOMORROW

by

Lloyd Stouffer*

Back in 1956 when I spoke to an SPI conference in New York I pursued a theme which brought some rather startling reactions. I was quoted, in one sentence, in a newsletter, as saying that "the future of plastics is in the trash can."

I had to do a little explaining to my boss, who happens also to be the publisher of *Modern Plastics* magazine.

What I had said in the talk was that it was time for the plastics industry to stop thinking about "reuse" packages and concentrate on *single* use. For the package that is used once and thrown away, like a tin can or a paper carton, represents not a one-shot market for a few thousand units, but an everyday recurring market measured by the *billions* of units. Your future in packaging, I said, does indeed lie in the trash can.

It is a measure of your progress in packaging in the last seven years that this remark will no longer raise any eyebrows. You are filling the trash cans, the rubbish dumps and the incinerators with literally billions of plastics bottles, plastics jugs, plastics tubes, blisters and skin packs, plastics bags and films and sheet packages--and now, even plastics cans.

The happy day has arrived when nobody any longer considers the plasticss package too good to throw away.

How did you get here? By steadily lowering materials prices while steadily improving materials and methods so that plastics can at last take their place in packaging as a utilitarian material--in many cases now the best material for a given job at the lowest cost. You can now in some cases beat out such standbys as glass, metal and--yes, even paper--on a strictly dollars-and-cents basis.

And with plastics prices still moving downward, while the other materials are pushing steadily upward--the future can only be rosy.

**Today:** More than one out of every eight pounds of plastics produced goes into packaging -- a total of a billion pounds last year, probably 200 or 300 million more this year. Dollarwise, you got close to 6% of the $13 billion spent last year for containers and materials. This year plastics bottles alone will probably go over 2½ billion units.

**Tomorrow?** The trend to plastics is accelerating so fast that predictions are difficult. One authority suggests that your market in packaging will double in the next two years. Another, highly cautious, sees it as tripling by 1970. At any rate, it is safe to say that packaging will soon be the second biggest consumer of plastics -- second only to the building industry.

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So much is happening today -- and so much more is in prospect for tomorrow -- that I can only cite briefly some of the highlights as we see them.

Enormous new markets for plastics are opening up with new concepts in the drawing and forming of sheet materials--going far beyond the earlier thermoformed blister, important as that is, into whole containers.

The brilliant star on the U. S. scene is the Philip Morris polystyrene pack for its new Paxton and Saratoga cigarettes--a truly significant event, because this is no experiment, but a $10-million bet by this very smart packaging company that a plastics package will be cheaper than paper. Whole new packaging lines are required. At least two other cigarette companies are setting up for it, and three European companies stand ready to produce the equipment. Need I point out that 25 billion cigarette packages are consumed in this country yearly, and if all of them were to go the Paxton type of package this alone would take 390 million pounds of polystyrene.

There has been great interest over here -- but little action as yet -- on a lightweight bottle thermoformed from PVC sheet, which has made considerable headway in France and Italy. I am told that 35% of all the edible oils consumed on the Continent are now in throwaway plastics bottles of one type or another - a revolutionary change for Europeans who are accustomed to getting this product in heavy, returnable glass bottles.

Perhaps of more immediate significance here is the breakthrough in Europe on blow-molding of PVC bottles. Two large companies in England are now using these bottles for noncarbonated beverages and other food products. One system is particularly interesting because it uses pre-extruded cold parisons which can be simply shipped to the packaging plant as lengths of tubing and formed there into bottles in an in-plant blow-mold machine. This boosts molding speed and cuts costs. PVC, as you know, is basically an inexpensive plastic, can be rigid, can be quite transparent, and can be formulated so that it is perfectly suited to food products - an area in which blow-molded plastics in this country have made comparatively little headway.

Of course, we are now seeing high-density polyethylene bottles in the larger sizes getting into a few food products here - notably milk - and we are told that a transparent polyethylene bottle is on the way, although we haven't seen one commercially as yet. Gallon sizes of high-density polyethylene milk jugs are now reported in use by three dairies, carrying a premium of two cents over plastic-coated paper. The same thing in polypropylene, now being tested, may cost no more than paper.

Otherwise, the march of HD polyethylene bottles - from washing detergents, to bleaches, to heavy-duty cleaning

detergents – is so prominent and so well known that I don't think it's necessary for me to comment. I might just show the latest move - four (?) leading brands of heavy-duty detergents, that previously used only glass, now within recent weeks in plastics bottles.

The lowest in cost of all rigid packages is the fibre can - the standard for more than 70 years for household cleansing powders. But right now we find the two leading brands of cleansers (Comet and Ajax) coming out in blow-molded polyethylene canisters with spin-welded shaker lids. The resin is a special "bleach" grade. The spin-weld closing, incidentally, after normal high-speed filling, can now be done at 300 a minute.

Dutch Cleanser started things in the powdered cleanser market with its three-piece yellow container thermoformed from high-impact polystyrene sheet, with the two halves of the body sealed in the middle by spin-welding. They have also lately used a blow-molded polyethylene container which is identical in color and appearance; you couldn't tell them apart. The latest word is that they are now using both types, and will continue to use both types.

And now we have Bowlene, a toilet cleanser - difficult to package - in this very attractive blow-molded container.

Perhaps one of the really significant trends of this year will prove to be the extension of blow-molding from bottles to cans and canister shapes. A large national foods packer is preparing to introduce, for a dry, free-flowing product, a blown, square-shaped, polyethylene can with a screw-type lid. And Shell Oil Co. has market-tested in this country a blown, one-piece HD polyethylene body for quart cans of motor oil, which in Europe has proven to be competitive with the foil-fibre can. Motor oil, I might point out, requires 2 billion cans a year.

Here are examples of four-color process printing on polyethylene bottles.

This is also the year in which we have seen blow-molded HD polyethylene bottles - and some polystyrene bottles - moving in to replace a considerable amount of glass in the ethical drug field. I think this is particularly significant because this is a case in which plastics are pushing out glass because of lower cost and no other reason. These bottles duplicate in size and shape the familiar blakes and Boston rounds long used for prescription drugs. Many come in amber color. They have no squeeze function; they have no factor of sales appeal. They simply cost less, I am told, when shipping weight and breakage are taken into consideration.

To give you an idea of the size of this pharmaceutical market, it has been absorbing 3.1 billion glass bottles per year, with a value of $60 million. Plastics in 1962 were estimated to have had 150 to 175 million bottles in this field, and forecasts are that this figure will rise to 800 million by 1967.

This is the year in which plastics have moved into the beer and beverage field in a big way. The hottest thing right now in a six-pack for cans of beer is the die-cut sheet of low-density polyethylene, with a handle, which just slips over and grips the six can tops. The reason why Budweiser, Ballantine and others have shifted to this from paperboard is simple enough; it costs 1 cent less per six-pack. Coming along are three other types of clip-type plastics six-packs, injection molded from polystyrene and polypropylene and one polypropylene sheet design – each of which has various advantages, including low-cost and high-speed application.

This is another case in which plastics are posing a serious threat, on a cost basis, to a simple paper package. Since there are 9 billion cans of beer produced annually, one authority has estimated the potential can-carrier market for plastics at 25 million pounds.

And then there are the bottled beers and beverages. Plastics' new applications here come in both large and small sizes. On the one hand, there is a big swing away from the old wooden cases for returnable bottles to lightweight, durable plastic cases, injection-molded, usually, of high-density polyethylene.

**Modern Plastics** estimates the volume here at 8 million lbs. of polyolefin resins this year, with a potential of 50 million lbs. by 1968.

On the other hand, plastics -- usually vinyl -- are beginning to replace cork as liners in crown caps. Small, you say? Small in size but big in volume. Plastics have already displaced nearly 5,000 tons of cork in this application. There will be 50 billion crown caps used this year, and 15% of these will have plastics liners. The remaining 28,000 tons of cork is a fair target.

This, too, may seem like a small item, but there is the prospect of real tonnage (as well as a better consumer reputation for plastics) in recent improvements in snap-fit, thermoformed container lids so that they really fit and don't pop out when you handle the package. This market is already estimated at about 1 billion units a year. I have in mind not only the snap-in lids for tub-style packages of plastics or paper, but also the growing trend among top brands of coffee away from the key-opening can and toward the simple can-opener can which comes with a polyethylene over-cap for snug reclosure. It cuts package costs by 10% and the consumer like it. The potential on ground coffee alone is 1 billion cans per year.

We are beginning to see a few packages of molded polypropylene, taking advantage of the self-hinging property of this plastic. The most significant, because it offers big volume, is the blow-molded, hinged "can" for J & J Band Aids, which simulates its previous white-enameled metal can. This package demonstrates the excellent results with heat-transfer labeling on polypropylene.

Looking at another area – there's the prospect of a real breakthrough into big-volume use of heavy-duty film shipping bags, because of improved polyethylene resins and primarily because of improved sealing techniques. (Here again, paper is taking it on the nose.) It is estimated that there will be 10 to 12 million plastics shipping bags used this year, and that there will be 500 million a year by 1965, consuming 100 million pounds of resin.

In the film area also we find a wealth of new developments right now to speed up and perfect the handling of shrink films on the packaging line. With the machines now available for thin-line seals, there is the possibility that carton overwrapping may move away from the old, cumbersome tuck-and-fold method to a shrink wrap that will fit like a second skin, with no lap-folds. At last count, there were nine types of shrink film available, and which among these will come out on top is anybody's guess.

The takeover of plastics coatings on paperboard continues unabated, but still has plenty of ground to cover. According to the latest figures, 80 million pounds of polyethylene will be used to coat milk-carton board this year – but only 1½ million pounds will be applied to frozen-food cartons, where the next big growth should come. One supplier predicts that frozen-food volume - marking a trend to linerless, wrapperless cartons - will be over 20 million pounds by 1965.

Of course, the expectations for paper milk cartons may be upset if a practical, low-cost all-plastics milk package comes along - particularly one that is economical in pint and quart sizes. It is interesting to note what is happening in France, where with no previous throwaway milk package - nothing but returnable bottles - they are turning to a very thin-walled, almost flexible, blown polyethylene throwaway container. It

is a curious thing; almost a cross between a bottle and a sack. When filled, however, it will stand upright.

I might point out one reason why we are finding so many interesting developments in throwaway plastics packaging in Europe. The European countries are moving in one step from a tradition of returnable containers to throwaways. They are simply leapfrogging the intermediate stages in which we now find ourselves trapped, in many product areas, because of our heavy investment in machinery – as, for example, the machinery for paper milk packaging.

No industry is more heavily weighted with conventional packaging machinery than the cigarette industry. That is why it is refreshing – and highly significant to you, as plastics people - to find a company like Philip Morris willing to face the prospect of outmoding millions of dollars worth of existing machinery if the plastics package proves to be really better. If the move succeeds, it will be a salutary example.

In this quick review, I have by no means covered all of the new developments in plastics which look important to packaging.

I have said nothing about the polycarbonates, which offer interesting new possibilities in both film and blown bottles. I have said nothing about the nylons, although we see them coming in films, laminations and coatings for demanding protective applications. I have said little about molded closures, although we are aware of the big swing to thermoplastics and the growing evidence that polypropylene makes an effective linerless closure. I have said little about blister and skin packs; about plastic foams, about formed sheet trays of polystyrene, or about polystyrene film - all of which are big and growing.

But I have tried to point out the product directions in which the newer things are moving. And I hope that I have helped you to see plastics packaging from the viewpoint of one who sincerely believes that its even greater future is in the trash can.


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