Book makes it clear

A big customer for Bosch auto lights balked at the foam packaging. It demanded visibility. Within weeks, an RF-sealed PVC "book" was in production.

As the friction-fit "book" is opened, all the mounting and installation parts are clearly visible in eight separate locations.

It hardly seems fitting, in an article about the automotive aftermarket, to talk about a "crash" project. Especially for Robert Bosch Corp., the West German manufacturer whose wide product lines include a notable anti-lock braking system.

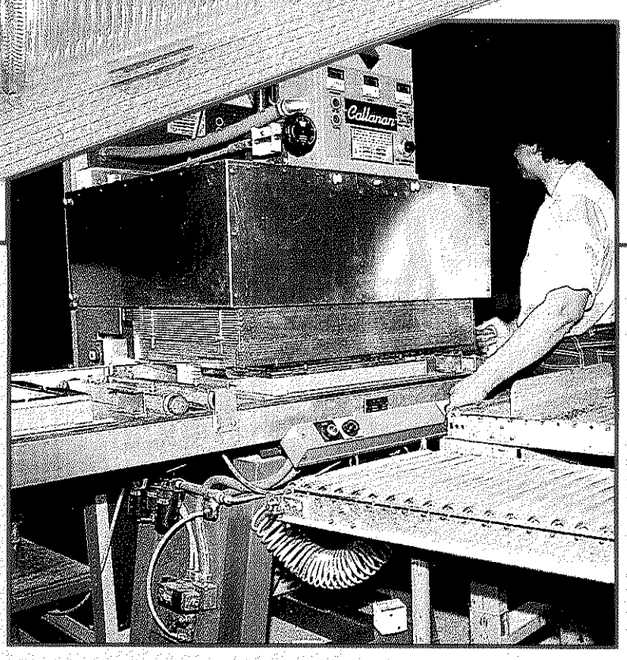
Still, there's no other way to describe the urgency of Bosch's situation last fall, when it had just 10 days to develop the prototype for a completely new package and a scant seven weeks to get into production. What would happen if it failed? The almost certain loss of a major U.S. customer for its automotive lighting products.

Ironically, says product manager David Marek, Bosch had just improved on a foam tray and paperboard carton that had won awards in 1984. "We were proud of the new package. We took it to the buyers with enthusiasm."

So Bosch was hardly prepared for this particular customer's response: "We won't buy that! We want your product in a see-through plastic clamshell."

There was no room for negotiation, Marek recalls. "They made it clear that we had to make a change. Then they told us they wanted to see a prototype in 10 days."

New double-bifold blister-pack is the latest package innovation for Robert Bosch's automotive products. The award-winning folding carton that had been used before is shown at left.

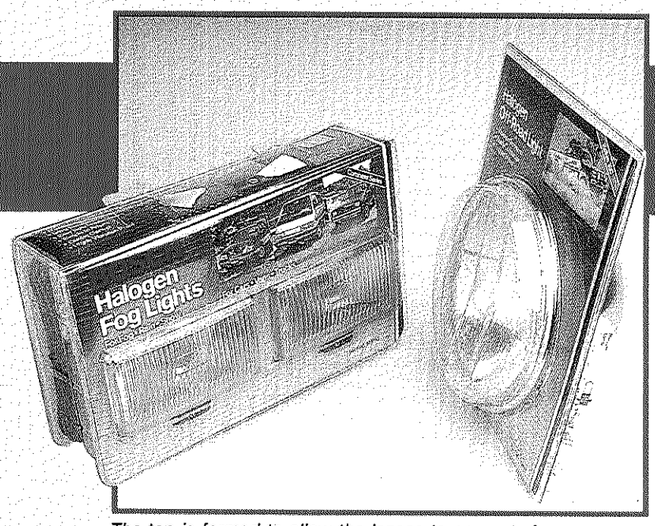


At Bosch's Atlanta warehouse terminal (right), a worker uses a radio-frequency sealing machine to bond together the assembled blister-pack.

The shock came last September. The concept was ready within the decreed timeframe. Just weeks later, in mid-November, Bosch received the sales orders from this important customer. Packaging began in January, and by mid-March driving and fog light kits in the new packaging were moving out of its Atlanta distribution center.

What Marek calls an "impossible timetable" could never have been met without herculean effort by all concerned.

- "Quarterback" for the project, consultant Arthur Glass. He helped Bosch select the vendors and acted as coordinator.
- Thermoformer Dordan Mfg., which developed the package concept into what it calls



The top is formed to allow the lenses to pop out. A new stand-up double blister is used for the Off-Road light.

the Thermobook® (patent pending). Dordan designed and built the tooling for manufacturing the double-bifold container.

- Ideal Packaging Group, which produced the elaborately-printed and die-cut paperboard insert.
- J. A. Callanan Co., which supplied the radio-frequency sealing machinery and custom-built dies for Bosch's kit assembly and packaging plant.
- And don't overlook master woodworker Wally Warner, who fashioned the prototype molds.

Of course the project didn't go through without a few bumps, plenty of midnight oil and much close cooperation among the participants.

Results were worth it. "I think this is a revolutionary package, a near-perfect package for us," raves Marek.

First, wood molds

The first of the impossible deadlines was the creation of the prototype that the customer demanded in 10 days. Bosch called in Arthur Glass and spelled out the requirements.

"We told Arthur we needed someone to design a plastic box for these kits. It had to be square, solid and tough. It had to offer product visibility. It had to be hangable and pilfer-resistant.

"The real challenge," Marek continues, "is that we were going to put a premium, high-priced product into it. So we needed a 'feature' package that had the feeling of added value." The Bosch product line is costly, explains Marek, because it offers a top-quality product. Other plastic packages are used for less-expensive light sets. But they usually reflect the price/value relationship of the product.

Still, at the time, the emergency was to get the ideas translated into prototypes that could be presented to the customer in just days.

Wally Warner of WW, Inc., provided that help. Warner is a modelmaker who crafts shapes with various woods. He and Glass had worked together before. Warner fabricated wood molds over which heated plastic sheet was stretched to make the prototype packages for Bosch's new designs. Needless to say, every step of the package design was cleared through Dave Marek's office in Broadview, Ill.

While the prototypes were necessarily a bit rough, they were very presentable. After they were shown to the customer, Glass and his team began to look at the refinements and modifications that would improve upon them. But nothing concrete was done until mid-November, when Bosch received the sizable order.

Marek is emphatic about the contributions of Glass and Warner. "Without Arthur Glass, none of this would have fallen into place," he states. "And without the efforts of Wally Warner, who did the wooden forms that allowed us to make prototypes, this project would have failed. That's as clear as I can say it."

Shift to double bifold

While the company was awaiting the customer's decision, Glass brought together executives from Bosch and Dordan. Dordan was selected as thermoformer because it has in-house capability for designing and building its own tooling as well as producing finished parts.

Working from package concept, Dordan president Dan Slavin began to develop the finished package specifications. As he looked at the package and the components that had to be loaded, Slavin thought that a double-bifold design might be the answer. He and his general manager, John Kreider, "doodled" out some concepts. Then Kreider worked up the design on the company's computer-aided-design system. Bosch was enthusiastic.

"As hard as we worked, we couldn't have met the timetable without quick decision-making by Dave Marek and the people at Bosch," Slavin recalls. "Their recommendations and approvals allowed us to meet the deadline."

While the designers began to make the refinements to the package specs, Glass and the Bosch staff were considering techniques for sealing the package. The technology for package sealing was a concern because Bosch's packaging and distribution warehouse used only relatively unsophisticated equipment at that point. The deciding factor was seal appearance; that's why radio-frequency sealing was chosen.

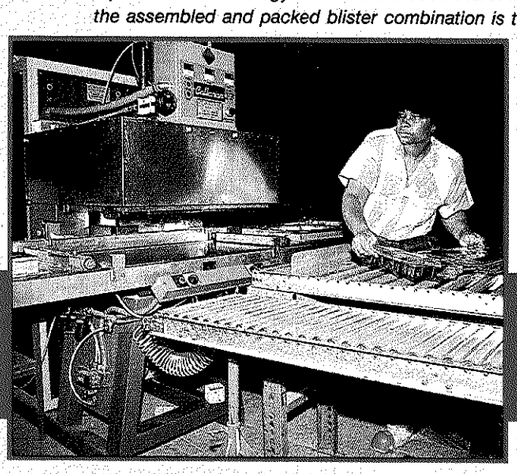
The right sealer

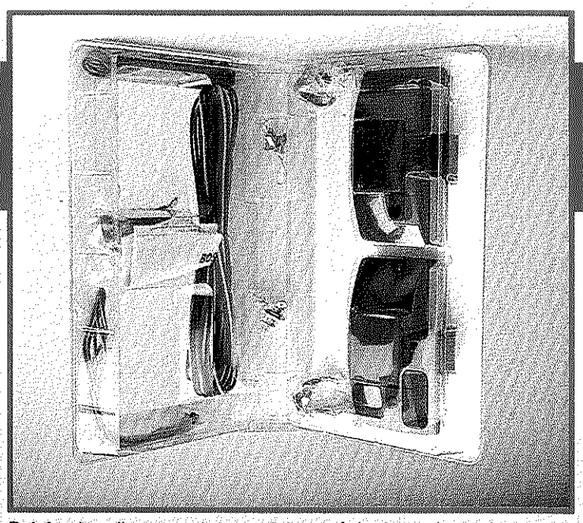
"The people at our terminal are experienced in assembling and packaging kits, but they had little experience with equipment," Marek recalls. "Our plant manager there was really helpful. When we got into production, it was trying at first. Now that we've had some time with the sealing machine, our quality is improving and the operation is working more smoothly."

Bosch selected a left-right, shuttle-table RF sealer from J. A. Callanan. Together with the custom-built sealing dies, the sealer represented the largest investment in the project. In fact, Marek says, it's probably the largest capital investment for packaging ever made by Bosch's automotive products group in the U.S.

While the sealer was being

The addition of the radio-frequency sealing system at the Atlanta warehouse represented technology never before used there. In the process, left to right, the assembled and packed blister combination is transferred from the





Reinforcing ribs around the periphery of the base thermoform add to the package's rigidity and stability.

constructed, the seal dies had to await final package specifications. And those were changing as sample parts were made and tested. The major modifications, Slavin says, were the internal cell arrangement and the addition of reinforcing ribs around the periphery.

At the package top, the polyvinyl chloride material is die-cut to provide two hanger tabs for pegboarding. These also help to vent the heat out of the package while it's being sealed, Slavin points out. Another feature is a male/female channel around the base. This provides a friction-fit closure so the "book" can be snapped open and reclosed without damage.

"That's a real plus. We took one package and opened and closed it about 500 times and the package retained its integrity," says Marek. "Although the consumer can see a lot through the package, this feature allows it to be opened so that all the parts can be checked."

Into production

When the design was finalized, Dordan began manufacturing the mating molds, using Bridgeport Machines' CNC programmers and milling machines. The base is deep-drawn, but the top is also molded to conform to the light lenses and also to provide two reinforcements along the spine that permit the repeated folding action.

Both pieces are made side-by-side, one-up, on Lyle Industries' thermoformers. The rollstock is 20-mil general-purpose PVC. The prototype was done in 30 mils, and Dordan produced samples as thin as 18 mils. "That just didn't look or feel rigid enough for this product," says Marek.

Inside is a die-cut card of .016 SBS, printed offset in four colors by Ideal Packaging Group. The card and the other product components are loaded into the base on a conveyorized assembly line in Atlanta. When all the components are in place, the top thermoform is placed in position.

The sealer is an 8-kw single-phase unit equipped with an 18x30-in. press. Sealing dies are provided for an operator on the right and left side. While one operator is loading or unloading a sealing die, the other can be sealing a package. Output of 5 packages/min or more is possible with two operators.

For uniformity and appearance, Bosch specified an oversized flange on the thermoforms that is die-cut while the seal head is bonding the top and bottom blisters. When the package shuttles out of the sealer, the operator strips away the excess plastic cut from the flange. Each package is then folded closed and loaded into a 200#-test, C-flute corrugated shipper from Design Packaging. It's tape-sealed for shipment.

Economics prove out

Bosch currently uses the same set of matched blisters for three different products: clear and amber fog lights and driving lights. Only the insert card changes. This helps keep package costs near the same level as the previous package that had comprised a foam tray of expanded polystyrene and printed paperboard carton.

"This new package represents a 1-percent cost increase when you compare the components," Marek says. The cost of molded foam parts has been increasing, he points out, and the insert card doesn't require the ultraviolet finish that the previous carton did.

It's still too early to tell whether the new package will add labor cost for the Atlanta plant. "The jury is still out on that. It's more complicated than before because we've got the radio-frequency sealer. When the people get accustomed to this package style, I think it'll end up pretty much the same," the product manager says.

Within the Bosch organization, though, the new package has begun to cast a longer lightbeam. It's "sister" company in Canada is excited about the pack. One of the largest chains of auto parts stores there has already accepted the new package. Farther afield, Marek adds, interest has also been expressed about the package in Europe and in the Far East.

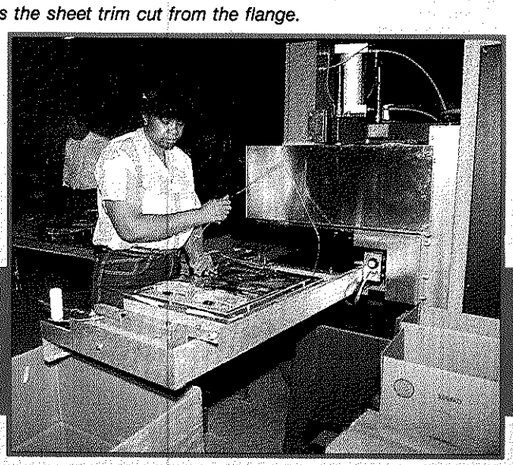
In the same vein, Bosch is now packaging its large off-road lights in a stand-up double blister from Dordan. Because these large lights require a deep 3-in. draw, a 30-mil PVC is used. Since the firm began to pack them in single-light styles, new mass merchandising outlets have been added to the traditional auto parts stores as customers. An ignition kit is slated to be repackaged in RF-sealed blisters later this year.

"Originally, our objective was simply to keep a major customer," Marek concludes. "Since then, the new packaging has had a big impact on our company and on other customers."

Thus it appears that the story of the "book" package is far from ended.

More information is available from: **Dordan Mfg. Co.,** 4451 N. Elston Ave., Chicago, Ill. 60630, 312/777-0087.

assembly conveyor into a specially-built die at each side of the shuttle sealer. When the package has been sealed and returns to the load/unload station, the worker removes the sheet trim cut from the flange.



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