

Plastics growth seen continuing through 1980

Demand for most resins will rise little this year, but likely will expand faster during rest of 1970's



Market demand for the major plastics will continue to grow rapidly. But it will be growth under markedly different conditions than the U.S. plastics industry witnessed during the past decade or so. Growth, for one thing, will be constrained by feedstock shortages and the availability of plant capacity during the rest of the 1970's. Prices probably will be on an uptrend. In general, the current sellers' market will remain much more in evidence than was the case previously. And a considerable new investment in plants will be needed.

These are some of the conclusions that can be drawn from forecasts presented at the Division of Chemical Marketing and Economics' symposium on plastics—raw materials to end markets. Most speakers at the symposium were pretty much in agreement that the upheavals stemming from the energy crisis of the past year, coupled with the lessons learned from a long period of excess capacity and low return on investment earlier, are remodeling traditional patterns of competition and end uses for the plastics industry.

The most immediate impact is slower current growth in consumption of many major resins. Giles E. Disch of Tenneco Chemicals, for example, estimates that demand for polyvinyl chloride will total about 4.8 billion pounds this year, up only 2% from 1973's 4.7 billion pounds. "We entered 1973 with a sold-out industry and no new capacity available until late 1974 or early 1975," he points out. Raw material shortages and plant breakdowns as vinyl chloride and resin producers "pushed their facilities to the limit" have added to the problem.

Consumption of styrene polymers and copolymers probably will not quite match 1973's level of 5.31 billion pounds, according to Edmund S. Childs, vice president of DeBell &

Richardson, Inc., an Enfield, Conn., market research firm. Last year, sales increased by 14%, to exceed the industry's midyear capacity, as producers drew upon their inventories. But Mr. Childs thinks the market could have grown by 25% in 1973 and would grow by a like amount again this year "had supplies been available."

Similarly, demand for polypropylene this year will total 2.31 billion pounds, only a 4% increase from last year, according to Robert W. Unterreiner of Amoco Chemicals, with growth "hampered by capacity restraints and a temporary slowdown in several market segments." Demand had been up about 30% in both the two previous years. The market for polyurethane foams also will expand considerably more slowly this year and next, says Carl A. Steinbaum of Chem Systems, "as a result of the severe feedstock shortages and shifting economic activity." Compared to a compound annual rate of growth of about 20% since 1965, consumption of foams will be up only 8% this year (to 1.54 billion pounds) and an additional 11% next year (to more than 1.7 billion pounds), Mr. Steinbaum estimates. And polyester resins also will experience a flat year, after registering a 17% growth in consumption to about 1.1 billion pounds in 1973, Marshall M. Levy of PPG Industries forecasts.

The current market constraints are likely to be alleviated in the longer run, however, the speakers at the CM&E Division's symposium believe. Nevertheless, several of them project somewhat slower growth for some of the major resins during the latter part of the 1970's than in the past. Tenneco Chemicals' Disch, for example, projects the market for PVC resins to hit between 6.3 billion and 6.8 billion pounds a year sometime during the 1978-80 period. That's a growth rate of about 6 to 7% a year, compared with a rate of slightly more than 10% a year during the early part of the current decade.

But Mr. Disch warns that consumption can reach the upper part of his projected range only if considerably increased capacity and more raw materials become available. He figures the industry will have to add at least 1.3 billion pounds of new capacity to its current total of about 6.2 billion pounds a year by the end of the decade.

Mr. Disch is hopeful, however, that a return to a better balance between supply and demand, and a rise in resin

prices, will mean an end to the unsatisfactorily low return on investment that has discouraged new investment by PVC producers. "We do not expect any overcapacity in this industry," he asserts, "and, therefore, the price competitiveness of the late 1960's and early 1970's will not come to bear as much."

Mr. Disch sees other changes taking place in the PVC industry, also. The industry will become more oriented toward rigid products, for one thing, as construction markets, already the leading outlet, become even more dominant. Plants with large-scale reactors

U.S. polypropylene markets are dominated by molding and fiber

Millions of pounds	1973	1974	1978
Injection molding	940	920	1365
Fiber	615	660	1125
Film	125	130	200
Other extrusions	225	305	720
Total domestic	1905	2015	3410
Exports	315	295	270
TOTAL DEMAND	2220	2310	3680

Source: Amoco Chemicals

(18,000 gallons or more) "will make serious inroads into markets served by small reactor facilities," he adds.

More and more small plants, too, will become captive producers if they aren't forced to shut down, Mr. Disch believes, while at the same time producers of rigid PVC products will be building large new plants to meet their own needs. One result will be that the industry will become much more consolidated, but also it will be one "more able to respond to problems and one making sufficient profits that it can expand and do the job that is necessary in the 1970's and 1980's."

About 1 billion pounds of new annual capacity will have to be added to the billion pounds that the nine U.S. polypropylene producers have available this year, Amoco Chemicals' Unterreiner notes, if the industry is to meet 1978 domestic demand, which he projects at 3.4 billion pounds. He figures that probably at least two new producers will enter the U.S. market by then, adding a total of about 400 million pounds of capacity.

Mr. Unterreiner estimates that polypropylene consumption between 1973 and 1978 will grow by about 12% a year, as against a 34%-a-year annual

been production problems with Rio Blanco. No additional stimulation tests have been planned.

Meantime, government efforts on chemical fracturing technology appear more or less in limbo. GAO says that the Interior Department spent about \$380,000 on chemical fracturing between fiscal years 1968 and 1973 before, in effect, abandoning efforts to private industry.

Until fiscal 1974, no federal funds had been spent on massive hydraulic fracturing. AEC and Interior's Bureau of Mines have more than \$1.2 million that could be used for hydraulic fracturing development in fiscal 1974. And Interior has more than \$1 million budgeted for this technique in fiscal 1975.

NCI's cancer testing management shifted

Two major prime contracts have been awarded by the National Cancer Institute as it shifts the management of more of its program to outside contractors.

Late last week, NCI awarded a \$6.6 million, 15-month contract to Tracor Jitco, Inc., to manage the NCI testing program to identify cancer-causing chemicals and physical agents in the environment. Earlier in the week, a nearly \$3.8 million, two-year contract went to Battelle Memorial Institute's Columbus Laboratories for management of NCI's toxicology program for evaluating the safety and side effects of potential new anticancer drugs.

Through bioassay contracts with 17 university and commercial laboratories, NCI has studies under way on the effects of some 450 chemicals as well as ultraviolet radiation. Beginning May 1, Tracor Jitco, Rockville, Md., will start assuming prime responsibility for the contracts now in effect with commercial laboratories at a rate of about one a month. As the NCI contracts expire the company will negotiate each of them as a subcontract. Although NCI will retain scientific control of the program, Tracor Jitco will direct and monitor all aspects of the bioassays, including experimental design, planning of resources (materials, animals, laboratory facilities), conduct of studies, data collection, and analysis and presentation of results.

Under the other contract, Battelle-Columbus, managing NCI's toxicology program from its office in McLean, Va., will establish a network of subcontracting laborato-

ries, the number depending on availability of new drugs ready for toxicology testing. The network will be able to test at least 10 drugs at a time for toxicity and side effects.

Both contracts are of the cost plus award-fee type, in which the actual fee awarded will depend on excellence of performance. The Battelle contract, for example, includes a two-year fee of \$65,592 and an award fee that could reach a total of \$149,004 over the two-year contract period.

Of mice, man, and vinyl chloride

Mice—like rats and, in all likelihood, man—develop liver angiosarcomas from vinyl chloride exposure. "Very preliminary" work on mice by Industrial Bio-Test Laboratories, Northbrook, Ill., for the Manufacturing Chemists Association "tends to confirm the findings" of Prof. Cesare Maltoni, the trade group said last week. Prof. Maltoni, of Istituto Di Oncologia, Bologna, Italy, found liver cancer in rats from vinyl chloride exposure.

After only seven months' exposure at levels of 2500 p.p.m., 200 p.p.m., and 50 p.p.m. vinyl chloride in air, Bio-Test found angiosarcomas in mice at all levels, but not in rats or hamsters. Such tumor development in mice is considered to be fairly rapid. The lack of rat tumors so far is also consistent with Prof. Maltoni's data.

The death toll of workers in the U.S. and abroad due to contact with the chemical, meanwhile, is mounting. Firestone said last week that the death in 1969 of a worker at its Pottstown, Pa., polyvinyl chloride plant "appears to have been related to angiosarcoma." C&EN also has learned that Norway's Cancer Registry now confirms that a Norsk Hydro PVC worker died in 1971 from the liver cancer. And there are two suspected deaths from the disease among Swedish workers. Confirmed and suspected cases of the cancer, at this writing, total 16.

The Occupational Safety and Health Administration, meanwhile, has judged measures to control exposures to the carcinogen "inadequate" at five vinyl chloride and two PVC plants visited in the New Orleans-Baton Rouge, La., area in a March 1974 survey report obtained by C&EN. Without associating firms with specific criticisms, OSHA officials found a "general lack of concern for em-

ployee health" and that actual exposures are generally unknown at the five plants. For these five plants "most safety rules are designed to prevent fires and prevent product loss." And for all plants OSHA finds that "preventative maintenance seems nonexistent."

Price decontrols may hike chemicals supply

The lapsing of federal price controls probably will produce increased supplies of chemical products in the U.S. So says an overwhelming majority of members responding to a recent poll on the effects of price decontrol by the National Association of Chemical Distributors, a Dayton, Ohio-based organization of about 100 small, regional chemical distributors.

The survey showed less unanimity on just when the chemical supply situation might improve, but the typical opinion was that it would be within about six months. One pessimistic respondent, however, believes that the recovery will take anywhere from two to five years, depending largely on the availability of construction materials, equipment, and capital.

Almost all NACD members polled agree that the tendency for chemical users to barter and swap products in short supply has affected their business, with nearly half finding that the practice affects the market "very much." One distributor points out that it has distorted knowledge of consumption, for example. However, only two of the 35 respondents admit to having actually engaged in bartering. They agree unanimously, though, that legislation to prevent bartering and swapping of chemicals will be unnecessary after price controls expire. On the other hand, they are about equally divided on whether bartering will continue when controls end.

By about 5 to 1, NACD members believe that more of the products they sell will remain in the U.S. once price controls are lifted. About half of those surveyed say that an average of 30% of the products they deal in have been diverted to higher-profit overseas markets, in amounts up to 80%.

NACD members generally agree that over the long term (1975 and 1976), price decontrol will increase the availability of chemical materials and restore a balance in the market. They also think decontrol will result in increased production.