



Recent Developments in **PACKAGING AND FILLING** *of Paints and Coatings*

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Packaging and filling, while clearly not the most glamorous aspects of the paint and coatings industry, remain very important to the market. The equipment utilized to transfer coatings into containers impacts the efficiency in which product can reach the end user. Any developments that increase the speed of the process reduce cost. The same is true for machinery used to print and apply labels. While sizes of containers have not changed for a long time, some developments in type, shape, and methods of filling have been occurring. Paint manufacturers are investing more in complex label designs in order to bring shelf presence to their particular brands. Digital printing and advances in color processing have made it possible for these labels to be produced at much more reasonable cost.

Some changes in the coating industry itself are impacting the providers of filling and packaging

equipment and materials. "One of the most significant events has been the movement of manufacturing operations in the paint and coatings industry to China and Vietnam," says Alan M. Winter, technical sales engineer with Ideal Manufacturing & Sales Corp. "In essence many American jobs have been lost or 'outsourced,' and these changes have resulted in many companies in the United States closing or consolidating their plants in an effort to remain competitive and profitable. These movements have also had a trickle down effect into the equipment manufacturing arena and other related industries which have resulted in many workers being displaced," he continues.

Moving the paint or coating product from the plant to the end user requires that the material be transferred into containers. There are several methods for ensuring that the appropriate amount of liquid coating products gets trans-

Above photo courtesy of Dutch Boy.

ferred to the package. The major currently used processes include electronic net weight, mechanical weight, volumetric, level sensing, and fill by time. Leading companies in this area are Ideal Manufacturing & Sales Corp. and Pioneer Packaging Machinery.

Ideal designs and manufactures liquid fillers, container closers, lid placers, conveyors, unscramblers, and accumulators to fulfill a wide variety of needs, according to Mr. Winter. The fully and semi-automatic packaging machines can be put together to work as individual units added to an existing line or in concert with one another to create an integrated system. "Our liquid fillers are available to process hundreds of product types and can be supplied in virtually endless configurations to fit almost any requirement for industrial and food packaging applications," says Mr. Winter.

Ideal recently introduced its new AE2-CEM Automatic Net Weight Filling and Closing Machine with an optional five gallon Lid Placer for filling one to five gallon containers. This machine features Ideal's newly patented (patent received in July 2003) "Connection Free Fill Cart" where no connections between the filling unit and filling station are required.

"This arrangement has exceptionally fast shut-down and start up because a filling unit only needs to be put in the ready-to-fill position, with its filling head situated over the filling position, in order to establish communications between the filling unit and the filling station. It also provides more accurate filling," explains Mr. Winter. "The lack of connections also reduces maintenance and increases safety, since there need not be any pneumatic or electrical lines extending between the filling unit and filling station. Such lines can cause tripping or which can be easily damaged by traffic adjacent to the filling operations, either while connected or when they are disconnected and trailing from the filling unit and/or filling station," he explains further. In addition, the new AE2-CEM features an all-new free standing extra heavy duty Roller Closer Assembly. Some additional features include a "soft start clutch" to reduce sloshing, and a High Speed Programmable Indicator/Controller.

Pioneer, along with Mount Packaging, sells and builds de-

nesters (for separating containers and getting them ready for the filling process) as well as fillers, ladders, labelers, and palletizers. Pioneer also designs and builds labeling equipment. Mount Packaging is an English based company that is considered to be a world leader in new filling technology. "We partnered with Mount since they have a very strong presence in the rest of the world (Europe, Asia, and the Middle East) and they can sell and service our equipment in those countries," says Pioneer president Howard Frist. "Our strong presence in the U.S. provides a mechanism for them to reach this large market as well," he adds.

Mount's latest design, for which it has received a world patent, is a mass flow filling machine. This concept itself is not entirely new, but prior to this point, it has not been used for small filling applications (like five gallon, and smaller filling), according to Mr. Frist. Using a specially designed mass flow meter that is mounted directly over the container, filling speeds are about double what can be achieved when filling by weight and are doubly accurate to within ± 0.1 ounce per gallon. "This filling is so simple and clean, which is always the concern when looking at a filling machine,

that we feel it will be the desired method of filling in the years to come," Mr. Frist says.

Both Mr. Winter and Mr. Frist agree that developing technology to meet customer needs will continue to drive their businesses.

"Equipment manufacturers must continue to manufacture new and innovative equipment that will allow their customers to continue to automate and streamline their manufacturing facilities to keep them operating in a more efficient manner, thereby reducing overhead and increasing production and profit," Mr. Winter states. "The major issue for the longer term will be what it has always been," adds Mr. Frist. "We will continue to find solutions to our customers' needs and do so in a cost effective manner."

In the packaging arena, Mr. Frist notes that there is a desire to design a "new" user-friendly package, but since the industry has worked with the traditional formats for so long (like a round gallon can or five-gallon bucket), it is very hard to come up with a new alternative. This type of

Selected Players in the Packaging and Filling Marketplace

Containers and Labels

Arca Xytec Systems, Inc.
Cleveland Steel Container Corporation
KW Plastics/KW Can
North America Packaging Corporation
The Oak Printing Company
Phoenix Container, Inc.
Rose Container Co.

Filling and Labeling Equipment

Hoover Materials Handling Group, Inc.
Heisler
Ideal Manufacturing & Sales Corp.
Mount
Pasco
Pioneer Packaging Machinery Inc.
Red Devil Equipment
Sunjut Corporation
Western Equipment Company



Bob Whetstone (right), Vice President of Sales, and Al Winter, Technical Sales Manager of Ideal Manufacturing, show the new Ideal AE2-CEM Automatic Net Weight Filling and Closing Machine.

change would require that many of the items used every day in the industry even on the store level (like paint shakers and paint sprayers) would need to be changed to handle any new concept. Such an industry-wide change is unlikely to happen soon given the tight cost restrictions placed on the coatings industry, according to Mr. Frist.

At least one company, however, has decided to introduce a new consumer-friendly container. The Dutch Boy unit of Sherwin-Williams launched the Twist & Pour container in 2002, first offering its Dirt Fighter paint in the container. The all-plastic gallon container has a design similar to that of detergent bottles, with an easy twist-off lid, side handle, and neat-pour spout. Sherwin-Williams invested millions in converting Dutch Boy to the new packaging, which included providing stores with special shakers for the product. Overall the cost of the paint is increased by a few dollars. The new containers make it easier to tint the paint and also allow retailers to stack more containers in the same shelf space. Consumer response has been very positive. In 2003 the company began selling more of its paint brands in square quart high-density polyethylene containers that are similar to the gallon Twist & Pour jugs.

North American Packaging Corporation (NAMPAC) manufactures the Twist & Pour can exclusively for Sherwin-Williams. According to David Ray, vice president of marketing for NAMPAC, the paint and coatings market is moving from metal container to plastic. "Large retailers like Walmart and Lowes are forcing

some of the change. The relatively high return rate (2-5%) for dented and rusted metal cans is also a contributor," he says. The increasing cost of metal, which has risen over 30%, now makes plastic paint cans more cost competitive with metal as well.

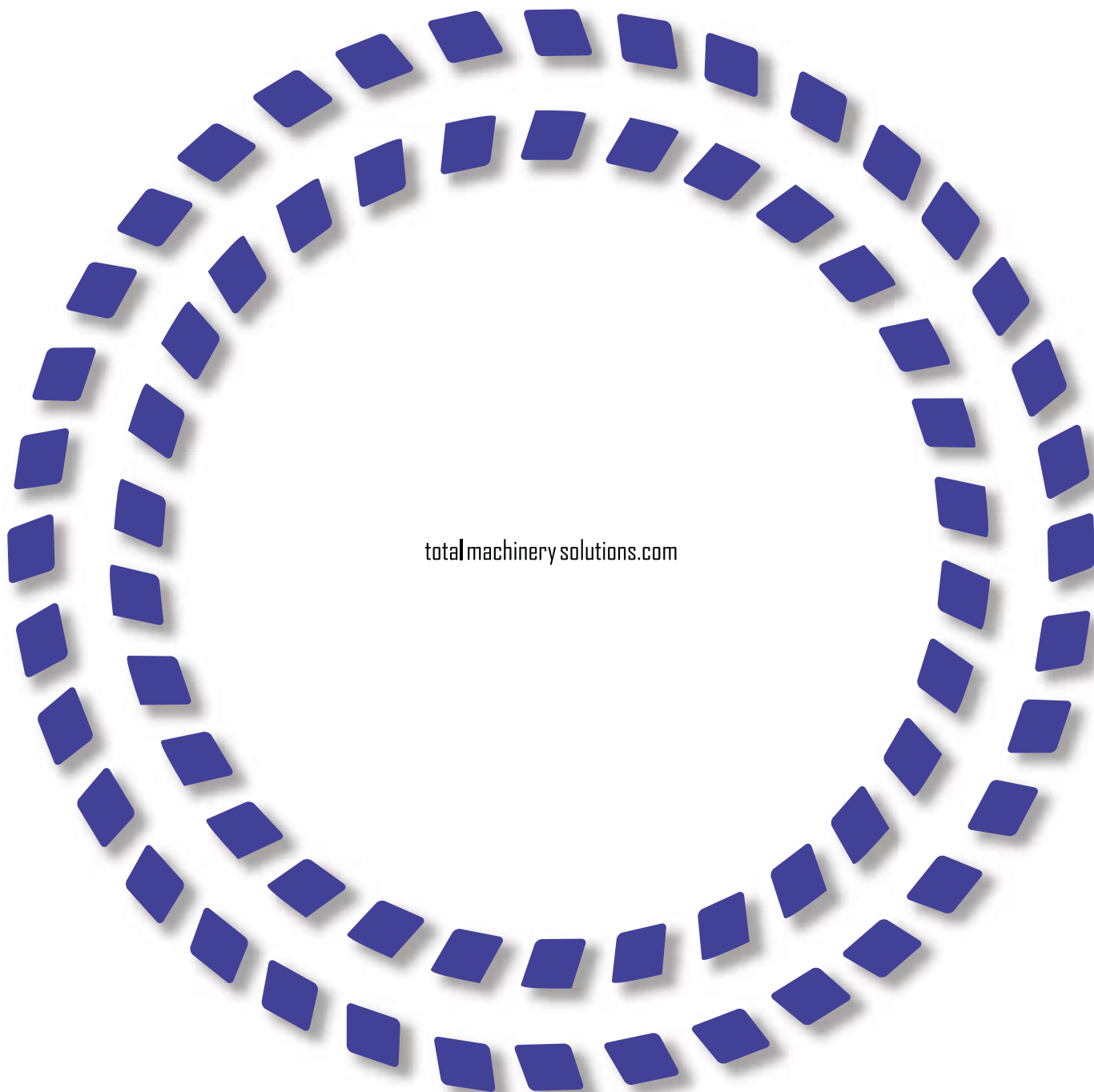
"The move from metal to plastic paint cans is in the early phase of the adoption curve. We expect significant conversions on the horizon," says Mr. Ray. He notes that a number of plastic packages are currently available which are designed to fit on existing fill line equipment. However, their design (a direct substitute for metal cans) is not consumer friendly because they still require tools to open and close and drip when paint is poured out of them. "Because the adoption of consumer friendly packages like the Twist & Pour container will require entirely new filling and labeling equipment as well as changes throughout the entire supply chain, a top-down commitment along with often significant capital investments and heavy marketing expenditures will be required from the paint companies before the industry can make a significant switch to plastic."

NAMPAC is the largest supplier of five-gallon open head plastic pails to the paint industry. In addition to manufacturing the Twist & Pour Container for Sherwin-Williams, the company has its own package called Max-Tite which is a polypropylene substitute for metal cans.

KW Plastics is the largest global supplier of plastic one gallon, pint, and quart containers. For the paint and coatings market, the company offers its hybrid plastic pail with a metal lid and will soon be launching an all-plastic container. "We are currently integrating the production of the all plastic pails into our five manufacturing sites," says Brian McDaniels, national director of sales with KW Plastics. The Snaplock container has been shown to be superior in drip, tip, and other tests.

According to Mr. McDaniels, a key factor in the shift toward plastic packaging has been the dramatic increase in the amount of the architectural paint business that mass retailers have gained over the past 10 years. "Previously, paint companies controlled the market, with paint going from the manufacturing facility directly to the company-owned paint stores," he explains. "Mass retailers are now heavily involved in the market and are looking for ways to reduce costs and protect the product."

So far, plastic containers have only been practical for water-based paints and coatings due to the interactions that solvents can have with the plastic. "Some solvents can weaken the plastic used to form the container. Therefore solventborne formulations are not typically sold in plastic," notes Mr. McDaniels. However, with the increasing emphasis on control and regulation of

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volatile organic compounds (VOCs), more waterborne paint and coating formulations are being introduced to the market, and these products can be shipped and stored in plastic containers. "Our growth has been tremendous. We even have people from markets that we have not even approached yet, such as industrial and marine coatings, that are testing are containers because they now have products that are compatible with plastic," continues Mr. McDaniels.

In addition to switching to plastic containers, Terry Johnson, director of sales-IBCs with ArcaSystems, notes that the paint and coatings industry is also moving toward the use of shipping containers that are larger in size, including semi-bulk and bulk containers. Arca Systems has positioned itself to take advantage of this trend. The company offers returnable and reusable plastic intermediate bulk containers (IBCs) used to fill and ship nonhazardous liquid products. The container system uses an inner liner that is disposed of after every use, and the outer container folds down after use for shipping and storage. "The ComboLife 300 is differentiated from others on the market because the liner system eliminates the need for washing and insures that the customer's products are in contact with virgin material for each filling," says Mr. Johnson.

Phoenix Container is one of the companies that continues to provide metal containers to the paint and coatings industry, offering 2 to 6.5 gallon metal pails. President Kenneth Sokoloff notes that metal containers have some advantages over plastic ones, including the fact that plastic five-gallon

ComboLife 300



Photo courtesy of ArcaSystems.

pails are not as readily recyclable as the metal ones. In addition, the risk of plastic burning and resulting in loss of product is greater. Finally, he points out that plastic pails tend to be reused by the homeowner, and

they can pose a danger to small children, who can drown if the pails are full of liquid. Metal pails are typically not reused by consumers.

Phoenix has partnered with the Brazilian company Brazilata, which has developed a unique plug-in triple tight paint can that enables the paint to be tinted without removing the cap. "One trend in the industry is the increasing use of tinting to achieve a wide array of colors," says Mr. Sokoloff. This new can makes tinting much easier and efficient. So far the new container has captured 95% of the tinting market in Brazil. In addition to improving the tinting process, fillers run about 10% faster with new can. Also, in the traditional tip test, where containers are tipped over many times to determine their propensity for leakage, the new paint can performs significantly better than currently available cans, according to Mr. Sokoloff. Currently the two companies are evaluating when to introduce the can to the U.S. market.

In the future, the next major technology development for packaging of paints and coatings will be the use of radio frequency identification tags (RFIDs). Larger retailers are beginning to require RFIDs in the units they purchase, and Pioneer's Howard Frist expects that all buyers will eventually demand them as well. "Just like every product now has a bar code, in the future every product will have a RFID label," he says.

The major development in labeling of paint and coating packages revolves around the use of more complex and artistic labels by the product manufacturers. More advanced techniques such as holographic foil and holographic foil hot stamps are seeing more use. Labels with "high impact" colors, and labels with more than 10 colors are also more commonplace. While these labels are more costly to produce, they make the package stand out and give it shelf presence.

Pressure sensitive labels are now widely used in Europe as the preferred means of decorating a container, according to Pioneer's Frist. They are not used much in the U.S., though, due to the higher cost of the labels and the lack of infrastructure available for printing the labels. "Most large label printing equipment in the U.S. is designed for paper labels, and many companies stock several months worth of paper labels. They are not likely to want to change labeling equipment since the use of pressure sensitive labels will be very light in the beginning," Mr. Frist notes. Pioneer has designed a machine that can apply both types of labels, which allows customers to run paper labels on one batch and then on the very next batch to run pressure sensitive labels. "We believe that pressure sensitive labeling will be the method of choice in the future. This machine will be a great asset to those companies making the switch," says Mr. Frist.

Oak Printing specializes in label design and production and also provides label fulfillment services for architectural paints. According to Jim Helms, president of Oak Printing, the key changes that have occurred in label printing have happened on the pre-press end of the process. "We have become much more involved in the entire label development process over recent years, from creative design through asset management," he notes. Oak Printing is now involved in providing technical and regulatory support to its customers. "Quality isn't the differentiator any more. Closely aligning the business with customer's needs and providing solutions through value added services are what separates today's print providers. That includes regulatory support, assistance with specialty labels, and fulfillment services to name a few," Mr. Helms continues.

The company has moved to a fully digital, computerized pre-press system as one way to provide those value-added services. "Customers are now able to submit their projects over the Internet using a standard web browser," says Keith Crawford, director of pre-press technology with Oak Printing. An online evaluation process ensures that the project meets their requirements before submission. Using Oak's web-based proofing solution, customers can now review and approve label projects simultaneously across the organization or the world at any time. The cost of sending proofs back and forth, along with the associated delays, is eliminated. "All of these tools work together to reduce the cost and streamline the process of getting a project to press," notes Mr. Crawford. "Digital workflow enables us to respond to our client's label changes much more readily. One of our goals is to simplify their life," he explains. "Digital work flow also enables us to accommodate change much more easily."

Among the host of benefits that the digital workflow brings are advanced techniques to manage color. "Color management begins at the design stage now and is considered and managed throughout the process—from concept to the printed sheet," says Mr. Helms. "We can maintain color consistency throughout the process and provide predictable, repeatable color," he adds. Today the proof is created to match the printing capabilities of the press rather than the other way around, as it had been traditionally done for many years. The color reproduction boundaries of a given printing press or proofing device are determined using specialized equipment, and these parameters are built into the proofs themselves. This helps to ensure fidelity from proof to sheet.

The increasing demand for more complex labels with greater shelf appeal using multiple special ink colors has led to developments in color processing techniques as well. Two new color technologies have made

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Photo courtesy of Oak Printing.

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it possible to create these higher impact labels demanded by the paint and coatings industry. The hexachrome process is a six-color system (as compared to the traditional four-color system) that allows for accurate simulation of 90% of the Pantone® library as well as more vibrant photo reproduction. With this process, it is now possible to produce labels with 10 to 12 colors cost effectively as compared to the traditional method of custom matched Pantone or other colors.

Producing labels using the hexachrome process, however, introduced some new problems largely associated with undesired patterns generated due to conflicting screen angles used to "separate" six colors. Combining the hexachrome printing process with stochastic screening successfully addresses these issues. In traditional screening, the various tonal ranges of colors are created by producing dots of varying size—yet at equal spacing. A large dot produces a dark area, while a

small dot produces a light area. In stochastic screening, micro-dots of equal size are placed randomly at varying concentrations. A greater concentration of dots produces the dark tones and lesser concentration produces the light tones. This process enables the printer to achieve a highly detailed image approaching photographic quality and faithfully simulate custom colors. "Stochastic printing is a much more forgiving process," says Mr. Crawford. "It makes it much easier to address all of the variables involved in the printing process. The ultimate result is a better end-product."

Oak Printing has also seen an increased demand for its fulfillment services. Customers that have thousands of SKUs are now relying on Oak Printing to stock their labels and have them available on demand, according to Mr. Helms. Many also want a centralized source for labels that can be sent to multiple locations across the country. **CT**

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