AN INDUSTRY-SPECIFIC EXTENSION TO AN INPUT-OUTPUT MODEL

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An input-output model is a powerful vehicle for analyzing industry-level implications of different economic scenarios. An interindustry-macroeconomic model, such as INFORUM's Long-term Interindustry Forecasting Tool (LIFT), is an especially useful simulation tool, as it develops a consistent picture of the economy's interindustry structure and its relationship to both the product and income sides of the macro-economy.[1] One important facet of such a model, however, is that the degree of sectoral detail it can achieve is limited. While LIFT forecasts All Other Chemicals, for example, it does not distinguish among different chemical products, such as the plastic resins Low Density Polyethylene (LDPE) and Polyvinyl Chloride (PVC). In order to provide a dynamic interindustry model of the economy, LIFT does not need to distinguish among individual plastic resins, but, to be useful to a chemical manufacturer, LIFT's sectoral detail must be expanded.

In this paper, a method is developed for extending the detail of an input-output model in order to forecast sales of different plastic resins to their unique markets. In general, the purpose of an Industry-Specific Extension (INSPEX) is to model sales of detailed products to specific markets in an environment that allows forecasting under many different assumptions about the economy. As in similar exercises, an INSPEX works by linking detailed product data to an existing input-output model. It

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[1] INFORUM, the Interindustry Forecasting Project at the University of Maryland, is a non-profit research group that provides economic forecasts and analysis to businesses, academic groups, and government agencies that subscribe to the service.

differs from similar work, however, in three respects:

1) Data - An INSPEX requires a time-series of product-specific data. To compensate for significant gaps in the plastics data, a special procedure for developing consistently-defined residuals was adopted.

2) Market detail - Previous extensions to input-output models focused on expanding the *product* detail of the model. For instance, an extension for the paper industry divided total Paper sales into the sales of different paper types, such as 'Coated, number 8'. Detailed types of paper were sold to different markets, such as Printing and Construction. Each market was clearly identified in the input-output model. In the case of plastic products, however, the markets are not clearly identified in the input-output model, so the structure of the INSPEX is designed to accommodate unique market definition.

3) Technology - Product demand is clearly influenced by changes in technology, tastes, and demographics. More plastic is used in milk packaging, for example, than it was five years ago. Input-output coefficients measure how much of any product is needed to produce another, such as how much plastic is needed to produce one car. In the INFORUM modeling system, input-output coefficients are not assumed to be constant. The amount of plastic used per car, for example, has been increasing in the last decade and is forecast to

increase gradually and then level off. In defining markets for specific products, an INSPEX takes into account the changing use of the product. In determining the market for Low density polyethylene sold to Milk packaging, for example, the INSPEX includes the increasing per-unit use of plastic by the Food industry.

The following section describes alternate methods of linking detailed product data to an input-output model and some of the problems associated with those methods. The general structure of an Industry-Specific Extension is then developed and applied to the plastics industry. In the final sections, the plastics INSPEX is used to forecast the outlook for plastic resins under different assumptions about the economy. In these last sections, the strength of the INSPEX as a forecasting tool is highlighted. By combining the wealth of information available about plastic resins from detailed industry data with the completeness of an interindustry macroeconomic model, a flexible analytic tool is constructed.

Approaches to Industry-specific Modeling

Econometric models based on input-output tables provide a logical starting point for sectoral-level forecasting, since they focus on interindustry behavior. An input-output table portrays the flows of goods and services in an economy between sectors. Each industry is both a demander of goods from other sectors, as well as a supplier of output to other industries. The steel industry, for example, demands inputs such as coal, oil, and business services. In addition, steel is used by the automobile industry, as well as by home appliances and construction. By dividing the flows in an input-output table by total sectoral outputs, an input-output coefficient table is constructed. An input-output coefficient, $a_{i,j}$ measures the amount of one good, i, used in the production of one unit of another good, j. These coefficients can be used to model and forecast interindustry behavior.

There are two approaches to integrating input-output tables into an econometric model in order to forecast at the industry level. The first approach uses input-output coefficients to disaggregate economic aggregates to the industry level. Several well-known forecasting models, such as that of Data Resources, Inc., use this "top-down" approach to disaggregate the macroeconomic model results. An alternate approach models industry-level behavior and then determines economic aggregates by summing the sectoral results. This second, "bottom-up", approach is taken by input-output models developed at INFORUM. The goal of the INFORUM framework is to model as much economic behavior as is possible at the industry level, and then use those industry results to calculate economic aggregates. The LIFT model combines industry-level behavioral equations

with some macroeconomic relationships to forecast both the macroeconomy and its underlying sectoral framework.[2] Although either the "top-down" or "bottom-up" approach provides industry forecasts, both methods are limited by the number of sectors they can efficiently model.

Ideally, a detailed input-output model would include the largest number of sectors permitted by data availability. There are costs to adding sectoral detail to such a model, however, so the size of an input-output model is determined by weighing the benefits and costs of additional detail. In the example noted above, LIFT models an Other Chemicals sector, but does not distinguish among specific plastic resins. Although LDPE and PVC may respond differently to certain economic conditions, the difference in the feedback effects of those unique responses on the rest of the model is probably minimal. The costs of distinguishing among different resins, on the other hand, are large, since the data are not readily available, and since each additional equation requires computer storage and adds to the total computation time needed to solve the model. Diminishing returns from adding more detail to a model imply that at some point the marginal cost of another level of sectoral detail exceeds the marginal benefit from that detail. Since the number of industries that can be included in a model is therefore limited, a number of approaches for extending model detail have been developed.

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[2] See Almon,Buckler et.al., Almon (1986), and Monaco, R. for more complete descriptions of LIFT.

Adams's "Industrial Linking Functions"

Although an input-output model may not include a separate sector for a narrowly defined product, the model often includes the sectors that purchase the product. By linking the sales of a detailed product to those purchasing industries, a forecast for the narrow product can be generated. One such approach builds industrial linking functions to connect product data to an econometric model.[3]

The industrial linking function relies on forecasts of purchasing industries. First, a synthetic market variable is created by weighting the output of purchasing industries by the amount of the product that was used in a base year. The synthetic market includes the demand for the product as an input into the production of other commodities, as well as its demand as a final good. Next, the output of the detailed product is forecast as a share of its total demand. Algebraically, the estimated market for product S_i as an intermediate input and as a final good is given by:

$$S_i(t) = \sum_j a_{i,j} X_{j(t)} + \sum_k d_{i,k} FD_{k(t)} \qquad (1)$$

where

$a_{i,j}$ = input-output coefficient; inputs needed from a detailed product category, i, per unit of output of a broader industry, j;

$X_{j(t)}$ = output of broad category, j, included in the macroeconomic model at time t;

$d_{i,k}$ = final demand coefficient; inputs needed from a detailed product category, i, per unit of final demand, k;

$FD_k(t)$= broad final demand category, k, included in the macro economic model at time t.

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[3] Adams (1986), pp. 178-183, and Adams, Duggal, Thanawala.

The industrial linking function is formed by regressing product shipments for the detailed good, X_i, on the market variables as follows:

$$X_i = b_o S_i^{b1} \ldots z_i^{bn} \quad (2)$$

where

b's = the estimated coefficients,
z_i = variables other than market variables that can be included in the equations.

The form of equation (2) implies that b_1 is the elasticity of X_i with respect to the synthetic market variables. The b coefficients also indicate whether or not the growth in product shipments is proportional to the growth in the markets. If b_1 equals unity, the growth of shipments of i is exactly proportional to the market growth. Since the growth of product shipments may be related to more than simply market growth, other variables, such as a time trend, may be included in the equation as well. Once the synthetic market is forecast by the econometric model, a forecast for the detailed product is generated based on the relationship estimated by equation (2).

Although linking functions successfully expand the forecasting capabilities of a model, there are at least three limitations of the approach. The first is relatively minor and easily remedied. As described, the linking function approach uses a single synthetic market variable to drive specific product demand. The synthetic market is an aggregate market that combines intermediate and final demand for the product from all industries. Instead of analyzing the behavior of PVC sales to the Motor vehicles industry and to the Construction industry

separately, for instance, linking functions define one single composite market for PVC. The forecast of product shipments then depends on its relationship with the aggregate market variable. A more satisfying forecast of total shipments is achieved by identifying each market separately, and then estimating growth coefficients (the b's in equation 2) for each market. This approach allows the relationship between PVC sales to the Construction market to differ from PVC sales to the Motor vehicles market. A second shortcoming of linking functions is their reliance on base-year weights to define the product markets. The aggregate market is defined by weighting intermediate demands and final demands by a base-year input coefficient. However, changes in technology, relative prices, or demand lead to changes in input requirements over time. Using base-year weights to define the product's markets ignores the likely changes in each market's input needs.

The third drawback of the linking functions is the assumption that the relationship between the detailed product and its markets is constant over time. If the product grows more slowly than its markets over the estimation period (b_1 less than unity), that relative growth pattern is sustained in the forecast. Clearly, however, a product's growth is partly determined by its changing relationship with its markets. In the past decade, for example, plastic sales to the food container market grew at a fairly constant rate. Since the food container market was also growing steadily, the historical relationship between the growth of the product and its market was close to unity. In the recent past, however, plastic sales to the food container market have expanded rapidly, while the market for food containers has continued growing at its historically steady rate.

As plastic jugs replace glass bottles, plastic's share of the food containers market has been increasing, prompting faster growth in plastic sales. Even though a product's markets are not expanding, its sales will grow rapidly if its market share increases. If the market share is growing, a forecast procedure that uses the past relationship between the growth of the product and its markets will understate the actual sales of the product. It is also likely that the growth in plastic's share of the food container market will eventually level off. Forecasts of future sales based on the current growth relationship would therefore overstate plastics sales. Since a product's market share fluctuates, the relationship between the growth of the product to its markets will also change. Because the estimated coefficients in the industrial linking functions are constant over time, however, the relationship of a product's growth to its markets' growth is rigidly defined.

The INFORUM Market Quotient Approach

An alternate approach to industry-level modeling, developed at INFORUM, uses "market quotient" equations to link detailed product data to an econometric model. The market quotient approach ensures that the forecast of a product's activity is determined both by the size of the product's market and by the share of that market captured by the product.

Similar to Adams's linking functions, the market quotient approach models a detailed product by focusing on industries in the input-output model that purchase the detailed product. Unlike linking functions, however, market quotients focus on specific markets, rather than an aggregate market. Sales of PVC to Motor vehicles, for instance, are treated separately from PVC sales to Construction. After identifying different markets for each detailed product, the relationship of the detailed product to its markets is defined.

A market quotient relates a detailed product to its markets. A market is defined here as the sales of a detailed product to a particular sector of a larger econometric model. The ratio of detailed product sales to the total sales of the market-sector gives an approximate measure of the sector's input requirements for the detailed product. Specifically, the market quotient for the sales of detailed product i to sector j at time t is defined:

$$MQ_i(t) = \frac{(\text{Sales of i to j})_{(t)}}{(\text{Output of j})}. \qquad (3)$$

The market quotient is similar to the weights used to construct the synthetic market for the Adams linking functions. Unlike the base-year

weights in the linking functions, however, market quotients are constructed for each year of available data. As a product captures a larger share of a certain market, its market quotient will increase. Likewise, a declining market share is reflected in a declining quotient. Once a time-series of the market quotient is calculated, the series is modeled as a non-linear function of time. That estimated relationship is used to forecast the market quotient. Since the outputs of the markets are forecast by the econometric model, a forecast of the sales of the detailed product, i, is the product of the market quotient forecast and the appropriate output forecast, as follows:

$$\text{Sales of i to j (t)} = MQ_i(t) * \text{Output of j (t)}. \quad (4)$$

As with the industrial linking function, the forecast of the sales of a detailed product depends on the forecast of its markets. In addition, however, the sales forecast is also determined by the market quotient forecast. The final forecast is jointly determined by the size of the potential market (output of market j), as well as by the amount of the market captured by the product (market quotient i).

The market quotient approach can be used to model a few additional sectors, or to model an entire industry at a much more detailed level than appears in the econometric model. For instance, an earlier version of the INFORUM model distinguished five different paper sectors. Those paper sectors were not sufficiently detailed, however, to a user of the model interested in paper manufacturing. To provide forecasts of products such as "printing paper, coated 2 sides, no. 1", a market-quotient model was constructed that projected the sales of forty different types of paper to

the sectors of the INFORUM model.[4]

By forecasting the relationship between a product and its markets, and combining those results with a forecast of the markets' performance, market quotient equations link detailed product data to an interindustry model. One shortcoming of market quotients, however, is their assumption that sales data is available that exactly links the detailed product to the sectors of the input-output model. Often, as with the paper model, the detailed market data integrates easily with the interindustry model. In the INFORUM paper model, sales of different papers were specified for markets such as Book publishing and Commercial printing, which were identified in the INFORUM input-output model. In some instances, however, the markets for a detailed product will not correspond to the established sectors of the econometric model. Packaging, for instance, is a significant market for plastics. Packaging, per se, does not appear as a separately identified sector in an industry-based model, however, since it encompasses many different industries. In order to build a forecasting and simulation tool that accommodates more narrowly defined market data, the market quotient approach must be expanded.

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[4] See Almon, et al., pp.188-197. The market quotient approach has been compared to adding a skirt to the bottom of the input-output table of the econometric model. The 'skirt' hangs from the table, but is not part of the interactive framework of the model. There is no feedback from the market-quotient equations to the rest of the model.

Industry-specific Extension (INSPEX)

The purpose of the INSPEX is to use the INFORUM market quotient approach to expand the results of an interindustry model in two directions. As with market quotients, an INSPEX models detailed products not included explicitly in the interindustry framework. In addition, the INSPEX models product sales to *markets* that also are not included explicitly in the interindustry framework.

An INSPEX links market data to an input-output model by creating a synthetic indicator of the detailed market's output. Relevant sectors of the input-output model are weighted by input-output coefficients to create Dynamic Coefficient Indicators (DCI) of the detailed markets. Similar to Wharton's industrial linking functions, DCI's use input weights to create a synthetic market. Unlike the linking functions, however, DCI's do not rely on only base-year weights, but use a time-series of input-output coefficients to create the synthetic markets.

A DCI is formed by first identifying sectors in the input-output model that link with the detailed market. Plastics industry data, for instance, identifies sales to Motor vehicles in terms of the Standard Industrial Classification (SIC) scheme. Since INFORUM's industry detail is also defined in terms of SIC codes, matching sectors are easily identified. Instead of simply aggregating the outputs of the linked sectors, those outputs are weighted by the amount of plastic they use, according to input-output data. The plastic's market for motor vehicles is therefore some portion of the motor vehicle industry's total sales. Specifically, the DCI for a detailed market, j, that is not explicitly included in the econometric model, is defined:

$$DCI_j(t) = \sum_{k=1}^{M} a(i,k)(t) \quad * \text{ (output of k)(t)} \qquad (5)$$

where

M = the number of markets in the input-output model that correspond to the specific market,

a(i,k) = the input-output coefficient for the detailed product (i), used to produce one unit of k.

The Dynamic Coefficient Indicator defines the market for, say, total plastics. The market quotient equations then define the market relationships for detailed products, say LDPE or PVC. The market quotient equation is modified to include the indicator of the specific markets:

$$MQ_i(t) = \frac{\text{Sales of i to j (t)}}{\text{DCI of market j}}. \qquad (6)$$

The forecast for a detailed product's sales to a specific market is simply the product of the forecast of the market quotient and the DCI's.

Using Dynamic Coefficient Indicators, an INSPEX expands the forecasting capabilities of an interindustry model in two directions. The INSPEX not only links detailed product data to an input-output model, it also expands the market specifications for creating those links. In the remaining sections of this chapter, an application of the INSPEX procedure to the plastics industry is developed. The plastics INSPEX links detailed, industry-specific data to the INFORUM input-output modeling system and provides a forecasting and simulation tool for analyzing the plastics industry.

An Application: The Plastics Industry

The skyrocketing price of ivory in the 1890's threatened J. Hyatt's billiard ball business. The search for an alternative to ivory led to the first commercial production of plastic in the United States. Since that time, the rapid pace of technological change in the plastics industry has made it one of the fastest growing industries in the United States. As shown in Figure 3.1, plastic and synthetic materials shipments have grown more rapidly than manufacturing consistently since 1958. One of the sources of this rapid growth has been plastic's versatility in competing with traditional materials such as steel and glass. As shown in Table 3.1, plastic has replaced traditional materials in several sectors of the economy, such as motor vehicles, packaging, and construction. The plastics industry continues to enjoy rapid growth, as new plastics, as well as new applications of plastics are introduced.[5]

A model for forecasting plastics must be able to take into account the numerous specific types of plastics that are sold to narrowly defined markets. In addition, the forecast should take into account the dual affects of the change in the growth of the major markets for plastics, as well as plastic's changing share of those markets. An INSPEX was designed to fulfill these requirements, and was used to build the Interindustry Model for Plastics (IMP).

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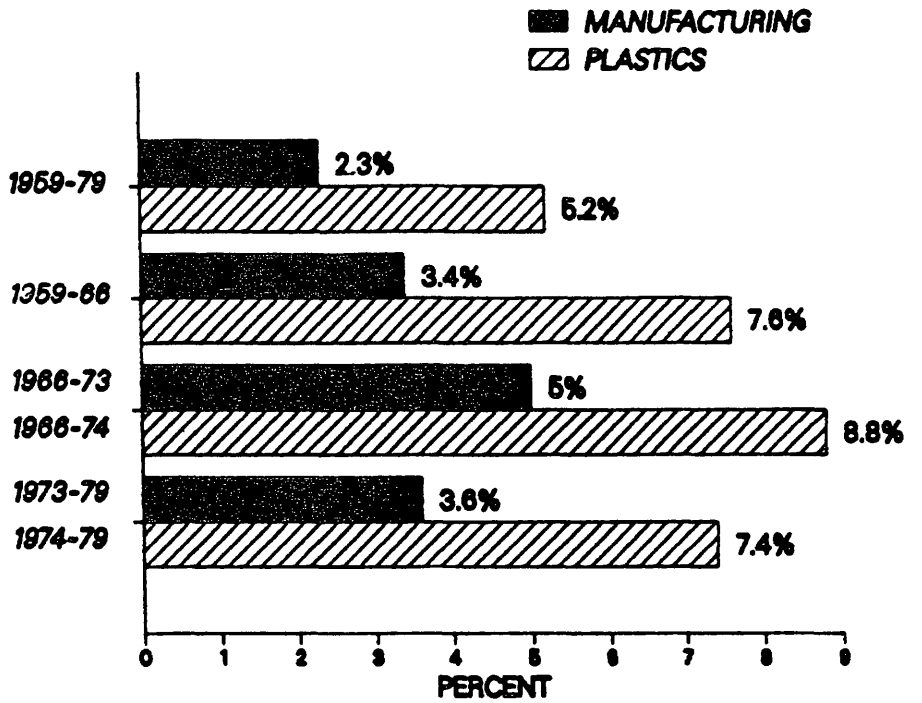
5 See Chiles (1985), Tortulano (1986), and Yeaple (1987).

Growth In Constant-Dollar Shipments
During Selected Peak-To-Peak Business Cycles:
Plastics And Synthetic Materials Vs. Manufacturing



SOURCE: Bureau of the Census and Office of Business Analysis, U.S. Department of Commerce.

FIGURE 3.1

TABLE 3.1 Product Innovations in the Use of Plastic

End-Use Market	Material Displaced
Textiles	
Man-made fibers	cotton, wool
Packaging and Containers	
Plastic bottles (P.E.T.)	glass
Plastic food tubs	paper
Plastic bags	paper, burlap
Building Materials	
Plastic pipe	iron, copper
Vinyl siding	aluminum, wood products
Plumbing fixtures (sinks, bathtubs)	steel, porcelain
Lighting fixtures	glass
Motor Vehicles	
Plastic gas tanks	steel
Radiator overflow tanks	steel
Component housings	steel, zinc
Dash	steel
Electronic Equipment, Computers and Office Machines, and Instruments	
Wire and cable coverings	paper, rubber
Component housings	steel, aluminum
Circuit boards	wood, paper
Chip carriers and mountings	none
Connectors	none
Data storage disks and tapes	none
Plastic lens	glass
Rubber Products	
Synthetic rubber tires	natural rubber
Footwear, hose, and belting	natural rubber
Speciality rubbers	natural rubber
Consumer and Institutional Disposables	
Plastic knives, forks, spoons	wood
Plates - plastic coated	paper
Trays	paper
Beverage cups	paper
Health care and medical products	glass, steel
Aircraft	
Plastic/graphite fiber composites	aluminum, steel
Adhesives	
Epoxy, phenolics	natural glues

SOURCE: Office of Business Analysis, U.S. Department of Commerce.

There are three main steps in building an INSPEX such as IMP. The initial preparation involves choosing a modeling system to link to the detailed product data and then setting up the product data. Once a data base is established, the market quotient equations are estimated. This step includes defining the links between the detailed product data and the input-output model to construct the Dynamic Coefficient Indicators. Finally, the market quotient projections are combined with results from the econometric model to forecast the performance of the detailed product. Each of these steps is described in greater detail in the following sections.

Choosing a Modeling System

The purpose of an INSPEX is to forecast detailed product series by linking those series to a model of the economy that includes some industry detail. Not surprisingly, the INFORUM system of models is ideally suited for serving as the parent model for an INSPEX. The primary forecasting and simulation tool of INFORUM is its 78-sector Long-term Interindustry Forecasting Tool (LIFT). LIFT provides a complete forecast of the product and income sides of the economy and is based on industry-level relationships. In addition, INFORUM expands the 78-order product results to 420 product groups using the Detailed Output Model (DOM).[6] DOM provides 420-product detail for outputs, intermediate sales, and final demand purchases for personal consumption, investment in equipment and in structures, inventory change, and government. The detailed forecasts of DOM are completely

[6] See Robison for more detail on the development of the Detailed Output Model.

consistent with the LIFT model results. Since the detailed product data from SPI specifies narrowly defined markets, the plastics INSPEX is linked to the 420-sector DOM model, as well as to the LIFT model.

The Data

Constructing a data-base with time-series of detailed product sales can be the prohibitive step in crossing the bridge between the theoretical INSPEX and a practical application. In building a plastics data base, a special procedure was adopted to compensate for gaps in the original data.

The Society of the Plastics Industry publishes an annual Major-Market Survey that reports the sales of approximately nine different thermoplastic resins to more than thirty different markets. A sample page from one of the surveys is shown in Table 3.2. The markets are divided into eleven major market categories, such as Transportation and Packaging. These major markets are then further divided into sub-markets, such as Motor vehicles and parts, in the Transportation major market, and Flexible packaging in the Packaging market.

In examining the SPI major market surveys, two problems become apparent. The first problem is a lack of consistency in the surveys over time. Although the survey exists from 1971 to the present, definitions of plastics and their markets changed over the course of the first few years of the survey, so that a consistent time-series of data for only eight years, 1975-1982, was available.[7]

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[7] The IMP model has since been updated with data through 1986. Since 1987, IMP has been replaced with a larger, more detailed plastics model.

TABLE 3.2 Sample Data Table from SPI

THE SOCIETY OF THE PLASTIC INDUSTRY, INC.

1985 DISTRIBUTION OF PLASTIC RESINS SALES & USE (*CAPTIVE*) BY MAJOR MARKET

(In millions of pounds, dry weight basis)

MAJOR MARKET	Low Density PE		High Density PE		Polypropylene		ABS & SAN		Polystyrene		Styrene Latex & USP	
	QUANTITY	% OF TOTAL	QUANTITY	% OF TOTAL	QUANTITY	% OF TOTAL	QUANTITY	% OF TOTAL	QUANTITY	% OF TOTAL	QUANTITY	% OF TOTAL
TRANSPORTATION, TOTAL	D	D	183	2.7	230	4.4	269	24.5	D	D	D	D
Motor Vehicles and Parts							240	23.6				
Ships, Boats and Recreational Vehicles												
All Other Transportation Equipment												
PACKAGING, TOTAL	5,469	62.2	1,355	50.4	1,000	18.9	D	D	1,292	31.9	D	D
Bottles, Jars, Vials	18	0.2	1,122	16.9	101	1.9			68	1.2		
Food Containers (Including Disposable Cups)	386	4.4	831	12.5	128	2.4			807	19.5		
Flexible Packaging - (Bags, Liners, Etc.)	4,402	50.1	402	6.0	419	7.9			148	3.6		
Household and Institutional Refuse Bags & Liners	2,212	25.4	85	1.2	261	4.9						
All Other Flexible Packaging	2,190	24.7	317	4.8	158	3.0			148	3.6		
All Other Packaging	665	7.5	998	15.0	352	6.7			296	7.2		
BUILDING AND CONSTRUCTION, TOTAL	327	3.7	546	8.2	D	D	134	12.2	669	10.9	D	D
Pipe, Conduit and Fittings	48	0.5	493	7.4			122	11.1				
Building Materials for All Structures	129	1.5							416	10.1		
Siding, Siding Accessories and Structural Panels for Siding	-	-					-	-	-	-		
Flooring	-	-	-	-			-	-	-	-		
Insulation Material									394	9.6		
All Other Building Materials for All Structures									22	0.5		
All Other Building and Construction	150	1.7							11	-		
ELECTRICAL/ELECTRONIC, TOTAL	493	6.0	153	2.3	273	5.2	241	21.9	309	7.5	D	D
Home and Industrial Appliances					120	2.3	206	18.7	267	6.5		
Communications Equipment												
Electric Equipment Combined with Electronic Components					116	2.2						
Storage Batteries	-	-					-	-	-	-		
Wire and Cable	336	3.8	130	2.1								
FURNITURE AND FURNISHINGS, TOTAL	37	0.4	46	1.0	1,119	21.2	D	D	67	1.1	327	30.8
Rigid Furniture									-	-	-	-
Flexible Furniture			-	-					-	-	297	28.0
Carpet and Carpet Components			-	-	729	13.8					30	2.8
Other Textiles and Furnishings					300	5.7						
CONSUMER AND INSTITUTIONAL PRODUCTS, TOTAL	468	5.3	507	7.6	623	11.8	D	D	1,090	26.5	D	D
Disposable Food Serviceware (Includes Disposable Cups)	175	2.0	49	0.7	67	1.3			679	16.5		
Health Care and Medical Products	81	0.9			270	5.1			71	1.7		
Toys and Sporting Goods			90	1.4	29	0.5			156	3.8		
Hobby and Graphic Arts Supplies					16	0.3			30	0.7		
All Other Consumer and Institutional Products	161	1.9	344	6.3	241	4.6			154	3.8		
INDUSTRIAL/MACHINERY, TOTAL	D	D	161	2.1	11	0.2	D	D	D	D	D	D
ADHESIVES/INKS/COATINGS, TOTAL	116	1.3	-	-	D	D	-	-	D	D	337	31.8
Adhesives and Sealants											19	1.8
All Other Inks and Coatings											318	30.0
ALL OTHER (RESELLERS, COMPOUNDERS), TOTAL	811	9.3	843	12.6	1,097	20.0	160	14.5	875	20.1	77	6.9
Resellers and Compounders	559	6.4	589	8.8	834	15.8			576	14.0		
Sales Unidentified	272	3.1	754	3.8	263	5.0			249	6.1		
EXPORTS, TOTAL	1,131	12.9	877	13.1	875	16.6	D	D	84	2.0	D	D
GRAND TOTAL	8,790	100.0	6,651	100.0	5,274	100.0	1,110	100.0	4,198	100.0	1,[illegible]	100.0

(Page 3)

SOURCE: SPI COMMITTEE ON RESIN STATISTICS AS COMPILED BY ERNST & WHINNEY

As shown in the sample in Table 3.2, the data from SPI are also incomplete in many instances because of two types of omissions. The first omission arises from disclosure problems: if a firm is a single producer of a certain resin, its sales are not reported on the aggregate survey so the firm may conceal its performance record from its competitors. The second omission arises when a total is given for a resin to one of the eleven major markets, but no division of this total among its subtotals is given.

Preparing the SPI data first entailed eliminating as many of the gaps in the data as possible. Some of the gaps were easily filled, especially in those instances where a total was given and one of the components of the total was missing. In other cases, the holes were filled based on relationships established by the data in completed portions of the survey. The data for 1975, for instance, was particularly incomplete. Although totals to major markets were provided, few entries for sub-markets were given. To complete the data for 1975, the given totals were distributed among the sub-markets on the basis of 1976 ratios. For example, in 1976, Total Thermoplastics sold to the sub-market Motor vehicles and parts was approximately 70 percent of Total Thermoplastics sold to the major market Transportation. The 1975 figure for Thermoplastics sold to Transportation was reported, and seventy percent of that was allocated to the Motor vehicles and parts sub-market. These calculations were sometimes further adjusted to reflect increasing or decreasing trends in the series, based on recommendations by industry specialists or by the data itself.

Once easily-filled gaps in the data were filled, the series of sales

of each resin to each market was examined. For example, the time-series from 1975-1982 of Low Density Polyethylene (LDPE) sold to the Flexible packaging market was examined. If data for that series was available for each year to 1982, the series was labeled as "complete". All incomplete series were set to zero in each year of data, in order to assemble only those series which were complete. In Table 3.3, a sample table of the time-series for sales of LDPE is shown. Only complete series are shown on the table; incomplete series appear as zero. For each resin, a Total Complete Market is calculated. This total is the sum of the resin sold to all markets for which the series were complete. In addition, SPI reports a Total market that includes the sales to all markets, both from complete as well as incomplete series. The difference between those two totals is a *residual* market for the resin. Because the incomplete series are set to zero in each year, the residual market is defined consistently over time.

An analogous residual is also constructed for each resin. In Table 3.4, a sample table is shown that illustrates the sales of each resin to all markets for a single year. This type of table is a "mix" table, since it shows the mix of resins used by each market. A subtotal is calculated for each market that contains only resin sales from complete series. Since SPI reports the total sales to the market from both complete and incomplete series, the difference between the subtotal and the SPI total is a residual resin. As with the residual market, the residual resin is consistently defined over time, since the incomplete series appear as zero in every year.

The relationship of the residuals and the totals is summarized in Table 3.5 below. The total of the complete series plus the total residual

equals the grand total as reported by SPI. In Table 3.3, 18,344 million pounds of all thermoplastic resins were sold to all markets, but only 17,424 million pounds showed up in complete series. The difference, 909 million pounds, equals both the Residual resin and the Residual market.

TABLE 3.5 Residual Definitions

	Resin 1 - - -	Subtot	Resid	Total
Subtotal		a	0	a
Residual		0	b	b
Total		a	b	c

where a = total of sales from complete series,
c = total sales, as reported by the SPI,
and b = difference between a and c, equals the sum of the Residual Market and Residual Resin.

The mix and time-series tables summarize the available data-base for building a model. A third type of table, a "share" table, highlights the different characteristics of each of the resins. Table 3.6 contains a share table for the year 1986 that shows each resin's sales as a share of its total sales in that year. The table illustrates the relative importance of the different markets to each resin. Both of the polyethylenes (LDPE and HDPE), for example, sell close to fifty percent of their output to the Packaging market. LDPE sells primarily to Flexible packaging, however, while the principal market for HDPE is Bottles,jars, & vials. A change in the Bottles market will affect HDPE more strongly than LDPE, and LDPE sales will be strongly influenced by changes in Flexible packaging. Just how much the sales will be affected is measured by the market quotient equations. Constructing these quotients is the second step in the model-building procedure.

FIGURE 3.2 Titles for Interindustry Model for Plastics

Titles of Thermoplastic Resins

- Low density polyethylene
- High density polyethylene
- Polypropylene
- ABS and SAN
- Polystyrene
- SBL, OSBL, and OSBP
- Nylon
- Polyvinyl chloride
- Other thermoplastics

Titles of Markets

- Transportation
  - Motor vehicles and parts
  - Ships, boats, and RV's
  - Other transportation
- Packaging
  - Bottles, jars, and vials
  - Food containers
  - Flexible packaging
  - All other packaging
- Building and construction
  - Pipe, conduit, and fittings
  - Materials for all structures
  - Other building and construction
- Electrical/electronics
  - Appliances, home and industrial
  - Communications equipment
  - Industrial equipment and batteries
- Furniture and furnishings
  - Furniture
  - Carpet and textiles
- Consumer and institutional products
  - Dinnerware, tableware, and kitchenware
  - Health and medical
  - Toys, sports, and hobbies
  - Other consumer and industrial
- Industrial/Machinery
- Adhesives, inks, coatings
- Resellers and compounders
- Unclassified sales
- Exports
- Total

TABLE 3.3 Sample Time Series Table

** THERMOPLASTIC TIME SERIES TABLE End use of Low density Polyethylene 1983-1986 (in millions of pounds) **

	MARKET	1983	1984	1985	1986	MRKT
1	TRANSPORTATION	0	0	0	0	1
2	Motor Vehicles,	0	0	0	0	2
3	Ships,Boats,R.V's.	0	0	0	0	3
4	All Other Transport	0	0	0	0	4
5	Remainder	0	0	0	0	5
6	PACKAGING	5702	5835	6007	6218	6
7	Bottles,Jars,	32	23	19	59	7
8	Food Containers	299	370	421	545	8
9	Flexible Packaging	4647	4718	4835	4903	9
10	All Other Packaging	723	722	730	708	10
11	Remainder	0	0	0	0	11
12	BUILDING & CONSTRUCT	240	331	347	235	12
13	Pipe,Conduit,Fitting	63	39	51	34	13
14	Materials for Struct	57	102	137	75	14
15	All Othr Build & Con	119	189	159	108	15
16	Remainder	0	0	0	17	16
17	ELECTRICAL/ELECTRONIC	393	455	431	452	17
18	Appliances, home,ind	0	0	0	0	18
19	Communications Equip	0	0	0	0	19
20	Industrial Equip,Bat	363	420	357	382	20
21	Remainder	30	35	73	69	21
22	FURNITURE, FURNISHING	0	0	0	0	22
23	Furniture	0	0	0	0	23
24	Carpet and Textiles	0	0	0	0	24
25	Remainder	0	0	0	0	25
26	CONSUMER AND INSTITUT	574	684	488	529	26
27	Dinner,Table,Kitchen	185	209	182	214	27
28	Health and Medical	139	122	86	41	28
29	Toys,Sports,Hobbies	49	89	49	40	29
30	All Othr Consum & In	200	263	170	233	30
31	Remainder	0	0	0	0	31
32	INDUSTRIAL/MACHINERY	0	0	0	0	32
33	ADHESIVES,INKS,COATIN	0	0	0	0	33
34	RESELLERS & COMPOUND	428	429	566	519	34
35	UNCLASSIFIED SALES	96	119	272	249	35
36	EXPORTS	919	974	1131	939	36
37	TOTAL COMPLETE	8354	8830	9245	9143	37
38	RESIDUAL MARKET	70	99	161	354	38
39	TOTAL	8424	8929	9406	9497	39
40	TOTAL DOMESTIC	7505	7955	8275	8558	40

TABLE 3.4 Sample Mix Table

THERMOPLASTIC MIX TABLE -- End Use of Selected Thermoplastics (in millions of pounds) FOR 1975

	MARKET	LDPEdc	HDPE	PROPYL	STYREN	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1	TRANSPORTATION	0	27	214	0	38	185	0	644	190	835
2	Motor Vehicles, Part	0	0	0	0	0	179	0	336	426	763
3	Ships,Boats,R.V's.	0	0	0	0	0	0	0	0	42	42
4	All Other Transport	0	0	0	0	0	0	0	0	29	29
5	Remainder	0	27	214	0	38	5	0	0	0	0
6	PACKAGING	2674	1087	370	969	0	282	0	5409	135	5545
7	Bottles,Jars, & Vial	25	613	42	81	0	44	0	806	39	846
8	Food Containers	162	209	35	422	0	8	0	837	36	874
9	Flexible Packaging	2280	68	129	29	0	118	0	2626	39	2665
10	All Other Packaging	205	196	163	437	0	110	0	1113	46	1159
11	Remainder	0	0	0	0	0	0	0	0	0	0
12	BUILDING & CONSTRUCT	104	218	0	173	0	1555	312	2565	17	2583
13	Pipe,Conduit,Fitting	30	198	0	12	0	1064	0	1305	220	1525
14	Materials for Struct	34	0	0	145	0	373	0	552	97	649
15	All Othr Build & Con	39	0	0	16	0	117	0	173	234	407
16	Remainder	0	19	0	0	0	0	312	0	0	0
17	ELECTRICAL/ELECTRONIC	285	67	152	244	19	394	191	1515	11	1527
18	Appliances, home,ind	0	0	67	158	0	33	0	259	226	486
19	Communications Equip	0	0	0	0	0	47	0	47	196	243
20	Industrial Equip,Bat	264	0	0	0	0	313	0	577	220	797
21	Remainder	21	67	84	85	19	0	191	0	0	0
22	FURNITURE, FURNISHING	0	0	445	128	0	203	20	1040	39	1079
23	Furniture	0	0	0	0	0	22	0	22	126	148
24	Carpet and Textiles	0	0	432	0	0	180	0	613	317	930
25	Remainder	0	0	13	128	0	0	20	0	0	0
26	CONSUMER AND INSTITUT	710	381	297	618	0	444	165	2617	120	2738
27	Dinner,Table,Kitchen	308	147	92	259	0	45	0	852	98	951
28	Health and Medical	56	25	76	43	0	25	0	227	21	249
29	Toys,Sports,Hobbies	94	121	39	182	0	90	0	527	84	612
30	All Othr Consum & In	251	87	88	132	0	283	0	843	82	926
31	Remainder	0	0	0	0	0	0	165	0	0	0
32	INDUSTRIAL/MACHINERY	0	0	0	0	15	39	47	102	145	247
33	ADHESIVES,INKS,COATIN	0	0	0	0	0	144	542	686	259	946
34	RESELLERS & COMPOUND	240	255	210	244	5	146	52	1210	0	1210
35	UNCLASSIFIED SALES	66	122	10	53	4	59	5	357	0	357
36	EXPORTS	348	227	220	110	9	164	143	1277	0	1277
37	TOTAL COMPLETE MARKET	4429	2387	1920	2543	92	3615	1481	17424	0	17424
38	RESIDUAL MARKET	121	42	28	30	46	0	255	0	909	909
39	TOTAL	4551	2429	1949	2573	138	3615	1737	17424	909	18344
40	TOTAL DOMESTIC	4203	2202	1728	2463	129	3451	1594	17067	0	17067

TABLE 3.5 Sample Share Table

THERMOPLASTIC MIX TABLE - End Use of Thermoplastics (as share of total sales) FOR 1986

	MARKET	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	TOTAL
1	TRANSPORTATION		3.3	4.1	24.4			43.3	2.0	3.7
2	Motor Vehicles, Part				23.5				1.8	3.4
3	Ships,Boats,R.V's.									0.1
4	All Other Transport									0.1
5	Remainder		3.3	4.1	0.9			43.3	0.2	
6	PACKAGING	65.5	50.7	19.4	0.4	30.5			6.7	34.7
7	Bottles,Jars, & Vial	0.6	19.3	1.5		1.2			2.5	6.7
8	Food Containers	5.7	11.2	3.8		17.8			0.5	6.1
9	Flexible Packaging	51.6	6.2	6.5		3.4			2.6	15.2
10	All Other Packaging	7.5	14.0	7.5		8.1			1.1	6.6
11	Remainder				0.4					
12	BUILDING & CONSTRUCT	2.5	7.4		11.4	9.4			63.6	15.5
13	Pipe,Conduit,Fitting	0.4	7.0			0.1			44.3	10.0
14	Materials for Struct	0.8				7.9			14.7	4.1
15	All Othr Build & Con	1.1				1.3			4.5	1.4
16	Remainder	0.2	0.4		11.4					
17	ELECTRICAL/ELECTRONIC	4.8	2.1	4.8	22.3	8.1		16.0	6.4	5.9
18	Appliances, home,ind			2.2		6.3			0.2	2.0
19	Communications Equip								0.3	0.2
20	Industrial Equip,Bat	4.0							5.9	3.7
21	Remainder	0.7	2.1	2.5	22.3	1.8		16.0		
22	FURNITURE, FURNISHING			18.9		1.1	31.6		5.1	5.2
23	Furniture								2.1	0.8
24	Carpet and Textiles			17.2					3.0	4.4
25	Remainder			1.8		1.1	31.6			
26	CONSUMER AND INSTITUT	5.6	11.1	12.6		29.0			3.7	9.8
27	Dinner,Table,Kitchen	2.3	0.8	1.2		18.3				3.0
28	Health and Medical	0.4	0.8	6.8		1.5			1.0	1.8
29	Toys,Sports,Hobbies	0.4	1.1	1.0		4.8			0.2	1.3
30	All Othr Consum & In	2.5	8.4	3.6		4.5			2.5	3.7
31	Remainder									
32	INDUSTRIAL/MACHINERY							7.2	0.2	0.8
33	ADHESIVES,INKS,COATIN								1.1	3.4
34	RESELLERS & COMPOUND	5.5	6.9	16.2	11.7	12.6	3.5	5.0	3.5	7.7
35	UNCLASSIFIED SALES	2.6	2.9	3.7	0.9	5.6	1.7	0.5	2.5	2.9
36	EXPORTS	9.9	13.1	19.4	13.5	2.6	6.4	8.8	5.0	10.0
37	TOTAL COMPLETE MARKET	96.3	97.6	99.1	84.7	98.8	43.2	80.8	100.0	92.6
38	RESIDUAL MARKET	3.7	2.4	0.9	15.3	1.2	56.8	19.2		7.4
39	TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
40	TOTAL DOMESTIC	90.1	86.9	80.6	86.5	97.4	93.6	91.2	95.0	90.0

Defining Market Quotients

Market quotient equations link detailed product data to an input-output model. As described above, the quotient measures the share of a product's sales in the total sales of its market. In an INSPEX, an indicator of the product's market based on input-output coefficients is used to measure the size of the market. These Dynamic Coefficient Indicators (DCI) increase the flexibility of the market quotient approach by expanding the definition of a market.

To construct the market quotients for the plastics model, Dynamic Coefficient Indicators for the SPI markets must be constructed. The first step in constructing a DCI for an SPI market is to determine which INFORUM sectors correspond to the market. Since both the SPI markets and the INFORUM markets are defined in terms of the Standard Industrial Classification (SIC) coding scheme, a common link between the two specifications exists. Some of the links are easily established. For example, the SPI market Motor vehicles and parts corresponds to four sectors from INFORUM's Detailed Output Model (DOM):

DOM Sector # 382 Truck and bus bodies
383 Truck trailers
384 Motor vehicles
385 Motor Vehicles parts & accessories.

Some of the SPI markets do not link easily with INFORUM sectors. The Packaging market, for example, overlaps many different sectors of the economy, and is therefore not uniquely identified in the input-output framework. To construct a DCI for packaging markets, two approaches were taken. The first was to simply match the SIC codes of the SPI definitions and the INFORUM sectors. For instance, the SPI market Flexible packaging

is identified as corresponding to SIC codes 2600, Paper, and 3079, Miscellaneous plastic products. The DCI for Flexible packaging is therefore defined as the plastics-weighted sum of the following DOM sectors:

DOM Sector #	147	Paper mill, excl bldng paper
	148	Paperboard mills
	150	Sanitary paper products
	153	Bags, except textiles
	210	Misc. plastic products

In other instances, identifying the SIC-coding match did not generate much information about the market. For example, Bottles, Jars, & vials was identified only as part of Miscellaneous plastic products. An alternate approach is to identify sectors that purchase plastic (based on input-output coefficients), and then determine which of those use plastic bottles, jars, and vials. The components for the DCI for Bottles are therefore:

DOM Sector #	181	Agricultural chemicals
	182	Gum and wood chemicals
	187	Chemical preparation, NEC
	192	Drugs
	193	Soap and other detergents
	194	Polishes and sanitation

The DCI for Food packaging was constructed in a similar manner. According to input-output data, different food sectors, such as Ice cream, Pickles, Meat, and Spaghetti, purchase plastic inputs. We assume that those plastic inputs are not part of the production process, but rather are purchased for packaging purposes. The DCI for the Food packaging market is the plastics-weighted sum of detailed food sectors in the DOM model.

Some of the SPI markets link more closely to final demand sectors of the INFORUM models than to producing sectors. For instance, the SPI market Building and construction links to investment in Structures. In the INFORUM LIFT model, structures investment is calculated for thirty different industries. The DCI's for construction markets were therefore linked to these thirty industries. The SPI market for Pipe, conduit & fittings, for example, links to construction of Mining, Gas & petroleum pipes, and Sewer systems. Likewise, some of the SPI markets for Consumer & institutional products link to personal consumption categories. Since INFORUM identifies PCE by 78 different products, links between detailed SPI markets and INFORUM sectors were easily obtained. The SPI market for Dinnerware, tableware, & kitchenware links to PCE of China, glassware and dinnerware, for example.

After choosing which INFORUM sectors will define each SPI market, appropriate weights for creating the market indicators must be chosen. The simplest way of creating market indicators is to add the output of the relevant sectors for each SPI market. A more accurate indicator of the market for plastics can be generated by considering the demand for plastic by the different sectors. For instance, the total Transportation market is composed of the activities of different sectors of the DOM model, such as Motor vehicles and Trucks. The Transportation market for plastics is determined by the demand for plastic by each of the individual sectors. Weighting the output of the relevant sectors by their plastics demand creates specifically defined indicators of plastics markets.

Since SPI markets are linked to intermediate demand and to final demand categories, two types of weights are needed. Most of the markets

are defined in terms of producing sectors, or intermediate demand. The weights in these cases answer the question: how much plastic is used per dollar of output of the sector? Input-output coefficients exactly answer that question. The INFORUM models are based on input-output tables published by the Bureau of Economic Analysis. The most recently published BEA table is for 1977. INFORUM projects that table to 1982 by incorporating published data on manufacturing shipments, final demand sales, and other National and Income Product Accounts data.[8] INFORUM updates both the 78-product table for the LIFT model, as well as the 420-order table that is the basis for DOM.

Since some of the SPI markets linked more closely to final demand categories than to producing sectors, final demand weights must also be defined. The INFORUM model calculates investment in structures for 31 different industries, for example. In the LIFT model, a 78x31 bridge matrix is used to describe the product composition of structures investment. The row of the bridge table for the plastics industry shows how much plastic was used as structures investment by each of 31 different industries. Those row coefficients are the appropriate weights for defining plastic demand by structures investment. A similar bridge exists for describing the product composition of personal consumption expenditures. The plastics row of the PCE bridge matrix contains the appropriate final-demand weights for PCE sectors.

An incontrovertible economic truth is that changes in technology, prices, and tastes lead to changes in input requirements and production

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[8] See McCarthy (1986) for detailed descriptions of the extensive work done to make as up-to-date tables as possible.

relationships over time. At one time, only toy cars were made primarily out of plastic, and milk came packaged only in glass bottles or paper cartons. For the most part, changes in input requirements occur slowly, as production technology responds to the changing economic environment. Accounting for these changes is an important part of accurately measuring specific product markets. The INFORUM models do not assume that input requirements remain constant over time. The input-output coefficients in both the LIFT and DOM models are forecast using the "across-the-row coefficient change" method.[9]

The importance of using dynamic, rather than constant, measures of input requirements is illustrated in Figure 3.3. Coefficient indicators for two markets are shown: Transportation and Consumer and institutional products. In each case, a DCI of the market is compared to a Constant Coefficient Indicator (CCI) based on a 1982 weight. In both instances, the CCI understates the size of the plastics market over the forecast horizon, and overstates the historical size of the market (compared to the DCI definition of the market). The differences will consequently affect the historical market quotient definitions for each resin series, as well as the individual forecasts.

Once the DCI's are defined, the market quotient for each available plastic series is constructed. The next step in the INSPEX procedure is to forecast these quotients.

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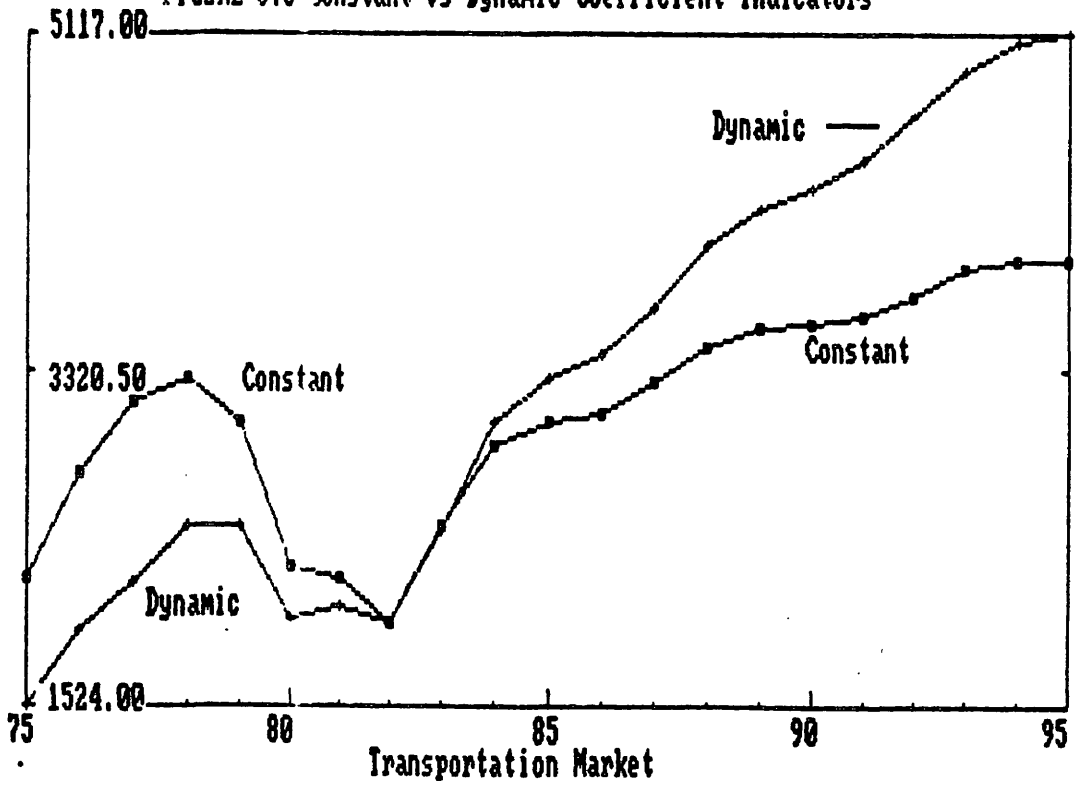
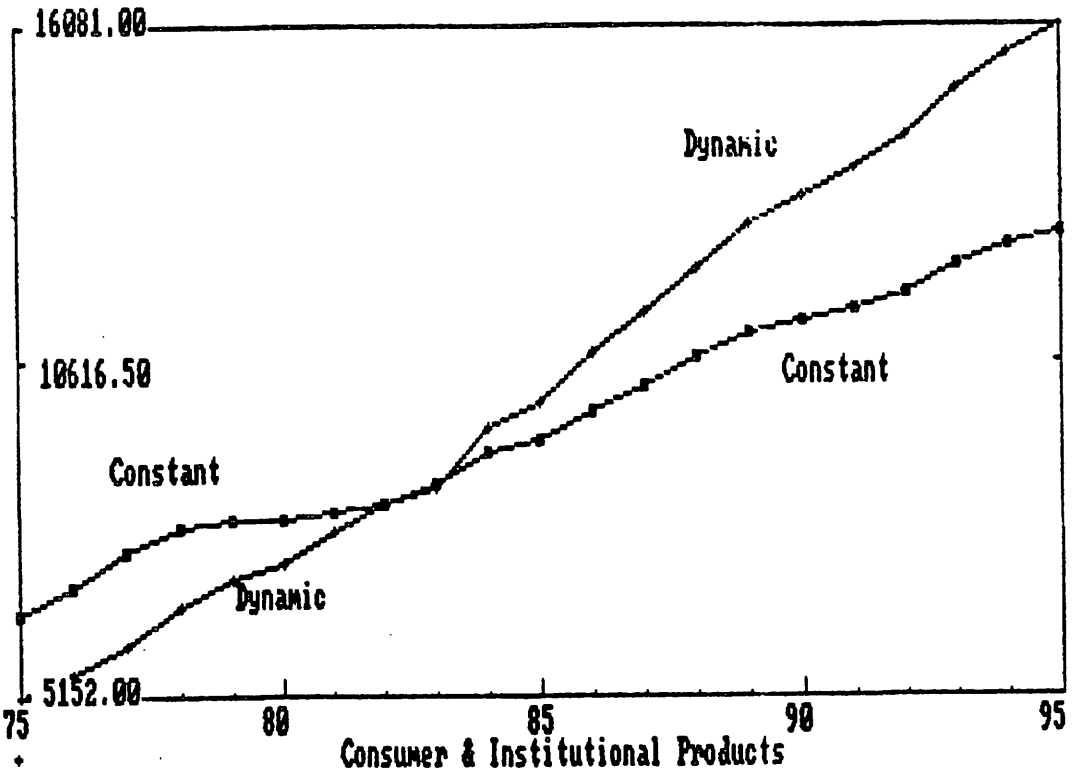
[9] See Almon et al., pp. 157-163. The coefficients are forecast outside the model and therefore do not respond to economic conditions in the model. An attempt at incorporating such response is described in Taylor (1981).

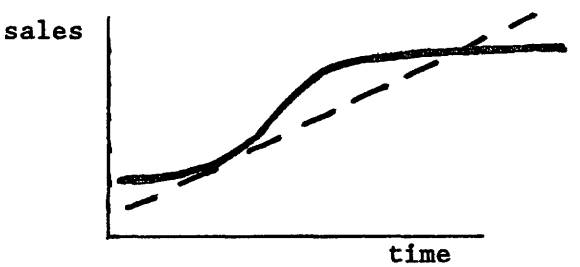
FIGURE 3.3 Constant vs Dynamic Coefficient Indicators





Forecasting Market Quotients

Since SPI data on plastic sales exists for 1975-1986, an eleven-year time-series of each market quotient is available. A simple method for forecasting these quotients is to determine any trend in the quotients over the historical period and then project that trend. An early version of the IMP model used linear time trends to forecast the market quotients.[10] Linear trends are inappropriate, however, for capturing the trends measured by market quotients. A sample quotient is illustrated below. Initially, sales to the market grow slowly, and the market quotient is relatively flat. Eventually the quotient grows more rapidly, as the product expands its share of the total market. Finally, the quotient flattens out again, as sales to the market level off. The quotient follows an S-shaped pattern. Although the example shows a series that is increasing over time, a similar non-linear trend exists for series that are declining. Clearly, a linear trend (the dashed line) is inappropriate for capturing the trends in the series.



In order to measure the non-linear trends in the market quotients, the quotients were estimated with logistic curves. A logistic curve measures the speed with which a series approaches an asymptote. The

[10] See Sullivan (1983).

differential equation for a logistic curve is

$$\frac{1}{q}\frac{dq}{dt} = b(a - q) \qquad (7)$$

where q = market quotient,
a = asymptote the quotient series is approaching,
b = constant ratio of the percentage change in q to the gap between a and q.

The solution of this differential equation is

$$q(t) = \frac{a}{1 + Ae^{-bat}} \qquad (8)$$

where A = a constant of integration.[11]

The constant of integration, A, represents the starting value of the quotient, while b measures the rate at which the series is approaching its asymptotic value, a. In order to estimate the non-linear functional form, the following algorithm is used.

1. Make a first guess at the asymptote.
2. Use Ordinary Least Squares (OLS) to estimate the linear equation:

$$\log\left(\left|\frac{a}{q(t)} - 1\right|\right) = \hat{a}1 + \hat{a}2(\text{time}) \qquad (9)$$

where a1 = log(A),
a2 = -ba (from equations 7 and 8).

[11] See Kmenta (1986) pp. 513-514, and Almon et al. (1974) p. 157.

3. Calculate R^2 from step 2. If R^2 is greater than r-squared from previous guess, adjust guess of asymptote and go to step 2. If R^2 is lower than previous guess, retrieve last guess and go to step 4.
4. Use OLS coefficients from equation with the highest R^2 to calculate:

$$A = \text{constant of integration} = e^{a1},$$
$$b = \text{rate of growth coefficient} = -\frac{a2}{a}.$$

This algorithm searches for the optimal value of the asymptote based on the r-squared from the linear approximation of the logistic curve. The results from the logistic curve estimations are shown in Table 3.7. (The table appears at the end of this section, in order to maintain the flow of the text.) The first columns contain the mean value of the market quotient over the historical period, followed by a sign indicating whether the market quotient series is increasing or decreasing over time. The next three columns display the estimation parameters for the logistic curve equation: the constant of integration, the rate of growth coefficient, and the asymptote. The next column shows the R^2 statistic that measures the goodness of fit of the logistic curve to the actual market quotient series. (This is not the R^2 of the linear approximation.) The final columns describe the plastic series (the numerator of the market quotient). These columns show the average sales over the historical period, whether the series is increasing or decreasing, and the R^2 measuring the accuracy of the logistic-curve estimates of the quotients in predicting the plastics sales.

As discussed above, one of the advantages of the market quotient approach is the ability to identify the sources of growth for plastics

sales. Sales may be growing because the overall market is expanding, because the market quotient is increasing, or some combination of those two factors. The results in Table 3.7 show that approximately one-third of the plastics series exhibit increasing sales, even though their market quotients are decreasing. Rapid expansion of the total market for these series overcomes the negative effect of the decreasing quotient. Since none of the markets, as measured by the DCI's, are decreasing, no series' increasing market quotient is over-ridden by a decreasing market.

As expected when using a linear approximation of a non-linear function, the average R^2 statistic is low. In most cases, however, the R^2 for the sales series is higher than for the quotient. Since the goal of the market quotient equation is to predict final sales, the higher R^2 is encouraging. In some instances, the R^2 values are negative: the sum of squared residuals from the predicted values is greater than the sum of squared deviations from the mean. In other words, a prediction based on the mean value of the quotient would do better than the prediction based on the regression equation parameters. Less than one-fifth of the total number of equations have negative R^2's, and all of these are series whose market quotients are decreasing and approaching a zero asymptote. Although the equations might improve by letting the asymptote be negative, the asymptote is constrained to be greater than or equal to zero for practical purposes.

In a few cases, the forecasts generated by the market quotient equations were patently unreasonable. In those instances, it was necessary to override the results of the equation and specify the market quotient directly. Out of the 150 equations, only two were overridden: ABS&SAN

sales to Motor vehicles and Polystyrene sales to Food containers. These are identified as "fixed" series in the table.

At this point, the two ingredients for generating a forecast of plastics have been computed. The LIFT and DOM models forecast the plastics markets as measured by the DCI's. In addition, the market quotients are projected based on the logistic curve estimations. Finally, the individual pieces must be combined to forecast the detailed sales of the individual resin series.

Forecasts with the Plastics INSPEX

What is the long-run outlook for the sales of High density polyethylene? Which thermoplastic resin has the most optimistic outlook, or the most pessimistic, for the next five years? The Interindustry Model for Plastics was constructed in order to answer such questions. An IMP forecast shows not only which resin will grow most rapidly over the forecast horizon, but also the reasons for that growth. Identifying the causes for a particular forecast is a feature of an INSPEX that makes it a useful analytical tool for a business economist. The economist can inform business planners about areas they can control, such as market penetration, and areas that are out of their control, such as the overall size of the Transportation market.

Outlook for the economy

Since an INSPEX is linked to a parent model that describes the general economy, the first step in forecasting with the INSPEX is to determine the outlook for the economy as a whole. This outlook then will determine the outlook for the DCI's that measure the markets for individual plastics. The parent model for the IMP INSPEX is INFORUM's LIFT model. The forecast described here, and summarized in Table 3.8, is the INFORUM June 1987 forecast.[12]

TABLE 3.8 LIFT Outlook

	Exponential Annual Growth Rates		
	1986-1991	1991-1996	1996-2000
Gross National Product	2.4	1.8	1.9
Personal Consumption	1.7	1.7	1.4
Resid Structures	1.9	1.7	1.4
Non-resid Structures	1.4	2.9	3.0
Equip Investment	2.3	2.5	3.4
Merchandise Exports	5.9	4.1	4.7
Merchandise Imports	-1.5	1.7	1.6
Government Purchases	0.3	0.5	0.5
Inflation			
GNP deflator	3.1	4.7	4.5
PCE deflator	3.4	4.6	4.7
Labor Force (BLS projection)	1.5	1.0	1.2
Money supply (M2 - INFORUM assumption)	7.0	6.7	6.5

	Annual Levels			
	1986	1991	1996	2000
Unemployment Rate	7.0	6.5	4.7	3.9
Savings Rate	3.8	5.1	6.7	8.2
10-year Bond Rate	7.7	7.6	7.9	6.8
3-month Bill Rate	6.0	4.6	5.1	4.7

[12] See the June 1987 INFORUM Report for more details about the forecast, the data, and the assumptions in the model.

The INFORUM macroeconomic forecast shows a strong response by the economy to the depreciation of the dollar from 1987-1991. The fall in the dollar spurs growth in import-competing industries, as well as in exports. Exports grow by almost six percent per year to 1991, and imports fall by one and a half percent per year. The effects of the fall in the dollar spur economic growth through the early 1990's. As those effects diminish, overall growth slows. Higher import prices lead to slightly higher inflation, and growth in residential construction and exports slows. In the long-run period, from 1996-2000, projected growth in the size of the labor force helps the economy boost growth slightly.

The LIFT model specifies the outlook for 78 different producing sectors of the economy. In order to expand that product detail, the LIFT forecast is linked to the 420-sector DOM model. The DOM model determines the outlook for the more detailed sectors of the economy, based on the LIFT forecast. These detailed product sectors make up the DCI's that determine the markets for the specific plastic resins of the plastics INSPEX.

Outlook for plastics markets

The optimistic outlook for the macroeconomy is felt by most markets for plastics. Table 3.9 summarizes the forecasts for the SPI markets for plastics based on the outlook of the LIFT model. The fall in the dollar spurs growth in import-competing industries, such as electronics and transportation. In addition, the lower dollar boosts growth in exporting industries. As demand for machinery exports increases, for example, the demand for plastic by the Industrial/Machinery market expands as well.

TABLE 3.9 Outook for Plastics Markets

Dynamic Coefficient Indicators September 1987
Interindustry Model for Plastics

Annual Growth Rates

	75-85	85-86	86-87	87-88	88-89	89-90	90-92	92-95	95-100	87-100
Transpor	7.6	4.1	7.2	8.4	5.0	2.6	4.1	3.1	2.8	3.7
Motor	7.8	2.9	7.9	8.4	5.2	2.7	4.2	3.1	2.8	3.7
Packagin	5.2	3.9	6.8	5.8	4.3	3.1	3.4	3.1	2.4	3.2
Bottle	5.4	5.1	7.9	6.5	4.8	3.2	3.5	3.3	2.3	3.3
Food C	4.5	2.6	6.1	4.7	3.8	2.9	3.1	2.7	2.1	2.8
Flexib	7.0	5.7	6.3	6.0	4.1	3.1	3.5	3.3	2.6	3.3
Other	6.3	4.7	8.9	8.9	5.7	4.1	4.5	4.1	3.5	4.4
Building	7.5	4.0	3.8	3.6	4.4	3.9	3.7	3.5	3.1	3.5
Pipe,	4.9	-7.1	2.3	6.5	4.1	2.8	4.5	2.1	2.7	3.2
Materl	7.7	4.6	3.8	3.2	4.4	4.0	3.5	3.6	3.1	3.5
Other	8.9	10.2	6.6	6.2	4.4	3.8	4.2	3.2	3.1	3.7
Electric	9.6	2.2	11.1	15.4	8.1	2.9	4.6	5.8	5.0	6.0
Applia	8.4	3.6	12.5	12.8	8.2	3.3	5.4	6.5	5.7	6.4
Commun	9.4	4.2	6.4	14.1	5.1	0.8	2.7	4.3	3.3	4.2
IndEqu	10.9	-0.4	12.9	18.8	10.0	3.9	5.0	6.1	5.1	6.7
Furnitur	5.4	9.7	7.0	6.7	4.7	2.6	3.4	3.2	2.7	3.4
Furnit	5.5	11.6	6.7	6.6	5.1	3.0	3.8	3.5	3.0	3.7
Carpet	5.1	6.6	7.3	6.8	4.1	2.0	2.7	2.6	2.1	2.8
Consumer	6.5	7.6	6.2	6.1	5.6	3.4	3.6	4.0	3.3	3.9
Dinner	3.2	7.9	2.5	3.1	3.0	1.0	1.9	2.3	2.0	2.2
Health	8.8	8.4	7.8	7.1	6.6	4.4	4.2	5.1	4.4	4.9
Toys,	7.0	8.2	11.6	10.4	7.0	4.1	4.4	4.6	3.7	4.8
Other	6.4	6.9	5.3	5.5	5.4	3.3	3.4	3.6	2.7	3.5
Industrl	6.6	6.0	10.2	9.5	9.6	2.7	3.5	4.9	4.0	4.9
Adhesive	7.9	4.8	8.9	8.5	6.0	3.8	4.0	3.9	3.5	4.3
Reseller	10.9	2.5	9.1	9.8	6.0	3.1	3.7	4.0	3.5	4.3
Unclassf	10.9	2.5	9.1	9.8	6.0	3.1	3.7	4.0	3.5	4.3
Exports	7.6	3.4	13.9	19.5	8.8	1.7	2.7	4.6	4.7	5.6
Total	10.9	2.5	9.1	9.8	6.0	3.1	3.7	4.0	3.5	4.3
GNP	2.8	2.4	3.3	3.8	2.6	1.4	1.7	2.0	1.8	2.0
Plastic (LIFT)	9.1	5.5	8.7	9.3	5.7	3.1	3.4	3.8	3.5	4.2

The growth in plastics markets follows the overall growth pattern of the macroeconomic forecast. As the effects of the lower dollar diminish, by 1991, plastics markets grow more slowly. In the last years of the forecast horizon, the overall expansion in the economy is once again felt by plastics markets. One of the most robust markets through the year 2000 is Electronics, especially the Industrial equipment sub-market, with annual growth rates of 6% and 6.7% respectively. The Export market grows strongly throughout the forecast period, 5.6% per year, as does the market for Industrial/Machinery, 4.9% per year. Some of the slowest growing markets are Food container packaging, 2.8% per year, Dinner and kitchenware products, 2.2%, and Carpets and textiles, 2.8%. Food packaging relies heavily on growth of food sales, which are relatively stable over time. Dinnerware and Carpets are relatively income-sensitive sectors, and are therefore hurt by the fall in income in the 1989-1992 period of the forecast.

Outlook for thermoplastic resins

The short-run outlook for most plastic resins reflects the overall expansion in the economy due to the depreciation of the dollar. Table 3.10 below summarizes the forecast for the sales of each thermoplastic resin to the Total Domestic market. Some of the fastest growing resins in the near term are Nylon (12.4% growth from 1987-1988) and High density polyethylene (9.2%). The optimistic outlook for these resins can be traced to the outlook for their markets, as well as to the outlook for their market quotients. Nylon, for example, sells more than forty percent of its total sales to the Transportation market, and close to twenty percent to

the Electronics market. (See Table 3.5.) In the 1987-1998 period, those markets lead the list of fast-growing markets for plastics. In addition, the results in Table 3.7 indicate that most of the market quotients for Nylon are increasing. An exception is the quotient for sales to the Electronics market. The robust growth of Electronics is sufficient, however, to overcome the negative effects of the market quotient.

High density polyethylene sells fifty percent of its total sales to the Packaging market. Since the Packaging market is forecast to grow modestly from 1987-1888, it is the robust market quotients that determine the optimistic outlook for HDPE.

The importance of the dual effects of the market quotient and the market forecasts in determining the outlook for any resin is illustrated in Figure 3.4. The first chart in Figure 3.4 shows the robust forecast for the Electronics market, based on the INFORUM DOM model and the Dynamic Coefficient Indicators used by the plastics INSPEX. In the second chart, the market quotient for sales of Nylon to Electronics is shown. The quotient has been falling over time, and its forecast is approaching an asymptote close to zero. The final chart illustrates the optimistic outlook for Nylon sales to Electronics. In spite of a declining market quotient, Nylon sales benefit from fast growth in Electronics.[13]

Table 3.11 summarizes the forecast for all resins to the Total Domestic market. (Similar tables for each market appear at the end of this paper). The first section of the table shows the actual sales, in millions of pounds, of each resin to the Total Domestic market.

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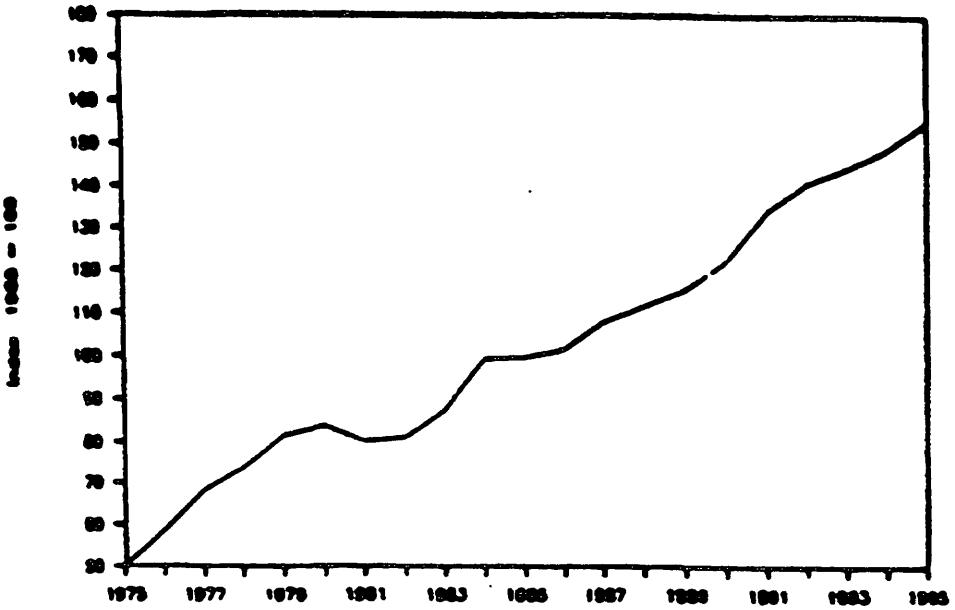
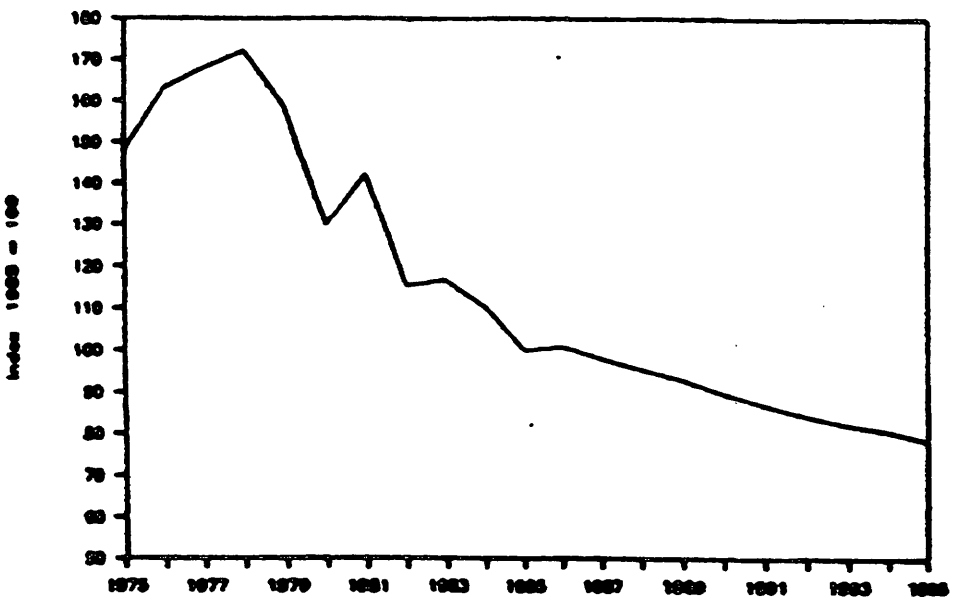
[13] See Sullivan (1987) for illustrations of all the forecast series.

.THOUGH THE MARKET IS GROWING STRONGLY . . .



OUTPUT OF THE ELECTRONICS MARKET

A-RESIN's MARKET SHARE IS FALLING . . .



SALES OF A-RESIN PER UNIT OF ELECTRONICS

SO, SALES OF A-RESIN TO THE ELECTRONICS MARKET ARE FLAT.

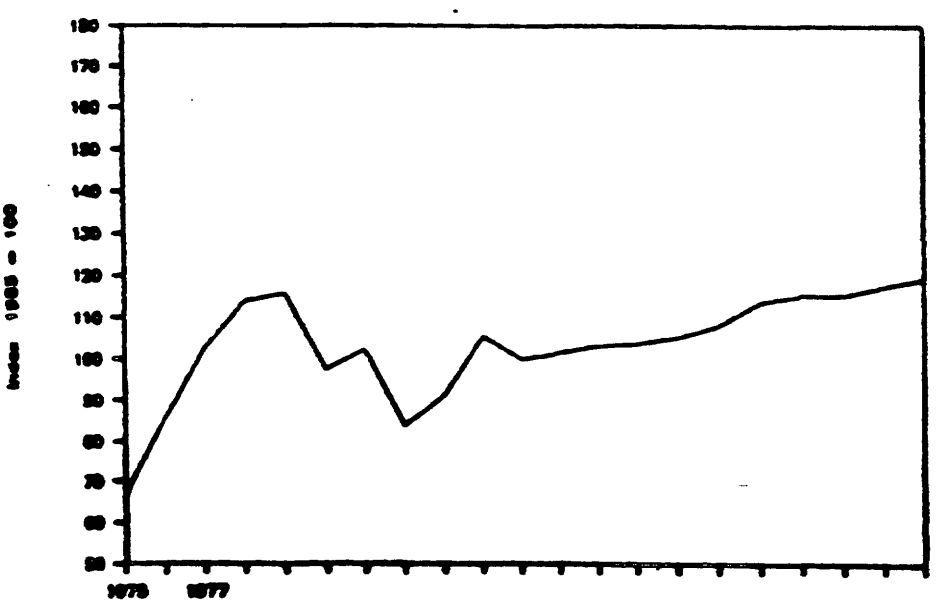


TABLE 3.10 Resin Sales to Domestic Market

Sales to the Total Domstic Market

Annual Growth Rates

	75-86	86-87	87-88	88-90	90-92	92-95	95-100	87-100
LDPE	6.4	5.8	4.7	2.5	2.0	2.5	1.9	2.4
HDPE	9.2	9.2	9.2	6.3	5.9	5.5	4.5	5.6
POLYPROP	9.1	8.6	9.3	5.5	5.1	4.9	4.1	5.1
ABS SAN	2.6	3.3	6.7	1.3	1.6	2.1	2.1	2.2
POLYSTYR	5.1	0.5	4.7	1.7	2.7	2.9	2.4	2.6
SBL OSBL	6.4	-2.2	4.5	0.1	2.8	2.8	2.3	2.4
NYLON	10.3	10.9	12.4	6.4	5.9	5.6	4.9	6.0
PVC	6.5	1.3	6.8	3.8	5.3	4.1	4.1	4.4
OTHER	4.5	39.3	15.7	10.7	5.4	6.0	5.6	7.2
TOTAL	6.7	7.9	7.7	4.6	4.3	4.2	3.7	4.4
GNP	2.7	3.3	3.8	2.0	1.7	2.0	1.8	2.0

TABLE 3.11 Forecast Results by Plastics Market

9/2/87 DCI update with fixes THERMOPLASTIC RESINS SOLD TO THE TOTAL DOMESTIC (TOT - EX) MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	8143	5774	4400	951	4024	1025	379	6428	4476	35600	0	35600
1986	8484	6090	4682	1007	4340	1071	403	7027	2623	35731	0	35731
1987	8987	6675	5101	1042	4363	1048	449	7116	3886	38670	0	38670
1988	9416	7316	5600	1114	4572	1096	508	7613	4547	41786	0	41786
1989	9733	7863	5986	1146	4698	1113	552	7973	5140	44204	0	44204
1990	9902	8306	6250	1143	4733	1099	579	8218	5627	45856	0	45856
1991	10053	8768	6537	1149	4834	1124	608	8566	5899	47535	0	47535
1992	10312	9345	6917	1180	4995	1163	652	9129	6272	49964	0	49964
1993	10700	9998	7372	1225	5196	1217	703	9601	6744	52755	0	52755
1994	10969	10565	7745	1251	5351	1249	743	10017	7164	55056	0	55056
1995	11114	11024	8022	1258	5443	1265	770	10316	7511	56726	0	56726
1996	11260	11478	8293	1266	5532	1281	800	10659	7850	58423	0	58423
1997	11569	12114	8722	1305	5701	1326	852	11361	8357	61314	0	61314
1998	11734	12619	9059	1327	5833	1354	888	11738	8822	63386	0	63386
1999	12062	13292	9522	1377	6019	1397	951	12219	9413	66271	0	66271
2000	12219	13789	9857	1395	6143	1423	982	12640	9916	68390	0	68390
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	22.87	16.22	12.36	2.67	11.30	2.88	1.06	18.06	12.57	100.00	0.00	100
1986	23.74	17.05	13.11	2.82	12.15	3.00	1.13	19.67	7.34	100.00	0.00	100
1987	23.24	17.26	13.19	2.69	11.28	2.71	1.16	18.40	10.05	100.00	0.00	100
1988	22.53	17.51	13.40	2.67	10.94	2.62	1.22	18.22	10.88	100.00	0.00	100
1989	22.02	17.79	13.54	2.59	10.63	2.52	1.25	18.04	11.63	100.00	0.00	100
1990	21.59	18.11	13.63	2.49	10.32	2.40	1.26	17.92	12.27	100.00	0.00	100
1991	21.15	18.45	13.75	2.42	10.17	2.36	1.28	18.02	12.41	100.00	0.00	100
1992	20.64	18.70	13.84	2.36	10.00	2.33	1.30	18.27	12.55	100.00	0.00	100
1993	20.28	18.95	13.97	2.32	9.85	2.31	1.33	18.20	12.79	100.00	0.00	100
1994	19.92	19.19	14.07	2.27	9.72	2.27	1.35	18.20	13.01	100.00	0.00	100
1995	19.59	19.43	14.14	2.22	9.60	2.23	1.36	18.19	13.24	100.00	0.00	100
1996	19.27	19.65	14.19	2.17	9.47	2.19	1.37	18.25	13.44	100.00	0.00	100
1997	18.87	19.76	14.23	2.13	9.30	2.16	1.39	18.53	13.63	100.00	0.00	100
1998	18.51	19.91	14.29	2.09	9.20	2.14	1.40	18.52	13.92	100.00	0.00	100
1999	18.20	20.06	14.37	2.08	9.08	2.11	1.43	18.44	14.21	100.00	0.00	100
2000	17.87	20.16	14.41	2.04	8.98	2.08	1.44	18.48	14.50	100.00	0.00	100
INDEX 1986 = 1.00												
1985	0.96	0.95	0.94	0.94	0.93	0.96	0.94	0.91	1.71	1.00	0.00	1.00
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
1987	1.06	1.10	1.09	1.03	1.01	0.98	1.12	1.01	1.48	1.08	0.00	1.08
1988	1.11	1.20	1.20	1.11	1.05	1.02	1.26	1.08	1.73	1.17	0.00	1.17
1989	1.15	1.29	1.28	1.14	1.08	1.04	1.37	1.13	1.96	1.24	0.00	1.24
1990	1.17	1.36	1.33	1.13	1.09	1.03	1.44	1.17	2.14	1.28	0.00	1.28
1991	1.18	1.44	1.40	1.14	1.11	1.05	1.51	1.22	2.25	1.33	0.00	1.33
1992	1.22	1.53	1.48	1.17	1.15	1.09	1.62	1.30	2.39	1.40	0.00	1.40
1993	1.26	1.64	1.57	1.22	1.20	1.14	1.75	1.37	2.57	1.48	0.00	1.48
1994	1.29	1.73	1.65	1.24	1.23	1.17	1.84	1.43	2.73	1.54	0.00	1.54
1995	1.31	1.81	1.71	1.25	1.25	1.18	1.91	1.47	2.86	1.59	0.00	1.59
1996	1.33	1.88	1.77	1.26	1.27	1.20	1.99	1.52	2.99	1.64	0.00	1.64
1997	1.36	1.99	1.86	1.30	1.31	1.24	2.11	1.62	3.19	1.72	0.00	1.72
1998	1.38	2.07	1.93	1.32	1.34	1.26	2.20	1.67	3.36	1.77	0.00	1.77
1999	1.42	2.18	2.03	1.37	1.39	1.30	2.36	1.74	3.59	1.85	0.00	1.85
2000	1.44	2.26	2.10	1.38	1.42	1.33	2.44	1.80	3.78	1.91	0.00	1.91

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

Two years of history, 1985 and 1986, appear on the table, in addition to the forecast of 1987-2000. The second section of the table describes the resin composition of sales to this market over time. Nylon sales, for instance, are only one percent of total thermoplastic sales, while each of the polyethylenes, LDPE and HDPE, is approximately twenty percent. In order to illustrate the relative growth of each of the resins, the final section of the table shows each resin series indexed to the last year of historical data. Nylon, HDPE, and Polypropylene, for instance, grow more quickly to 2000 than the Total sales, while LDPE and PVC grow more slowly.

Specific resin forecasts

Although space does not permit a detailed analysis of all 350 plastics forecasts, a brief summary of each resin's outlook follows.

Low density polyethylene (LDPE)

Since more than fifty percent of LDPE is sold as Flexible packaging, its overall outlook depends heavily on this market. Over most of the forecast horizon, Flexible packaging grows modestly. In addition, as shown in Table 3.7, the market quotient for LDPE to Flexible packaging has been declining over time. The estimated asymptote for the quotient is less than one percent of the mean historical value of the quotient. Given this conservative growth forecast, the overall outlook for LDPE is muted, with sales expected to grow by only 2.4% from 1987-2000.

High density polyethylene (HDPE)

In contrast to LDPE, High density polyethylene is one of the fastest-growing resins of all thermoplastics. Table 3.7 shows that most of the market quotients for HDPE are increasing, notably the quotients for Packaging, Transportation, Exports, Construction, and Other consumer products. Of the quotients that are declining, three are for markets that comprise only one percent of HDPE's total sales: Dinnerware, Toys, and Health. The quotient for sales to Electronics also declines, but as noted above, the robust growth of Electronics overcomes slow market quotient growth. Finally, HDPE benefits from the depreciation of the dollar, which spurs growth in exports. (Exports are close to fifteen percent of HDPE's total sales.)

Polypropylene (PROPYL)

Polypropylene enjoys an optimistic outlook over the forecast horizon, thanks both to growth in its major markets, and to growth in its market quotients. Polypropylene's sales are evenly distributed among several markets. Packaging, Furniture, Exports, and Consumer products each comprise close to one-fifth of total sales. The forecast of rising market quotients, coupled with optimistic market outlooks, buoys overall growth of Polypropylene. The market quotients for Electronics and Transportation are declining, but each of these markets is less than five percent of total sales. Declining quotients for some of the sub-markets for Consumer products (Dinnerware, Toys, Other) are outweighed by the optimistic quotient for the largest sub-market in that group, Health and medical products.

Acrylonitrile-butadiene-styrene and Styrene-acrylonitrile
ABS and SAN

The ABS and SAN resins have one of the bleakest outlooks of all the thermoplastics resins, with growth of just 2.2% from 1987-2000. In total, they comprise just two percent of total thermoplastic sales, and that share is forecast to decline. ABS and SAN are not widely used, and sales to only eight markets qualified as 'complete' series for the IMP model. The quotients for most of those markets, Transportation, Packaging, and Electrical are declining. Strong growth in those markets, and in Exports, drives the modest growth in ABS and SAN.

Polystyrene (STYREN)

The relatively somber forecast for Polystyrene reflects its struggling history. Of the sixteen market quotient series for Styrene, only three of them have been increasing over time: Flexible packaging, Dinnerware, and Unclassified sales. The market quotients for some of Polystyrene's largest markets, such as All other packaging, Materials for structures, and Electrical are declining. Further, almost half of the detailed market sales have been decreasing over the historical period as well. Total domestic sales are forecast to grow by only 2.6% over the forecast horizon. Unlike the plastics discussed above, Polystyrene's market quotient for exports is declining, so that Polystyrene does not reap the direct benefits of the depreciation of the dollar.

Styrene based latexes, Other styrene based polymers (SBL, OSBL)

Of all the thermoplastics in the SPI Major Market Survey, SBL and OSBL were the least well-reported. Less than half of total sales were documented in complete series. The forecast for SBL,OSBL therefore depends largely on the forecast for its one major market, Furniture. As with ABS&SAN and Polystyrene, SBL&OSBL does not enjoy an optimistic forecast. A declining market quotient forecast for its Furniture market, coupled with a modest outlook for Furniture, results in an overall growth rate of just 2.4% over the 1987-2000 forecast.

Nylon

As discussed above, Nylon's optimistic outlook is due to the robust forecast for its markets, Transportation, Electrical, and Furniture, as well as to positive growth in most of its market quotients.

Polyvinyl chloride (PVC)

Since most of PVC's sales are to the Construction market (60%), PVC's sales are more volatile than other thermoplastics. For instance, in Table 3.9, PVC sales grew at an annual rate of 6.5% from 1975-1986, only 1.3% from 1986-1987, and are forecast to grow 6.8% from 1987-1988. The macroeconomic forecast shows slow growth in Non-residential structures until 1991, followed by more optimistic growth over the long-run forecast horizon. PVC sales follow this general pattern, with growth of less than four percent predicted until 1990. After 1991, PVC sales stabilize somewhat, reflecting the consistent growth forecast for Structures investment in the macroeconomic outlook.

Accuracy of IMP Forecasts

One way to evaluate an INSPEX such as the Interindustry Model for Plastics is to measure its forecasting accuracy. In the following section, a year-ahead forecast using IMP is compared to actual data for that year. The results are favorable and indicate the advantages of using an INSPEX system to model detailed product data.

In Table 3.12, an IMP forecast for 1986 is compared to actual data for 1986 from the Society of the Plastics Industry. The forecast is based on the IMP model whose data base consisted of SPI data from 1975-1985. The macroeconomic forecast reflects the INFORUM Summer 1987 outlook described above in Table 3.8.

In general, the results are gratifying. The three most significant resins, LDPE, HDPE, and Polypropylene, were among the resins forecast with the greatest accuracy. The largest percent miss was 10% for SBL&OSBL, which is one of the smallest resins. Overall, the forecast for the total series was off by less than three percent.

Table 3.12

Accuracy of IMP Forecast - 1986

Resin	% of total	Actual	Forecast	Miss	%(ofActual)*100
LDPE	25.63	8484	8497	-13	-0.153
HDPE	18.39	6090	6099	- 9	-0.148
Polyprop	14.14	4682	4588	94	2.010
ABS,SAN	3.04	1007	985	22	0.020
Polystyr	13.11	4340	4114	226	5.210
SBL,OSBL	3.23	1071	963	108	10.080
Nylon	1.22	403	400	3	0.740
PVC	21.22	7027	6573	454	6.460
TOTAL	100.00	33108	32222	886	2.680

Although IMP's forecasting accuracy is impressive, its real strength is its flexibility in analysing the outlook for plastics under different economic scenarios. In the next section, the INSPEX is used to analyze the effects of changes in market quotients and markets on plastics sales.

Simulations with the Plastics INSPEX

The two-stage structure of the plastics INSPEX (market quotients plus markets) creates a powerful simulation tool for analysing the plastics industry. First, the INSPEX can analyze changes in plastics markets. The LIFT model forecasts the effect of different economic scenarios on the markets for resins. For instance, LIFT can answer the question: what effect will lower oil prices have on the overall economy, and on the markets for plastics in particular? The market-quotient forecasts of the plastics model then determine the effect of lower oil prices on the sales of Polypropylene to the Automobile market, and HDPE to the Food packaging market. In addition, the plastics model can answer specific questions about a plastic's market quotient. If more plastic is being used per unit of output of Motor vehicles, for instance, how will Nylon's future sales be affected?

In the following sections, two simulations are done with the IMP model. The first simulation considers the effect of changing the definition of the market Coefficient Indicators. Dynamic Coefficient Indicators are replaced by Coefficient Indicators based on constant weights over time. Changing the market definitions implies that the market forecasts and the market quotient estimations differ in this scenario. The next simulation considers a change only in the market forecasts for plastics. The INFORUM system of models is used to analyze the effect of different oil prices on the demand for plastics. The oil-price simulation begins by using INFORUM's international system of models to forecast the world-wide effect of lower oil prices. The world-wide outlook includes the LIFT model, which generates a consistent forecast for the U.S. economy.

The 78-sector detail of the LIFT model is then expanded to the 420-sector detail of DOM. Finally, the detailed sectoral forecasts from LIFT and DOM are used by IMP to forecast the effect of different oil prices on the markets for plastics.

Constant vs Dynamic Coefficient Indicators

One of the determinants of the outlook for plastics is the forecast of the plastics markets. In defining the markets used in the plastics INSPEX, INFORUM sectors are weighted by their plastic demand, as captured by input-output data. Instead of using simple base-year weights to define the markets, an INSPEX uses available historical data, as well as forecasts, to construct Dynamic Coefficient Indicators. How important are those dynamic weights in determining the outlook for plastics? Or, how will the markets change if the weights used to create the markets differ? In order to address such questions, this section compares a forecast for plastics based on Dynamic Coefficient Indicators to a forecast based on Constant Coefficient Indicators.

In order to construct Constant Coefficient Indicators (CCI's), a base-year weight was applied to INFORUM's sectoral forecasts, as shown in equation (5') below. Instead of using input-output coefficients for each year of data, the outputs are weighted by the coefficient for one year. The base year of the INFORUM input-output system, 1982, was chosen as the base for the CCI's.

$$CCI_j(t) = \sum_{k=1}^{M} a(i,k)(1982) \ * \ (\text{output of } k)(t) \quad (5')$$

where

M = the number of markets in the input-output model that correspond to the specific market,

a(i,k) = the input-output coefficient for the detailed product (i), used to produce one unit of k.

Since the input-output coefficients are increasing over time, the 1982-based CCI's predict larger markets from 1975-1982 than do DCI's. Likewise, the CCI's predict smaller markets for plastics in the future than DCI's, since CCI's do not consider the increasing input demand for plastic. Figure 3.3 above illustrates the difference between CCIs and DCIs in determining plastics markets.

Table 3.13 compares the market forecasts based on dynamic and constant coefficients. It is important to note that the macroeconomic outlook, as illustrated by Gross National Product, is the same for both cases. The only difference between the two outlooks is the definition of the coefficient weights. As expected, the DCI's indicate more robust market growth than do the CCI's. Food container packaging, for instance, grows only 1.2% per year from 1987-2000 when the 1982 weight is used, and 2.8% when the changing use of plastics in Food packaging is considered. Some of the other markets affected strongly are Motor vehicles, Communications equipment, and Consumer and institutional products. Some of the markets are not based on weights and so are not changed at all. These include the markets for Resellers, Unclassified sales, and Exports. Resellers and Unclassified are linked with total plastic sales, and

Exports are linked to plastics exports as defined in the LIFT model.

The more robust market predictions of the DCI's suggest that all resin sales will likewise be more robust. The different definitions of the markets affect more than just the market forecasts, however, since they also change the market definitions over the period of estimation of the quotients. The next important consideration in determining the effects of constant coefficients is the change in the market quotients over the historical period, and that subsequent influence on the quotient forecasts.

TABLE 3.13 CCI's vs DCI's
Annual Growth Rates of Market Indicators

	1975-1986		1986-1995		1995-2000		1986-2000	
	cci	dci	cci	dci	cci	dci	cci	dci
Transport	3.1	7.3	2.6	4.5	1.7	2.8	2.3	3.9
Motor Veh	3.2	7.4	2.7	4.6	1.7	2.8	2.4	4.0
Packaging	1.8	5.1	2.1	4.0	1.3	2.4	1.8	3.4
Bottles,	1.7	5.3	2.5	4.4	1.2	2.3	2.0	3.6
Food cont	1.2	4.3	1.6	3.5	1.0	2.1	1.4	3.0
Flexible	3.1	6.9	2.1	4.0	1.5	2.6	1.9	3.5
Other pack	3.8	6.2	3.5	5.5	2.4	3.5	3.1	4.8
Building,Const	4.1	7.2	2.0	3.7	2.1	3.1	2.0	3.5
Pipe, cond	1.2	3.8	1.7	3.4	1.3	2.7	1.5	3.2
Materials	4.3	7.4	2.0	3.7	2.2	3.1	2.1	3.5
Other build	4.4	9.0	2.4	4.4	2.0	3.1	2.3	3.9
Electrical	6.3	8.9	5.2	7.2	3.8	5.0	4.7	6.4
Appliances	5.9	8.0	5.6	7.5	4.6	5.7	5.2	6.8
Communic	7.1	8.9	3.0	4.9	2.1	3.3	2.7	4.3
Industrial	6.2	9.9	6.3	8.2	4.0	5.1	5.5	7.1
Furniture	3.5	5.8	2.2	4.2	1.6	2.7	2.0	3.6
Furniture	3.9	6.1	2.5	4.4	1.9	3.0	2.3	3.9
Carpets	3.0	5.2	1.8	3.7	1.0	2.1	1.5	3.2
Consumer,Inst	3.7	6.6	2.8	4.5	2.3	3.3	2.6	4.1
Dinnerware	3.5	3.7	2.0	2.3	1.8	2.0	1.9	2.2
Health,med	5.3	8.7	3.6	5.5	3.2	4.4	3.5	5.1
Toys,sports	3.5	7.1	4.3	6.2	2.6	3.7	3.7	5.3
Other consm	2.9	6.4	2.2	4.1	1.6	2.7	2.0	3.6
Industrial	2.5	6.5	4.1	6.0	2.9	4.0	3.6	5.3
Adhesives,inks	4.0	7.6	3.3	5.2	2.4	3.5	3.0	4.6
Resellers,comp	8.3	10.1	5.3	5.3	3.5	3.5	4.6	4.6
Unclassified	8.3	10.1	5.3	5.3	3.5	3.5	4.6	4.6
Exports	7.2	7.2	7.0	7.0	4.7	4.7	6.2	6.2
GNP	2.7	2.7	2.3	2.3	1.8	1.8	2.1	2.1

In general, the DCI's grow more quickly over the historical period than do the CCI's. Since the market indicators are the denominators of the market quotients, the DCI-quotients will grow more slowly over that period than will the CCI-quotients. The logistic curve based on the DCI-quotient is more pessimistic than the CCI-quotient. For instance, in Figure 3.5, the market quotient for LDPE sales to Flexible packaging is illustrated based on the DCI and the CCI market definitions. Over the historical period, the DCI-based quotient is larger than the CCI-quotient, but it is also falling at a greater rate. That pattern is reflected in the forecast of the quotients, with the CCI-based quotient forecast to remain relatively flat, and the DCI-based coefficient falling throughout the forecast. In this case, the increasing sales of LDPE to Flexible packaging are partly accounted for by the increasing input demand for plastics over that period.

Figure 3.5 CCI-Quotient vs DCI-Quotient

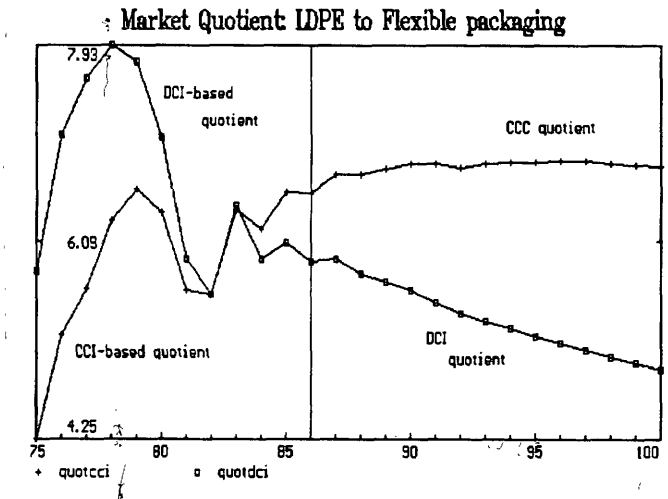


TABLE 3.14
Comparison of DCI vs CCI Forecast

Sales to the Total Domestic Market
Annual Growth Rates

		75-86	86-87	87-88	88-90	90-92	92-95	95-100	86-100
LDPE	cci	6.4	5.2	4.4	2.4	2.0	2.6	2.1	2.6
	dci	6.4	5.8	4.7	2.5	2.0	2.5	1.9	2.6
HDPE	cci	9.2	8.1	8.8	6.0	5.5	5.1	4.0	5.4
	dci	9.2	9.2	9.2	6.3	5.9	5.5	4.5	5.8
PROP	cci	9.1	9.0	7.2	5.3	4.5	4.4	3.7	4.8
	dci	9.1	8.6	9.3	5.5	5.1	4.9	4.1	5.3
ABS	cci	2.6	3.7	7.2	1.9	2.2	2.8	2.8	3.0
	dci	2.6	3.3	6.7	1.3	1.6	2.1	2.1	2.3
STYR	cci	5.1	-13.9	2.6	1.9	2.9	3.2	2.8	1.5
	dci	5.1	0.5	4.7	1.7	2.7	2.9	2.4	2.5
SBL	cci	6.4	-3.3	4.2	-0.0	3.0	3.1	3.0	2.2
	dci	6.4	-2.2	4.5	0.1	2.8	2.8	2.3	2.0
NYL	cci	10.3	11.6	13.0	7.0	6.2	5.7	4.6	6.5
	dci	10.3	10.9	12.4	6.5	5.9	5.6	4.9	6.4
PVC	cci	6.5	1.7	5.7	4.7	4.8	4.7	4.0	4.3
	dci	6.5	1.3	6.8	3.8	5.3	4.1	4.1	4.2
OTHR	cci	4.5	46.9	16.6	11.1	5.5	5.9	5.4	10.1
	dci	4.5	39.3	15.7	10.7	5.4	6.0	5.6	9.5
TOTL	cci	6.7	7.0	7.2	4.9	4.2	4.3	3.7	4.5
	dci	6.7	7.9	7.7	4.6	4.3	4.2	3.7	4.6

The forecast results summarized in Table 3.14 are mixed. In some cases, the stimulatory effect on the markets of using dynamic weights dominates, and resin sales are more optimistic using the DCI forecast. These resins include HDPE, Polypropylene, Polystyrene, and the Total resin. In other instances, the effect of the DCI's on the market quotients

overrides the robust growth of the markets, and resin sales grow more slowly with the DCI quotients than with the CCI quotients. These resins include LDPE, ABS&SAN, SBL&OSBP, Nylon, PVC, and Other thermoplastics.

Changing the weights used to define the market quotients makes a difference in the forecast for plastic resins. The differences arise because the weights affect the historical market quotients, as well as the forecasts of the potential markets. In the next simulation, changes are made to the model that affect only the future size of the markets, and not the market quotients.

Oil-price Simulations with the Plastics INSPEX

Since crude petroleum is used in producing plastics, most analysis of the effects of oil-price changes on plastics sales centers on the production side of the plastics industry. Another important aspect of oil-prices is their effect on overall demand conditions in the economy and specifically on the markets for plastics. In the following section, the INFORUM International System of models is used to simulate the effect of different oil prices on the world economy, and the United States in particular. The macroeconomic and industry results from the International System are then used with the Interindustry Model for Plastics to determine the effect of oil-price changes on the plastics industry.

The INFORUM LIFT model is part of a larger system of models that includes Interindustry Macroeconomic models for six other countries: Belgium, Canada, Japan, France, Italy, and W. Germany. In order to simulate a change in oil-prices and generate consistent results, it is necessary to use the International System of models. The International

System generates a set of world prices consistent with an assumed price of oil. These world prices are then used in the LIFT model to help determine U.S. exports and imports. If the oil-price assumption is changed only in the LIFT model, but not in the rest of the world, then the world prices used by LIFT will not be consistent with the U.S. model's price of oil. For instance, if the U.S. faces a lower price of oil than the rest of the world, U.S. prices would consequently be relatively lower than prices abroad. The lower relative prices would boost exports and decrease imports. Clearly, though, the U.S. would not be the only country to benefit from lower oil prices, so the changes in exports and imports in the U.S. would be overstated, leading to a misleading forecast of the effects of lower oil prices. Instead, the INFORUM International System of models allows a forecast that assumes all countries face the lower price of oil.

The INFORUM International System of Models was run using two different assumptions about the path of oil prices. The 'base' case lets oil prices increase moderately from 1986-1995, while the '10$' case assumes oil prices fall to ten dollars per barrel in 1986 and then rise with inflation to 1995. The oil price assumptions are summarized in Table 3.15.

TABLE 3.15 Oil-Price Assumptions

	1986		1990		1995	
	base	10$	base	10$	base	10$
Nominal Price $/bbl	16.00	10.00	20.00	11.16	24.50	13.75
Constant Price 1986 dollars	16.00	10.00	17.45	9.95	17.38	9.98

In general, the '10$' oil scenario has higher growth and lower inflation than the 'base' scenario. The macroeconomic results of the two scenarios are summarized in Table 3.16. Over the forecast horizon, 1986-1995, real Gross National Product grows at an annual rate of 2.42% with lower oil prices, compared to 2.36% in the base scenario. Lower oil prices decrease general inflation from 3.6% per year to 3.26%. Lower inflation, which prompts lower interest rates, helps boost personal consumption expenditures as well as investment. There is little change in exports and imports due to the oil-price difference. Imports grow somewhat more quickly in the '10$' oil scenario, because higher growth of the U.S. economy increases overall demand, including demand for imported goods.

TABLE 3.16
Summary of Macroeconomic Results for Oil-price Simulations

Ten Dollar Oil vs Base Oil Scenario: The Long Run

	10$	BASE
	(growth rates 1985-95)	
Higher growth		
GNP (1977$)	2.42	2.36
Disposable Income	1.94	1.83
Pers Consumption	2.55	2.47
Resid Construction	3.73	3.41
Equip Investment	2.78	2.54
Imports	2.18	2.09
Exports	4.39	4.41
Lower Inflation	3.26	3.60
	1995 level	
Lower Unemployment Rate	4.34	4.83
Lower Interest Rates		
3-month T-Bill	3.37	4.40
10-year Treas Bond	6.11	6.58

Ten Dollar Oil vs Base Oil Scenario: A Closer Look

	10$	BASE	10$	BASE
	1985-1990 growth rates		1990-1995	
Higher Growth				
GNP (77$)	2.66	2.58	2.20	2.13
Disp Income	2.17	2.08	1.71	1.57
Pers Consum	2.99	2.92	2.10	2.02
Res Constru	5.96	5.07	1.54	1.75
Equip Invest	1.86	1.67	3.66	3.40
Lower Infl	2.44	3.07	4.06	4.12
	1985 level		1990 level	
Lower Unemployment	7.21		6.31	6.61
Lower Interest Rates				
3-month T-Bill	7.48		3.62	5.07
10-year Treas Bond	10.62		5.72	6.57

A closer look at the pattern of growth over the forecast horizon shows that the higher growth from the '10$' oil scenario occurs largely in the first part of the forecast. Lower oil prices lead to lower inflation and higher growth, especially in investment and construction, from 1985-1990. From 1990-1995, growth in investment slows, while growth in real income continues to grow steadily. In the long run, 1990-1995, higher real demand leads to faster growth in personal consumption expenditures, but also in imports.

The effect of the macroeconomic results of the oil-price simulations on plastics' markets is summarized in Table 3.17. In general, the markets reflect the pattern of faster growth from lower oil prices through 1990, followed by a period of tempered growth over the remainder of the forecast horizon. The Transportation market, for example, grows at an annual rate of 2.9% from 1985-1990 in the base scenario, and at 3.3% with lower oil prices. Resins such as Nylon for instance, which sells 40% of its total sales to Transportation, experience faster growth due to the market expansion. The Building and construction market is also stimulated by lower oil prices, growing at 4.4% per year in the '10$' scenario, compared to 4.1% in the base case. Although the lower oil prices stimulate personal consumption expenditures, some of the expansion in consumer goods leads to increases in imports, implying less of a stimulus to plastics from those markets. The market for Toys, sports

TABLE 3.17
Summary of Market Results for Oil-price Simulations

	1985-1990		1990-1992		1992-1995		1985-1995	
	10$	base	10$	base	10$	base	10$	base
Transportation	3.3	2.9	3.5	2.9	0.7	1.1	2.5	2.3
Motor Vehicl	2.7	2.2	3.1	2.6	-.0	0.3	2.0	1.7
Packaging	2.3	2.2	2.1	2.0	1.3	1.4	2.0	1.9
Bottles,jars	2.6	2.5	2.2	2.1	1.5	1.6	2.2	2.1
Food contain	1.9	1.8	1.7	1.5	1.1	1.1	1.6	1.5
Flexible	2.6	2.5	2.6	2.5	1.6	1.7	2.3	2.2
Other pack	3.2	3.1	3.4	3.2	1.9	2.1	2.9	2.8
Build & Const	4.4	4.1	3.4	3.3	1.9	2.2	3.5	3.4
Pipe,conduit	3.3	2.8	2.5	1.9	1.2	1.2	2.5	2.2
Materials	4.8	4.5	3.6	3.5	2.2	2.4	3.8	3.7
Other build	4.0	3.8	4.1	3.4	1.7	1.7	3.3	3.1
Elect/electron	4.0	4.2	7.1	6.7	3.3	3.4	4.4	4.5
Appliances	5.1	5.4	6.1	5.9	4.3	4.3	5.0	5.2
Commun equip	2.3	2.3	4.9	4.3	1.1	1.4	2.5	2.4
Indust equip	3.4	3.4	8.2	7.8	2.6	2.8	4.1	4.1
Furnit/furnish	1.8	2.4	4.2	3.8	1.4	1.6	2.1	2.4
Furniture	1.5	2.2	4.8	4.2	1.4	1.6	2.1	2.4
Carpets/text	2.2	3.2	3.3	4.1	1.4	2.1	2.2	3.0
Consum & Inst	2.6	3.3	3.5	3.4	1.9	2.0	2.6	2.9
Dinnerware	1.9	3.2	3.4	3.4	2.0	2.0	2.2	2.9
Health,med	2.3	2.1	3.5	3.3	2.2	2.2	2.5	2.4
Toys,sport	4.5	4.6	4.4	4.2	2.4	2.5	3.9	3.9
Other C&I	3.8	3.6	3.5	3.2	1.6	1.7	3.1	2.9
Indust/Machin	0.9	0.6	6.6	5.8	1.6	1.7	2.2	2.0
Adhesives,ink	2.1	2.0	2.4	2.2	0.9	1.0	1.8	1.7
Resellers/unc	3.2	3.1	4.2	3.8	1.8	1.9	2.9	2.9
Exports	5.7	5.5	5.8	5.6	2.4	2.7	4.7	4.7

and hobbies, for example, grows more slowly from 1985 to 1990 in the '10$' oil scenario, 4.4%, than in the base forecast, 4.5%. The overall expansion in the economy is felt eventually by the plastics market for this product, however, and the long-run growth over the forecast horizon is unchanged in the base and '10$' scenarios at 3.9%.

Since lower oil prices stimulate markets such as Transportation and Building and construction, resins that sell primarily to those markets will benefit from lower oil prices. (Table 3.18 summarizes the effect of the oil-price scenarios on plastics sales.) Nylon, for instance, sells mainly to Transportation, while PVC sells 60% of its total sales to Building and construction. These two resins consequently benefit most from lower oil prices. Nylon's growth increases from 4.6% to 4.9% for 1990-1992, for instance, while PVC's growth increases from 4.3% to 4.6%. Some resins do not experience faster growth due to lower oil prices. The Packaging market was largely unaffected by lower oil prices, for example. Since both High density and Low density polyethylene sell close to 50% of their total sales to Packaging, their outlook is not greatly changed by lower oil prices.

The long-run picture for most resins does not change dramatically due to the lower price of oil. As shown in Table 3.18, the long-run growth rates for most resins, from 1985-1995, differ only slightly between the '10$' and base scenarios. The pattern of growth over the long run, however, is different in the two scenarios. Both scenarios are characterized by moderate growth from 1985-1990 followed by an increase in growth from 1990-1992, and then a slow-down from 1992-1995. Most of the growth in the '10$' oil scenario occurs in the short and intermediate run

followed by slower growth in the last few years of the forecast horizon. The base scenario, on the other hand, experiences a smoother growth pattern over the entire forecast period.

TABLE 3.18 SUMMARY OF OIL PRICE SCENARIO

Sales to the Total Domestic Market (annual growth rates)

	1985-1990		1990-1992		1992-1995		1985-1995	
	10$	base	10$	base	10$	base	10$	base
Low Density PE	0.9	0.9	2.9	2.6	1.3	1.5	1.4	1.4
High Density	4.1	4.1	5.4	5.2	3.5	3.6	4.2	4.2
Polypropylene	3.8	3.8	5.6	5.3	3.8	3.9	4.2	4.1
ABS and SAN	-1.4	-1.5	-0.0	-0.3	-1.7	-1.6	-1.2	-1.3
Polystyrene	-1.0	-1.1	1.8	1.6	-0.1	0.1	-0.2	-0.2
SBL,OSBL,OSBP	-2.2	-2.2	2.0	1.7	0.1	0.3	-0.6	-0.7
Nylon	2.5	2.4	4.9	4.6	2.8	3.0	3.1	3.0
PVC	4.4	4.0	4.6	4.3	3.5	3.6	4.2	4.0
Other	8.4	8.3	5.1	4.8	3.2	3.3	6.2	6.1
Total	2.8	2.7	3.9	3.6	2.2	2.3	2.8	2.8

Conclusions and suggestions for further work

A possible area for expanding an INSPEX is to include price-response in the determination of product demand. For example, if the price of plastic falls relative to the prices of materials that can be substituted for plastic, such as paper or glass, then demand for plastic should increase. Likewise, if plastic becomes relatively more expensive than its substitutes, due to increases in oil prices for example, demand for plastic will decrease. The market quotient equations that link detailed product data to market size could be modified to include such price effects.

The market quotient equations are forecast using a non-linear logistic curve that estimates an asymptote, or saturation point, for the quotient. As developed in this chapter, the INSPEX assumes that the asymptote is constant and does not change over the forecast horizon. An alternate approach is to include a price effect in the estimation procedure, so the asymptote shifts when relative prices change. For instance, if Low density polyethylene becomes less expensive than paper, we expect the saturation level for LDPE sales to packaging to shift up. The logistic curve specification would be modified as follows:

$$q(t) = \frac{a}{1 + Ae^{-bat}} \qquad (8')$$

where
- q = market quotient,
- a = asymptote the quotient series is approaching,
- b = constant ratio of the percentage change in q to the gap between a and q,
- A = constant of integration.

To include a price response, the asymptote equals:

$$a' = a(p^n) \tag{10}$$

where a' = price-sensitive asymptote,
p = relative price of plastic material to price of substitute materials,
n = price elasticity.

Given this modification to the logistic curve, and the requisite data on prices and elasticities, price effects can be included in an INSPEX.

As with many tasks, the success of economic modeling depends not only on wielding tools properly, but also in choosing a tool appropriate for the task at hand. The goal of this paper was to build a model using detailed industry data that would facilitate flexible analysis of the industry. The tool that was developed, an Industry-Specific Extension to an input-output model, provides an elegant solution to the problem. The INSPEX makes full use of detail provided by industry-specific data. It also provides a basis of completeness, not by developing its own elaborate picture of its economic environment, but by linking the detailed data to a larger, full-scale model of the economy. Although the overall structure of an INSPEX is not complex, it provides a powerful modeling tool. As illustrated with the Interindustry Model for Plastics, an INSPEX can be used both for simple forecasting, as well as for policy-oriented simulations. Its twofold structure allows specific policy simulations, and provides requisite detail for analysing forecast performance.

TABLE 3.7 Market Quotient Estimation Results

12/9/87 INFORUM December forecast Low density Polyethylene

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Bottles	0.0366	-	0.9964	0.0002	1.7743	0.2244	31.	+	-0.1070
Food Con	0.1480	+	1.3032	0.2635	0.3094	0.3355	328.	+	0.7168
Flexible	6.6600	-	0.9921	0.0576	0.0024	0.2224	3901.	+	0.8176
Pack Oth	1.1932	+	1.4223	1.8172	0.0945	0.6112	534.	+	0.7962
Pipe,Con	0.2181	-	0.9937	0.0016	0.1365	0.0809	42.	+	-0.1626
Material	0.0435	+	1.4631	0.1004	0.1760	0.0062	81.	+	0.1954
Bldg Oth	0.8185	+	1.4504	1.7477	0.0214	0.0543	97.	+	0.5699
Electric	0.0986	-	0.9961	0.0007	0.7774	0.7730	421.	+	0.4711
Ind Equp	0.2318	-	0.9959	0.0016	0.3265	0.7598	343.	+	0.1113
Kitchen	0.1665	-	0.9942	0.0013	0.2736	0.5086	208.	-	0.1749
Health	0.0474	-	0.9992	0.0001	3.0650	-1.3588	100.	+	-0.7289
Toys,Spr	0.1261	-	0.9993	0.0003	1.3941	0.6359	75.	-	0.2405
Cons Oth	0.0696	-	0.9971	0.0004	1.3063	0.7729	231.	-	0.2296
Reseller	0.1941	-	0.5831	0.1037	0.3913	0.6984	384.	+	0.8746
Unclass	0.0831	-	0.9949	0.0004	0.1803	-0.1730	169.	+	0.1722
Exports	0.6722	+	1.0565	1.3537	0.0048	0.0046	865.	+	0.7264

Mean quotient = average value of market quotient over estimation
Sign q = + for increasing quotient; - for decreasing
Const = constant of integration in the logistic curve equation:

$$q(t) = \frac{a}{1 + Ae^{-bat}}$$

Asymp = asymptote the series is approaching (a)
Growth b coef = change in growth of series (b in equation)
RSQ quotient = rsquare for fit of market quotient
Mean sale = average value of sales volume over estimation
Sign s = + for increasing sales; - for decreasing sales
RSQ sales = rsquare for fit of sales volume

12/9/87 INFORUM December forecas High density Polyethylene

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Transpor	0.0366	+	10.4765	0.1740	0.8305	0.8176	95.	+	0.9349
Bottles	1.0879	+	1.0162	2.1485	0.0030	0.0123	963.	+	0.8286
Food Con	0.2608	+	0.8529	0.3701	0.3464	0.3768	580.	+	0.7260
Flexible	0.3612	+	3.1991	0.6728	0.3142	0.7193	232.	+	0.8732
Pack Oth	1.1559	+	7.7209	4.8921	0.0254	0.8051	528.	+	0.8877
Building	0.1951	+	0.7421	0.3237	0.0613	0.0467	425.	+	0.6929
Pipe,Con	1.9459	+	0.7571	2.5721	0.0567	0.7215	391.	+	0.9140
Electric	0.0322	-	0.9948	0.0002	1.6474	0.2426	142.	+	0.3785
Kitchen	0.1191	-	0.9997	0.0003	1.5730	-3.3293	148.	-	-2.9494
Health	0.0148	-	0.9429	0.0011	2.8177	0.4420	32.	+	0.5602
Toys,Spr	0.1706	-	0.9971	0.0010	0.5592	0.7807	104.	-	0.2420
Cons Oth	0.0525	+	7.1472	0.2125	0.5732	0.5833	199.	+	0.7358
Reseller	0.2299	-	0.9953	0.0015	0.2292	0.3668	446.	+	0.5023
Unclass	0.0961	-	0.9965	0.0006	0.8445	0.5494	179.	+	0.2262
Exports	0.4659	+	2.5925	1.3206	0.0383	0.2726	607.	+	0.7082

12/9/87 INFORUM December forecas Polypropylene

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Transpor	0.1134	-	0.9964	0.0007	0.6780	0.6569	259.	-	0.2453
Bottles	0.0913	+	0.9156	0.1348	0.8572	0.3828	82.	+	0.7252
Food Con	0.0311	+	4.5402	0.0915	1.3947	0.2275	70.	+	0.4144
Flexible	0.4622	+	0.6481	0.6584	0.1084	0.3596	280.	+	0.8921
Pack Oth	0.6496	+	1.5984	1.2462	0.0682	0.3966	287.	+	0.7458
Electric	0.0507	-	0.9951	0.0003	0.8934	0.6566	221.	+	0.6127
Applianc	0.0563	-	0.6459	0.0254	1.1711	0.7034	98.	+	0.7845
Furn and	0.5527	+	1.4543	1.0178	0.0833	0.6175	792.	+	0.8902
Carpet	1.3786	+	1.1640	2.2828	0.0398	0.5652	753.	+	0.8615
Kitchen	0.0843	-	0.9954	0.0005	0.5244	-0.1529	106.	+	-0.3553
Health	0.0708	+	4.9560	0.2804	0.2616	0.4665	171.	+	0.8359
Toys,Spr	0.0756	-	0.9934	0.0006	0.3056	0.2583	48.	+	0.4211
Cons Oth	0.0533	-	0.9946	0.0003	0.3101	-0.0994	183.	+	-0.1338
Reseller	0.2287	+	1.5922	0.5303	0.0525	0.0957	479.	+	0.8269
Unclass	0.0613	+	1.6952	0.1102	1.0944	0.1084	132.	+	0.5730
Exports	0.4767	+	4.4445	1.7342	0.0440	0.6116	635.	+	0.8864

12/9/87 INFORUM December forecas ABS & SAN

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Transpor	0.1052	-	0.9944	0.0008	0.4450	0.6474	247.	+	0.7502
MotorVeh	--- Series is fixed ----								
Packagin	0.0065	-	1.0000	0.000976	.6422	-0.9479	25.	-	-1.3692
Building	0.1112	-	0.9997	0.0004	1.7306	-1.5694	221.	-	-1.4463
Electric	0.0555	-	0.9959	0.0004	1.3044	0.7747	237.	+	0.4227
Reseller	0.0397	+	1.8164	0.0961	0.3744	0.1201	84.	+	0.8669
Unclass	0.0233	-	0.9998	0.000010	.2590	-1.6644	45.	+	-0.8490
Exports	0.0640	+	5.9312	0.2438	0.4371	0.6279	86.	+	0.7924

12/9/87 INFORUM December forecas Polystyrene

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Bottles	0.1097	-	0.9960	0.0004	0.5568	-0.1522	96.	+	-0.1140
Food Con	--- Series is fixed ----								
Flexible	0.1440	+	2.4101	0.2518	0.7529	0.7568	91.	+	0.9030
Pack Oth	0.9456	-	0.8422	0.3317	0.1643	0.8364	389.	-	0.4882
Pipe,Con	0.0333	-	0.9972	0.0001	3.0628	0.0515	6.	-	-0.1806
Material	0.1456	-	0.9917	0.0012	0.0094	-0.0076	272.	+	0.8353
Bldg Oth	0.3608	-	0.9955	0.0017	0.1435	-0.0108	40.	-	-0.1021
Electric	0.0784	-	0.9967	0.0005	1.0824	0.8288	331.	+	0.2521
Applianc	0.1414	-	0.9944	0.0011	0.3398	0.7766	243.	+	0.7334
Furn and	0.0643	-	1.0003	0.0002	4.0523	-4.2870	83.	-	-3.9058
Kitchen	0.2987	+	2.6080	0.7714	0.0961	0.2343	388.	+	0.4527
Health	0.0361	-	0.9971	0.0002	2.3726	0.0465	76.	+	-0.1110
Toys,Spr	0.3641	-	0.9957	0.0025	0.1824	0.6682	228.	-	0.3776
Cons Oth	0.0450	-	0.9966	0.0002	0.6947	0.0473	155.	+	0.0418
Reseller	0.1911	-	0.9957	0.0011	0.2806	0.4669	370.	+	0.4220
Unclass	0.0875	+	1.2259	0.1848	0.0909	0.0063	179.	+	0.4884
Exports	0.1066	-	0.9983	0.0005	1.2295	0.6634	124.	-	0.2821

12/9/87 INFORUM December forecas SBL OSBL & OSBP

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Furn and	0.2096	-	0.7846	0.0504	0.1111	0.3964	292.	+	0.7029
Reseller	0.0115	-	0.9990	0.000014	.1870	-0.4874	23.	+	-0.4172
Unclass	0.0144	-	1.0000	0.000138	.0307	-0.6516	25.	-	-0.8635
Exports	0.0301	-	0.9985	0.0001	3.2349	-0.1575	37.	+	-0.1953

12/9/87 INFORUM December forecas Nylon

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Transpor	0.0428	+	3.8757	0.1440	0.5096	0.7843	106.	+	0.9649
Electric	0.0118	-	0.9932	0.0001	0.3299	0.0063	54.	+	0.8151
Ind/Mach	0.0955	+	3.4339	0.3357	0.1353	0.3351	24.	+	0.6799
Reseller	0.0086	+	1.3052	0.0193	0.5773	0.0011	18.	+	0.2455
Unclass	0.0061	-	1.0000	0.0000	105.95	-0.3729	10.	-	-0.7158
Exports	0.0174	-	0.9927	0.0001	-0.0430	-0.0547	22.	+	0.4115

12/9/87 INFORUM December forecas PVC

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Transpor	0.0851	-	0.9982	0.0004	1.4544	0.5055	192.	-	0.4358
MotorVeh	0.0906	-	0.9986	0.0004	1.5232	0.3620	178.	-	0.3347
Bottles	0.1211	+	4.1218	0.4111	0.1954	0.7736	111.	+	0.9360
Food Con	0.0117	+	5.1316	0.0337	4.1935	0.3282	27.	+	0.5371
Flexible	0.3668	-	0.9952	0.0022	0.1168	0.1680	211.	+	0.1555
Pack Oth	0.2827	-	0.8048	0.0910	0.4018	0.5132	118.	-	-0.3097
Pipe,Con	11.2618	+	3.425438	0.0440	0.0014	0.4773	2258.	+	0.7748
Material	0.3656	-	0.9918	0.0030	0.0009	-0.0099	682.	+	0.8754
Bldg Oth	1.4607	+	2.9442	4.1098	0.0159	0.1603	175.	+	0.6960
Applianc	0.0278	-	1.0003	0.0001	9.2041	-20.1673	44.	-	-14.0589
Communic	0.0663	-	0.9998	0.0002	2.7710	-2.8775	71.	+	-1.9450
Ind Equp	0.2815	-	0.9987	0.0011	0.4994	0.5924	400.	-	-0.1904
Furnitur	0.0482	+	7.6608	0.1533	1.1887	0.3649	45.	+	0.5548
Carpet	0.4112	-	0.9951	0.0026	0.1123	0.3672	216.	-	0.0117
Kitchen	0.0111	-	1.0000	0.000040	0.4335	0.5605	13.	-	0.5070
Health	0.0212	-	0.9927	0.0001	0.1541	-0.0458	47.	+	0.4695
Toys,Spr	0.0962	-	1.0000	0.0068	3.8249	0.4215	55.	-	0.0154
Cons Oth	0.0766	-	0.9985	0.0003	1.7035	0.2765	252.	-	-0.4051
Ind/Mach	0.1009	-	0.9961	0.0006	0.7314	0.3816	24.	-	-0.1161
Adhesive	0.1353	-	0.9979	0.0007	0.9972	0.7779	100.	-	0.4945
Reseller	0.1098	-	0.9960	0.0006	0.5551	0.5481	209.	+	0.3211
Unclass	0.0695	-	0.9942	0.0003	-0.1463	-0.1178	141.	+	0.3543
Exports	0.2790	-	0.9934	0.0019	0.0447	-0.0354	357.	+	0.4872

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Building	0.2198	-	0.9993	0.0003	0.7582	-1.2602	474.	+	-0.7353
Electric	0.0746	-	0.9965	0.0004	1.1051	0.5861	315.	+	0.0814
Furn and	0.0450	+	1.7802	0.0810	1.6718	0.2882	65.	+	0.3976
Consumer	0.0471	+	1.2058	0.0813	1.0417	0.1102	375.	+	0.2120
Ind/Mach	0.1932	-	0.9966	0.0010	0.4049	0.6551	46.	-	0.1253
Adhesive	1.1867	-	0.9980	0.0050	0.0927	-0.0353	930.	-	-0.1267
Reseller	0.0469	+	1.0729	0.0931	0.1428	-0.0001	97.	+	0.3854
Unclass	0.0261	-	0.9962	0.0001	-1.3571	-0.3399	51.	+	-0.3499
Exports	0.3166	+	0.8142	0.5690	0.0061	0.0008	407.	+	0.4730

Forecasts for: TOTAL Resin

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
Transpor	1.4235	+	0.3855	1.8230	0.0311	0.2489	1271.	+	0.7922
MotorVeh	2.9601	+	1.1487	4.3980	0.0320	0.8002	1177.	+	0.7196
Packagin	1.0607	+	0.1760	1.1989	0.0405	0.7813	10275.	+	0.9982
Bottles	1.2935	+	0.7265	1.6957	0.0847	0.7859	1694.	+	0.9661
Food Con	1.0251	-	0.0043	1.0000	-0.1053	-0.9089	1806.	+	0.9945
Flexible	1.0203	+	0.1274	1.1439	0.0073	0.0780	4813.	+	0.9971
Pack Oth	1.0568	-	0.0532	1.0005	0.0078	-0.0361	1962.	+	0.9954
Building	1.0097	+	1.0220	2.0315	0.0007	0.6049	4821.	+	0.9999
Pipe,Con	1.0996	-	0.1900	1.0008	0.1342	0.9402	2937.	+	0.9989
Material	1.3282	+	0.5488	1.8872	0.0249	0.1299	1384.	+	0.7551
Bldg Oth	1.6857	-	0.6363	1.0024	0.1024	0.3249	501.	+	0.5935
Electric	1.0122	+	0.4240	1.4361	0.0013	0.0556	2264.	+	0.9960
Applianc	1.8747	-	0.4891	1.0144	0.0103	0.4101	720.	+	0.9286
Communic	4.4571	-	0.9371	1.0133	0.0442	-0.1830	309.	-	0.0581
Ind Equp	1.6672	+	0.8483	2.3844	0.0461	0.8169	1236.	+	0.8854
Furn and	1.0435	+	1.0730	2.1343	0.0019	0.4608	1560.	+	0.9984
Consumer	1.0553	+	1.0572	2.1447	0.0017	0.5404	3373.	+	0.9974
Kitchen	1.0835	-	0.1661	1.0003	0.1493	0.2444	933.	+	0.9384
Health	1.1236	+	0.3209	1.4292	0.0184	0.4096	482.	+	0.9919
Toys,Spr	1.4138	+	1.1760	2.1349	0.0661	0.5651	705.	+	0.4179
Cons Oth	1.2325	+	0.4607	1.5830	0.0544	0.3162	1252.	+	0.5981
Ind/Mach	3.3110	+	0.8865	5.7244	0.0056	0.1067	306.	+	0.1818
Adhesive	1.4384	+	2.2840	4.0631	0.0083	0.3294	1443.	-	0.7444
Reseller	1.0000	-	0.0000	1.0000	0.0030	0.9067	2111.	+	1.0000
Unclass	1.0000	+	0.1000	1.1000	0.0000	0.9231	931.	+	1.0000
Exports	1.0000	+	0.1000	1.1000	0.0000	0.6667	3140.	+	1.0000
Total Av	1.0000	+	0.2007	1.2006	0.0001	0.2193	29547.	+	1.0000

Forecasts for: TOTAL Market

	Mean quotient	Sign q	Const	Asymp	Growth b coef	RSQ quotient	Mean sales	Sign s	RSQ sales
LDPE	1.0198	-	0.0222	1.0002	0.0423	0.0050	7611.	+	0.9963
HDPE	1.0249	+	0.1243	1.1426	0.0108	0.5196	4801.	+	0.9997
PROPYL	1.0183	-	0.0255	1.0002	0.0638	0.2957	3811.	+	0.9998
ABS SAN	1.1626	-	0.1418	1.0019	0.0089	-0.0317	1097.	+	0.9440
SBL OSBL	2.2042	+	1.6539	5.3807	0.0039	0.1575	833.	+	0.7299
NYLON	1.2877	-	0.2625	1.0043	0.0311	0.3896	298.	+	0.9864
PVC	1.0000	+	0.1002	1.1002	0.0000	0.1552	5749.	+	1.0000
OTHER	1.3503	+	2.6321	3.8863	0.0131	0.6173	3685.	+	0.9135
TOTAL	1.0651	+	1.0530	2.1595	0.0018	0.8573	31508.	+	0.9998

TABLE 3.19 Forecast Results by Plastics Market

9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE TRANSPORTATION MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	183	230	269	0	0	180	141	0	1003	429	1432
1986	0	232	237	285	0	0	192	149	0	1095	366	1461
1987	0	254	253	289	0	0	212	154	0	1164	530	1695
1988	0	296	265	303	0	0	239	159	0	1264	626	1891
1989	0	332	270	306	0	0	261	159	0	1330	711	2042
1990	0	362	268	302	0	0	278	156	0	1369	785	2154
1991	0	401	266	303	0	0	298	153	0	1422	832	2254
1992	0	450	268	309	0	0	326	153	0	1508	900	2408
1993	0	504	272	316	0	0	356	154	0	1603	975	2579
1994	0	547	270	316	0	0	379	152	0	1666	1032	2698
1995	0	582	263	311	0	0	396	147	0	1701	1073	2774
1996	0	621	259	308	0	0	417	144	0	1750	1122	2873
1997	0	676	262	314	0	0	450	144	0	1848	1204	3053
1998	0	713	258	311	0	0	471	141	0	1896	1255	3151
1999	0	776	263	319	0	0	509	143	0	2012	1353	3365
2000	0	807	258	315	0	0	529	140	0	2049	1398	3448
					AS PERCENT OF TOTAL FOR EACH YEAR							
1985	0.00	12.78	16.06	18.78	0.00	0.00	12.57	9.85	0.00	70.04	29.96	100
1986	0.00	15.87	16.21	19.50	0.00	0.00	13.13	10.19	0.00	74.91	25.09	100
1987	0.00	15.02	14.95	17.10	0.00	0.00	12.52	9.12	0.00	68.70	31.30	100
1988	0.00	15.66	14.05	16.03	0.00	0.00	12.68	8.43	0.00	66.85	33.15	100
1989	0.00	16.27	13.23	15.01	0.00	0.00	12.82	7.81	0.00	65.15	34.85	100
1990	0.00	16.83	12.47	14.06	0.00	0.00	12.93	7.26	0.00	63.55	36.45	100
1991	0.00	17.80	11.79	13.44	0.00	0.00	13.25	6.80	0.00	63.08	36.92	100
1992	0.00	18.71	11.16	12.84	0.00	0.00	13.55	6.38	0.00	62.64	37.36	100
1993	0.00	19.54	10.56	12.26	0.00	0.00	13.82	5.99	0.00	62.17	37.83	100
1994	0.00	20.30	10.01	11.72	0.00	0.00	14.07	5.63	0.00	61.74	38.26	100
1995	0.00	20.99	9.50	11.22	0.00	0.00	14.30	5.31	0.00	61.32	38.68	100
1996	0.00	21.61	9.03	10.74	0.00	0.00	14.53	5.01	0.00	60.93	39.07	100
1997	0.00	22.17	8.60	10.30	0.00	0.00	14.75	4.74	0.00	60.55	39.45	100
1998	0.00	22.64	8.19	9.88	0.00	0.00	14.95	4.50	0.00	60.16	39.84	100
1999	0.00	23.06	7.82	9.49	0.00	0.00	15.15	4.27	0.00	59.79	40.21	100
2000	0.00	23.41	7.48	9.13	0.00	0.00	15.34	4.07	0.00	59.44	40.56	100
					INDEX 1986 = 1.00							
1985	0.00	0.79	0.97	0.94	0.00	0.00	0.94	0.95	0.00	0.92	1.17	0.98
1986	0.00	1.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	1.10	1.07	1.02	0.00	0.00	1.11	1.04	0.00	1.06	1.45	1.16
1988	0.00	1.28	1.12	1.06	0.00	0.00	1.25	1.07	0.00	1.15	1.71	1.29
1989	0.00	1.43	1.14	1.08	0.00	0.00	1.36	1.07	0.00	1.21	1.94	1.40
1990	0.00	1.56	1.13	1.06	0.00	0.00	1.45	1.05	0.00	1.25	2.14	1.47
1991	0.00	1.73	1.12	1.06	0.00	0.00	1.56	1.03	0.00	1.30	2.27	1.54
1992	0.00	1.94	1.13	1.09	0.00	0.00	1.70	1.03	0.00	1.38	2.45	1.65
1993	0.00	2.17	1.15	1.11	0.00	0.00	1.86	1.04	0.00	1.46	2.66	1.76
1994	0.00	2.36	1.14	1.11	0.00	0.00	1.98	1.02	0.00	1.52	2.81	1.85
1995	0.00	2.51	1.11	1.09	0.00	0.00	2.07	0.99	0.00	1.55	2.93	1.90
1996	0.00	2.68	1.10	1.08	0.00	0.00	2.17	0.97	0.00	1.60	3.06	1.97
1997	0.00	2.92	1.11	1.10	0.00	0.00	2.35	0.97	0.00	1.69	3.28	2.09
1998	0.00	3.08	1.09	1.09	0.00	0.00	2.45	0.95	0.00	1.73	3.42	2.16
1999	0.00	3.34	1.11	1.12	0.00	0.00	2.66	0.96	0.00	1.84	3.69	2.30
2000	0.00	3.48	1.09	1.11	0.00	0.00	2.76	0.94	0.00	1.87	3.81	2.36

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE MOTOR VEHICLES AND PARTS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	0	260	0	0	0	124	0	384	959	1343
1986	0	0	0	274	0	0	0	131	0	405	955	1360
1987	0	0	0	291	0	0	0	136	0	427	1109	1537
1988	0	0	0	300	0	0	0	140	0	440	1193	1634
1989	0	0	0	306	0	0	0	140	0	446	1257	1703
1990	0	0	0	304	0	0	0	137	0	441	1287	1728
1991	0	0	0	303	0	0	0	134	0	437	1300	1737
1992	0	0	0	308	0	0	0	134	0	442	1337	1780
1993	0	0	0	312	0	0	0	135	0	447	1373	1820
1994	0	0	0	309	0	0	0	132	0	442	1375	1817
1995	0	0	0	300	0	0	0	128	0	428	1349	1777
1996	0	0	0	293	0	0	0	125	0	418	1332	1751
1997	0	0	0	293	0	0	0	126	0	419	1347	1766
1998	0	0	0	284	0	0	0	123	0	407	1321	1729
1999	0	0	0	285	0	0	0	125	0	410	1341	1751
2000	0	0	0	273	0	0	0	121	0	395	1301	1697

AS PERCENT OF TOTAL FOR EACH YEAR

1985	0.00	0.00	0.00	19.36	0.00	0.00	0.00	9.23	0.00	28.59	71.41	100
1986	0.00	0.00	0.00	20.14	0.00	0.00	0.00	9.63	0.00	29.77	70.23	100
1987	0.00	0.00	0.00	18.95	0.00	0.00	0.00	8.88	0.00	27.83	72.17	100
1988	0.00	0.00	0.00	18.38	0.00	0.00	0.00	8.58	0.00	26.96	73.04	100
1989	0.00	0.00	0.00	17.97	0.00	0.00	0.00	8.24	0.00	26.21	73.79	100
1990	0.00	0.00	0.00	17.59	0.00	0.00	0.00	7.95	0.00	25.55	74.45	100
1991	0.00	0.00	0.00	17.45	0.00	0.00	0.00	7.74	0.00	25.19	74.81	100
1992	0.00	0.00	0.00	17.30	0.00	0.00	0.00	7.57	0.00	24.87	75.13	100
1993	0.00	0.00	0.00	17.16	0.00	0.00	0.00	7.42	0.00	24.58	75.42	100
1994	0.00	0.00	0.00	17.02	0.00	0.00	0.00	7.31	0.00	24.33	75.67	100
1995	0.00	0.00	0.00	16.88	0.00	0.00	0.00	7.23	0.00	24.11	75.89	100
1996	0.00	0.00	0.00	16.74	0.00	0.00	0.00	7.17	0.00	23.91	76.09	100
1997	0.00	0.00	0.00	16.60	0.00	0.00	0.00	7.14	0.00	23.74	76.26	100
1998	0.00	0.00	0.00	16.45	0.00	0.00	0.00	7.13	0.00	23.58	76.42	100
1999	0.00	0.00	0.00	16.30	0.00	0.00	0.00	7.14	0.00	23.43	76.57	100
2000	0.00	0.00	0.00	16.13	0.00	0.00	0.00	7.17	0.00	23.30	76.70	100

INDEX 1986 = 1.00

1985	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.95	0.00	0.95	1.00	0.99
1986	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	0.00	0.00	1.06	0.00	0.00	0.00	1.04	0.00	1.06	1.16	1.13
1988	0.00	0.00	0.00	1.10	0.00	0.00	0.00	1.07	0.00	1.09	1.25	1.20
1989	0.00	0.00	0.00	1.12	0.00	0.00	0.00	1.07	0.00	1.10	1.32	1.25
1990	0.00	0.00	0.00	1.11	0.00	0.00	0.00	1.05	0.00	1.09	1.35	1.27
1991	0.00	0.00	0.00	1.11	0.00	0.00	0.00	1.03	0.00	1.08	1.36	1.28
1992	0.00	0.00	0.00	1.12	0.00	0.00	0.00	1.03	0.00	1.09	1.40	1.31
1993	0.00	0.00	0.00	1.14	0.00	0.00	0.00	1.03	0.00	1.11	1.44	1.34
1994	0.00	0.00	0.00	1.13	0.00	0.00	0.00	1.01	0.00	1.09	1.44	1.34
1995	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.98	0.00	1.06	1.41	1.31
1996	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.96	0.00	1.03	1.39	1.29
1997	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.96	0.00	1.04	1.41	1.30
1998	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.94	0.00	1.01	1.38	1.27
1999	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.95	0.00	1.01	1.40	1.29
2000	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.93	0.00	0.98	1.36	1.25

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE PACKAGING MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	5953	3355	1000	12	1292	0	0	572	0	12184	1027	13211
1986	6247	3560	1128	5	1360	0	0	497	0	12797	1089	13887
1987	6752	3937	1237	6	1441	0	0	580	0	13956	1260	15217
1988	7070	4336	1357	7	1515	0	0	633	0	14920	1420	16340
1989	7348	4675	1454	8	1569	0	0	677	0	15732	1556	17289
1990	7546	4966	1535	8	1606	0	0	716	0	16380	1673	18054
1991	7693	5273	1620	8	1647	0	0	744	0	16987	1785	18772
1992	7903	5638	1722	8	1699	0	0	778	0	17750	1918	19669
1993	8212	6036	1833	8	1754	0	0	818	0	18663	2078	20741
1994	8433	6397	1929	8	1798	0	0	852	0	19420	2222	21642
1995	8570	6699	2007	8	1828	0	0	878	0	19992	2350	22342
1996	8711	6999	2084	8	1859	0	0	903	0	20566	2471	23037
1997	8956	7377	2186	8	1904	0	0	938	0	21372	2622	23994
1998	9091	7696	2267	8	1934	0	0	965	0	21965	2772	24737
1999	9349	8103	2375	8	1982	0	0	1003	0	22822	2950	25772
2000	9487	8422	2454	8	2014	0	0	1031	0	23418	3112	26530

AS PERCENT OF TOTAL FOR EACH YEAR

1985	45.06	25.40	7.57	0.09	9.78	0.00	0.00	4.33	0.00	92.23	7.77	100
1986	44.99	25.63	8.12	0.04	9.79	0.00	0.00	3.58	0.00	92.15	7.85	100
1987	44.38	25.88	8.13	0.05	9.47	0.00	0.00	3.81	0.00	91.72	8.28	100
1988	43.27	26.54	8.31	0.05	9.28	0.00	0.00	3.87	0.00	91.31	8.69	100
1989	42.50	27.04	8.41	0.05	9.08	0.00	0.00	3.92	0.00	91.00	9.00	100
1990	41.80	27.51	8.50	0.05	8.90	0.00	0.00	3.97	0.00	90.73	9.27	100
1991	40.98	28.09	8.63	0.04	8.77	0.00	0.00	3.96	0.00	90.49	9.51	100
1992	40.18	28.67	8.75	0.04	8.64	0.00	0.00	3.96	0.00	90.25	9.75	100
1993	39.59	29.10	8.84	0.04	8.46	0.00	0.00	3.95	0.00	89.98	10.02	100
1994	38.97	29.56	8.92	0.04	8.31	0.00	0.00	3.94	0.00	89.73	10.27	100
1995	38.36	29.98	8.98	0.04	8.18	0.00	0.00	3.93	0.00	89.48	10.52	100
1996	37.81	30.38	9.05	0.04	8.07	0.00	0.00	3.92	0.00	89.27	10.73	100
1997	37.33	30.75	9.11	0.04	7.94	0.00	0.00	3.91	0.00	89.07	10.93	100
1998	36.75	31.11	9.16	0.04	7.82	0.00	0.00	3.90	0.00	88.79	11.21	100
1999	36.27	31.44	9.22	0.03	7.69	0.00	0.00	3.89	0.00	88.55	11.45	100
2000	35.76	31.74	9.25	0.03	7.59	0.00	0.00	3.89	0.00	88.27	11.73	100

INDEX 1986 = 1.00

1985	0.95	0.94	0.89	2.40	0.95	0.00	0.00	1.15	0.00	0.95	0.94	0.95
1986	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.08	1.11	1.10	1.38	1.06	0.00	0.00	1.17	0.00	1.09	1.16	1.10
1988	1.13	1.22	1.20	1.49	1.11	0.00	0.00	1.27	0.00	1.17	1.30	1.18
1989	1.18	1.31	1.29	1.59	1.15	0.00	0.00	1.36	0.00	1.23	1.43	1.24
1990	1.21	1.39	1.36	1.69	1.18	0.00	0.00	1.44	0.00	1.28	1.54	1.30
1991	1.23	1.48	1.44	1.69	1.21	0.00	0.00	1.50	0.00	1.33	1.64	1.35
1992	1.27	1.58	1.53	1.70	1.25	0.00	0.00	1.57	0.00	1.39	1.76	1.42
1993	1.31	1.70	1.63	1.72	1.29	0.00	0.00	1.65	0.00	1.46	1.91	1.49
1994	1.35	1.80	1.71	1.73	1.32	0.00	0.00	1.72	0.00	1.52	2.04	1.56
1995	1.37	1.88	1.78	1.73	1.34	0.00	0.00	1.77	0.00	1.56	2.16	1.61
1996	1.39	1.97	1.85	1.73	1.37	0.00	0.00	1.82	0.00	1.61	2.27	1.66
1997	1.43	2.07	1.94	1.75	1.40	0.00	0.00	1.89	0.00	1.67	2.41	1.73
1998	1.46	2.16	2.01	1.75	1.42	0.00	0.00	1.94	0.00	1.72	2.54	1.78
1999	1.50	2.28	2.11	1.78	1.46	0.00	0.00	2.02	0.00	1.78	2.71	1.86
2000	1.52	2.37	2.18	1.79	1.48	0.00	0.00	2.08	0.00	1.83	2.86	1.91

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE BOTTLES,JARS, AND VIALS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	19	1122	101	0	48	0	0	162	0	1452	686	2138
1986	60	1354	90	0	55	0	0	186	0	1745	950	2695
1987	43	1406	121	0	66	0	0	207	0	1846	998	2844
1988	39	1488	137	0	71	0	0	231	0	1969	1094	3063
1989	34	1548	153	0	75	0	0	253	0	2064	1171	3235
1990	29	1585	167	0	78	0	0	271	0	2131	1229	3360
1991	28	1638	174	0	78	0	0	292	0	2212	1308	3520
1992	28	1709	184	0	78	0	0	316	0	2317	1400	3718
1993	28	1790	194	0	80	0	0	343	0	2436	1502	3939
1994	28	1858	203	0	80	0	0	369	0	2540	1593	4133
1995	28	1905	209	0	80	0	0	391	0	2615	1666	4281
1996	28	1945	215	0	79	0	0	411	0	2681	1731	4412
1997	28	2005	223	0	79	0	0	437	0	2774	1812	4587
1998	27	2052	229	0	79	0	0	460	0	2849	1884	4733
1999	27	2117	237	0	79	0	0	487	0	2950	1971	4922
2000	27	2167	243	0	79	0	0	511	0	3029	2044	5073
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	0.92	52.46	4.72	0.00	2.24	0.00	0.00	7.58	0.00	67.92	32.08	100
1986	2.23	50.23	3.34	0.00	2.04	0.00	0.00	6.90	0.00	64.75	35.25	100
1987	1.54	49.43	4.26	0.00	2.35	0.00	0.00	7.30	0.00	64.89	35.11	100
1988	1.30	48.59	4.50	0.00	2.33	0.00	0.00	7.56	0.00	64.28	35.72	100
1989	1.08	47.84	4.74	0.00	2.32	0.00	0.00	7.82	0.00	63.80	36.20	100
1990	0.87	47.17	4.97	0.00	2.32	0.00	0.00	8.09	0.00	63.42	36.58	100
1991	0.82	46.55	4.96	0.00	2.22	0.00	0.00	8.30	0.00	62.84	37.16	100
1992	0.77	45.98	4.95	0.00	2.12	0.00	0.00	8.52	0.00	62.34	37.66	100
1993	0.73	45.44	4.93	0.00	2.03	0.00	0.00	8.72	0.00	61.86	38.14	100
1994	0.70	44.96	4.92	0.00	1.95	0.00	0.00	8.93	0.00	61.45	38.55	100
1995	0.67	44.50	4.90	0.00	1.88	0.00	0.00	9.13	0.00	61.08	38.92	100
1996	0.64	44.10	4.88	0.00	1.81	0.00	0.00	9.34	0.00	60.77	39.23	100
1997	0.61	43.73	4.87	0.00	1.74	0.00	0.00	9.54	0.00	60.48	39.52	100
1998	0.59	43.36	4.85	0.00	1.68	0.00	0.00	9.72	0.00	60.19	39.81	100
1999	0.57	43.02	4.82	0.00	1.62	0.00	0.00	9.91	0.00	59.95	40.05	100
2000	0.55	42.71	4.80	0.00	1.57	0.00	0.00	10.09	0.00	59.71	40.29	100
INDEX 1986 = 1.00												
1985	0.33	0.83	1.12	0.00	0.87	0.00	0.00	0.87	0.00	0.83	0.72	0.79
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.73	1.04	1.35	0.00	1.22	0.00	0.00	1.12	0.00	1.06	1.05	1.06
1988	0.66	1.10	1.53	0.00	1.30	0.00	0.00	1.24	0.00	1.13	1.15	1.14
1989	0.58	1.14	1.70	0.00	1.37	0.00	0.00	1.36	0.00	1.18	1.23	1.20
1990	0.48	1.17	1.86	0.00	1.42	0.00	0.00	1.46	0.00	1.22	1.29	1.25
1991	0.48	1.21	1.94	0.00	1.42	0.00	0.00	1.57	0.00	1.27	1.38	1.31
1992	0.48	1.26	2.04	0.00	1.44	0.00	0.00	1.70	0.00	1.33	1.47	1.38
1993	0.48	1.32	2.16	0.00	1.46	0.00	0.00	1.85	0.00	1.40	1.58	1.46
1994	0.48	1.37	2.26	0.00	1.47	0.00	0.00	1.98	0.00	1.46	1.68	1.53
1995	0.48	1.41	2.33	0.00	1.46	0.00	0.00	2.10	0.00	1.50	1.75	1.59
1996	0.47	1.44	2.39	0.00	1.45	0.00	0.00	2.21	0.00	1.54	1.82	1.64
1997	0.47	1.48	2.48	0.00	1.45	0.00	0.00	2.35	0.00	1.59	1.91	1.70
1998	0.46	1.52	2.55	0.00	1.44	0.00	0.00	2.47	0.00	1.63	1.98	1.76
1999	0.46	1.56	2.64	0.00	1.45	0.00	0.00	2.62	0.00	1.69	2.07	1.83
2000	0.46	1.60	2.71	0.00	1.45	0.00	0.00	2.75	0.00	1.74	2.15	1.88

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE FOOD CONTAINERS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	418	833	128	0	802	0	0	64	0	2245	17	2262
1986	548	787	224	0	794	0	0	40	0	2393	39	2433
1987	551	884	186	0	843	0	0	50	0	2516	40	2556
1988	571	951	187	0	884	0	0	57	0	2651	47	2699
1989	593	1012	187	0	918	0	0	63	0	2775	54	2829
1990	609	1064	185	0	945	0	0	70	0	2874	61	2936
1991	636	1108	199	0	973	0	0	76	0	2994	71	3066
1992	666	1158	215	0	1006	0	0	82	0	3128	84	3213
1993	701	1206	231	0	1038	0	0	88	0	3266	101	3368
1994	732	1249	245	0	1066	0	0	94	0	3389	120	3509
1995	760	1284	259	0	1089	0	0	99	0	3493	141	3634
1996	787	1318	272	0	1111	0	0	104	0	3594	165	3759
1997	818	1359	286	0	1139	0	0	109	0	3713	193	3906
1998	843	1390	298	0	1160	0	0	114	0	3808	226	4034
1999	875	1430	312	0	1188	0	0	119	0	3926	264	4191
2000	901	1462	324	0	1210	0	0	123	0	4023	306	4329

AS PERCENT OF TOTAL FOR EACH YEAR

1985	18.48	36.83	5.66	0.00	35.46	0.00	0.00	2.83	0.00	99.25	0.75	100
1986	22.54	32.35	9.21	0.00	32.63	0.00	0.00	1.64	0.00	98.37	1.63	100
1987	21.58	34.60	7.27	0.00	33.00	0.00	0.00	1.95	0.00	98.40	1.60	100
1988	21.17	35.25	6.96	0.00	32.75	0.00	0.00	2.11	0.00	98.24	1.76	100
1989	20.97	35.77	6.63	0.00	32.46	0.00	0.00	2.26	0.00	98.09	1.91	100
1990	20.76	36.25	6.31	0.00	32.19	0.00	0.00	2.40	0.00	97.92	2.08	100
1991	20.76	36.16	6.51	0.00	31.74	0.00	0.00	2.49	0.00	97.66	2.34	100
1992	20.75	36.04	6.70	0.00	31.31	0.00	0.00	2.56	0.00	97.37	2.63	100
1993	20.82	35.82	6.86	0.00	30.84	0.00	0.00	2.63	0.00	96.98	3.02	100
1994	20.88	35.60	7.01	0.00	30.40	0.00	0.00	2.68	0.00	96.57	3.43	100
1995	20.92	35.35	7.13	0.00	29.98	0.00	0.00	2.73	0.00	96.11	3.89	100
1996	20.94	35.08	7.25	0.00	29.57	0.00	0.00	2.78	0.00	95.61	4.39	100
1997	20.95	34.80	7.34	0.00	29.17	0.00	0.00	2.81	0.00	95.06	4.94	100
1998	20.92	34.47	7.41	0.00	28.76	0.00	0.00	2.83	0.00	94.40	5.60	100
1999	20.88	34.14	7.46	0.00	28.36	0.00	0.00	2.85	0.00	93.69	6.31	100
2000	20.81	33.78	7.50	0.00	27.96	0.00	0.00	2.86	0.00	92.91	7.09	100

INDEX 1986 = 1.00

1985	0.76	1.06	0.57	0.00	1.01	0.00	0.00	1.60	0.00	0.94	0.43	0.93
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.01	1.12	0.83	0.00	1.06	0.00	0.00	1.25	0.00	1.05	1.03	1.05
1988	1.04	1.21	0.84	0.00	1.11	0.00	0.00	1.42	0.00	1.11	1.20	1.11
1989	1.08	1.29	0.84	0.00	1.16	0.00	0.00	1.60	0.00	1.16	1.36	1.16
1990	1.11	1.35	0.83	0.00	1.19	0.00	0.00	1.76	0.00	1.20	1.54	1.21
1991	1.16	1.41	0.89	0.00	1.23	0.00	0.00	1.91	0.00	1.25	1.80	1.26
1992	1.22	1.47	0.96	0.00	1.27	0.00	0.00	2.06	0.00	1.31	2.13	1.32
1993	1.28	1.53	1.03	0.00	1.31	0.00	0.00	2.21	0.00	1.36	2.56	1.38
1994	1.34	1.59	1.10	0.00	1.34	0.00	0.00	2.36	0.00	1.42	3.03	1.44
1995	1.39	1.63	1.16	0.00	1.37	0.00	0.00	2.48	0.00	1.46	3.57	1.49
1996	1.44	1.68	1.22	0.00	1.40	0.00	0.00	2.61	0.00	1.50	4.16	1.55
1997	1.49	1.73	1.28	0.00	1.44	0.00	0.00	2.74	0.00	1.55	4.87	1.61
1998	1.54	1.77	1.33	0.00	1.46	0.00	0.00	2.86	0.00	1.59	5.70	1.66
1999	1.60	1.82	1.40	0.00	1.50	0.00	0.00	2.99	0.00	1.64	6.66	1.72
2000	1.64	1.86	1.45	0.00	1.52	0.00	0.00	3.10	0.00	1.68	7.74	1.78

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE FLEXIBLE PACKAGING MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	4791	402	419	0	148	0	0	218	0	5978	190	6168
1986	4926	437	379	0	150	0	0	191	0	6083	20	6104
1987	5265	492	443	0	177	0	0	224	0	6603	103	6706
1988	5452	542	486	0	198	0	0	238	0	6917	137	7055
1989	5611	583	523	0	215	0	0	248	0	7181	169	7351
1990	5712	617	555	0	230	0	0	257	0	7374	201	7575
1991	5774	649	580	0	241	0	0	258	0	7503	212	7715
1992	5882	685	609	0	255	0	0	261	0	7693	225	7919
1993	6069	724	644	0	269	0	0	265	0	7973	246	8220
1994	6186	756	671	0	281	0	0	267	0	8162	264	8427
1995	6240	779	692	0	290	0	0	266	0	8269	281	8550
1996	6297	802	714	0	299	0	0	265	0	8379	298	8678
1997	6433	834	745	0	311	0	0	268	0	8592	319	8912
1998	6482	855	766	0	319	0	0	267	0	8690	342	9033
1999	6622	887	798	0	331	0	0	270	0	8910	369	9279
2000	6678	908	820	0	339	0	0	269	0	9016	393	9410

AS PERCENT OF TOTAL FOR EACH YEAR

1985	77.68	6.52	6.79	0.00	2.40	0.00	0.00	3.53	0.00	96.92	3.08	100
1986	80.71	7.16	6.21	0.00	2.46	0.00	0.00	3.13	0.00	99.66	0.34	100
1987	78.51	7.34	6.61	0.00	2.65	0.00	0.00	3.35	0.00	98.46	1.54	100
1988	77.28	7.69	6.89	0.00	2.81	0.00	0.00	3.38	0.00	98.05	1.95	100
1989	76.33	7.94	7.12	0.00	2.93	0.00	0.00	3.39	0.00	97.70	2.30	100
1990	75.41	8.16	7.34	0.00	3.04	0.00	0.00	3.40	0.00	97.34	2.66	100
1991	74.84	8.42	7.52	0.00	3.13	0.00	0.00	3.35	0.00	97.25	2.75	100
1992	74.28	8.65	7.70	0.00	3.22	0.00	0.00	3.30	0.00	97.15	2.85	100
1993	73.83	8.82	7.83	0.00	3.28	0.00	0.00	3.23	0.00	97.00	3.00	100
1994	73.41	8.97	7.97	0.00	3.34	0.00	0.00	3.17	0.00	96.86	3.14	100
1995	72.97	9.11	8.10	0.00	3.40	0.00	0.00	3.12	0.00	96.70	3.30	100
1996	72.57	9.24	8.24	0.00	3.45	0.00	0.00	3.06	0.00	96.56	3.44	100
1997	72.19	9.36	8.36	0.00	3.49	0.00	0.00	3.01	0.00	96.41	3.59	100
1998	71.76	9.47	8.48	0.00	3.53	0.00	0.00	2.96	0.00	96.21	3.79	100
1999	71.37	9.56	8.60	0.00	3.57	0.00	0.00	2.91	0.00	96.02	3.98	100
2000	70.97	9.65	8.72	0.00	3.61	0.00	0.00	2.87	0.00	95.81	4.19	100

INDEX 1986 = 1.00

1985	0.97	0.92	1.11	0.00	0.99	0.00	0.00	1.14	0.00	0.98	9.18	1.01
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.07	1.13	1.17	0.00	1.19	0.00	0.00	1.18	0.00	1.09	5.00	1.10
1988	1.11	1.24	1.28	0.00	1.32	0.00	0.00	1.25	0.00	1.14	6.64	1.16
1989	1.14	1.34	1.38	0.00	1.43	0.00	0.00	1.30	0.00	1.18	8.19	1.20
1990	1.16	1.41	1.47	0.00	1.53	0.00	0.00	1.35	0.00	1.21	9.72	1.24
1991	1.17	1.49	1.53	0.00	1.61	0.00	0.00	1.35	0.00	1.23	10.24	1.26
1992	1.19	1.57	1.61	0.00	1.70	0.00	0.00	1.37	0.00	1.26	10.90	1.30
1993	1.23	1.66	1.70	0.00	1.80	0.00	0.00	1.39	0.00	1.31	11.93	1.35
1994	1.26	1.73	1.77	0.00	1.88	0.00	0.00	1.40	0.00	1.34	12.78	1.38
1995	1.27	1.78	1.83	0.00	1.94	0.00	0.00	1.39	0.00	1.36	13.62	1.40
1996	1.28	1.84	1.89	0.00	1.99	0.00	0.00	1.39	0.00	1.38	14.43	1.42
1997	1.31	1.91	1.97	0.00	2.08	0.00	0.00	1.40	0.00	1.41	15.45	1.46
1998	1.32	1.96	2.02	0.00	2.13	0.00	0.00	1.40	0.00	1.43	16.56	1.48
1999	1.34	2.03	2.11	0.00	2.21	0.00	0.00	1.41	0.00	1.46	17.85	1.52
2000	1.36	2.08	2.16	0.00	2.26	0.00	0.00	1.41	0.00	1.48	19.03	1.54

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE ALL OTHER PACKAGING MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	717	998	352	0	294	0	0	128	0	2502	139	2641
1986	715	982	435	0	361	0	0	80	0	2566	87	2654
1987	893	1154	487	0	352	0	0	97	0	2983	125	3108
1988	992	1353	545	0	362	0	0	106	0	3389	133	3522
1989	1087	1531	590	0	360	0	0	112	0	3724	148	3873
1990	1166	1698	627	0	353	0	0	116	0	4021	161	4182
1991	1213	1876	666	0	354	0	0	117	0	4308	161	4470
1992	1273	2085	712	0	359	0	0	118	0	4654	164	4818
1993	1356	2314	763	0	365	0	0	121	0	5032	180	5213
1994	1426	2534	808	0	368	0	0	122	0	5378	193	5572
1995	1478	2730	845	0	368	0	0	121	0	5670	206	5876
1996	1531	2932	882	0	368	0	0	121	0	5969	218	6187
1997	1605	3178	931	0	373	0	0	123	0	6353	235	6588
1998	1663	3398	972	0	375	0	0	123	0	6682	253	6935
1999	1744	3667	1026	0	382	0	0	125	0	7104	275	7380
2000	1797	3883	1065	0	384	0	0	126	0	7421	294	7716

AS PERCENT OF TOTAL FOR EACH YEAR

1985	27.15	37.78	13.32	0.00	11.13	0.00	0.00	4.85	0.00	94.73	5.27	100
1986	26.96	37.00	16.39	0.00	13.60	0.00	0.00	3.01	0.00	96.70	3.30	100
1987	28.75	37.14	15.67	0.00	11.35	0.00	0.00	3.15	0.00	95.95	4.05	100
1988	28.16	38.43	15.48	0.00	10.28	0.00	0.00	3.01	0.00	96.21	3.79	100
1989	28.07	39.54	15.24	0.00	9.31	0.00	0.00	2.89	0.00	96.17	3.83	100
1990	27.89	40.61	15.00	0.00	8.45	0.00	0.00	2.79	0.00	96.15	3.85	100
1991	27.15	41.98	14.90	0.00	7.92	0.00	0.00	2.62	0.00	96.38	3.62	100
1992	26.43	43.28	14.79	0.00	7.45	0.00	0.00	2.47	0.00	96.59	3.41	100
1993	26.02	44.41	14.65	0.00	7.01	0.00	0.00	2.32	0.00	96.54	3.46	100
1994	25.60	45.47	14.51	0.00	6.62	0.00	0.00	2.19	0.00	96.52	3.48	100
1995	25.16	46.46	14.38	0.00	6.27	0.00	0.00	2.07	0.00	96.49	3.51	100
1996	24.75	47.39	14.26	0.00	5.96	0.00	0.00	1.97	0.00	96.47	3.53	100
1997	24.37	48.24	14.14	0.00	5.67	0.00	0.00	1.87	0.00	96.43	3.57	100
1998	23.98	49.00	14.02	0.00	5.42	0.00	0.00	1.79	0.00	96.35	3.65	100
1999	23.64	49.70	13.91	0.00	5.19	0.00	0.00	1.71	0.00	96.27	3.73	100
2000	23.30	50.33	13.81	0.00	4.98	0.00	0.00	1.63	0.00	96.19	3.81	100

INDEX 1986 = 1.00

1985	1.00	1.02	0.81	0.00	0.81	0.00	0.00	1.60	0.00	0.97	1.59	1.00
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.25	1.18	1.12	0.00	0.98	0.00	0.00	1.22	0.00	1.16	1.44	1.17
1988	1.39	1.38	1.25	0.00	1.00	0.00	0.00	1.33	0.00	1.32	1.53	1.33
1989	1.52	1.56	1.36	0.00	1.00	0.00	0.00	1.40	0.00	1.45	1.70	1.46
1990	1.63	1.73	1.44	0.00	0.98	0.00	0.00	1.46	0.00	1.57	1.84	1.58
1991	1.70	1.91	1.53	0.00	0.98	0.00	0.00	1.46	0.00	1.68	1.85	1.68
1992	1.78	2.12	1.64	0.00	0.99	0.00	0.00	1.49	0.00	1.81	1.88	1.82
1993	1.90	2.36	1.76	0.00	1.01	0.00	0.00	1.51	0.00	1.96	2.06	1.96
1994	1.99	2.58	1.86	0.00	1.02	0.00	0.00	1.53	0.00	2.10	2.21	2.10
1995	2.07	2.78	1.94	0.00	1.02	0.00	0.00	1.52	0.00	2.21	2.36	2.21
1996	2.14	2.99	2.03	0.00	1.02	0.00	0.00	1.52	0.00	2.33	2.50	2.33
1997	2.24	3.24	2.14	0.00	1.04	0.00	0.00	1.54	0.00	2.48	2.69	2.48
1998	2.32	3.46	2.24	0.00	1.04	0.00	0.00	1.55	0.00	2.60	2.89	2.61
1999	2.44	3.73	2.36	0.00	1.06	0.00	0.00	1.57	0.00	2.77	3.15	2.78
2000	2.51	3.96	2.45	0.00	1.06	0.00	0.00	1.58	0.00	2.89	3.36	2.91

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE BUILDING AND CONSTRUCTION MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	327	546	0	134	449	0	0	4198	797	6451	102	6553
1986	195	522	0	133	418	0	0	4711	105	6084	96	6181
1987	269	617	0	135	443	0	0	4683	196	6345	258	6603
1988	301	662	0	132	460	0	0	5011	214	6783	354	7137
1989	334	716	0	130	482	0	0	5279	237	7181	433	7615
1990	367	770	0	130	502	0	0	5503	262	7535	510	8046
1991	379	798	0	126	516	0	0	5814	256	7890	554	8445
1992	401	840	0	124	537	0	0	6298	255	8457	618	9076
1993	428	891	0	124	565	0	0	6665	256	8930	668	9598
1994	446	928	0	122	584	0	0	7007	253	9343	717	10060
1995	457	951	0	119	593	0	0	7274	247	9643	763	10406
1996	471	976	0	116	603	0	0	7588	242	9998	812	10811
1997	499	1024	0	116	627	0	0	8203	242	10713	897	11610
1998	520	1066	0	115	648	0	0	8532	242	11125	953	12079
1999	546	1110	0	114	670	0	0	8919	241	11603	1016	12620
2000	563	1143	0	112	685	0	0	9295	238	12039	1082	13122

AS PERCENT OF TOTAL FOR EACH YEAR

1985	4.99	8.33	0.00	2.04	6.85	0.00	0.00	64.06	12.16	98.44	1.56	100
1986	3.16	8.45	0.00	2.15	6.76	0.00	0.00	76.22	1.70	98.43	1.57	100
1987	4.08	9.34	0.00	2.04	6.72	0.00	0.00	70.93	2.98	96.09	3.91	100
1988	4.23	9.29	0.00	1.85	6.45	0.00	0.00	70.21	3.01	95.04	4.96	100
1989	4.40	9.41	0.00	1.72	6.33	0.00	0.00	69.33	3.11	94.30	5.70	100
1990	4.56	9.58	0.00	1.62	6.25	0.00	0.00	68.40	3.26	93.66	6.34	100
1991	4.49	9.46	0.00	1.50	6.11	0.00	0.00	68.85	3.03	93.43	6.57	100
1992	4.42	9.26	0.00	1.38	5.92	0.00	0.00	69.39	2.81	93.18	6.82	100
1993	4.46	9.28	0.00	1.30	5.89	0.00	0.00	69.44	2.67	93.04	6.96	100
1994	4.43	9.23	0.00	1.22	5.81	0.00	0.00	69.65	2.52	92.87	7.13	100
1995	4.40	9.14	0.00	1.15	5.70	0.00	0.00	69.90	2.38	92.67	7.33	100
1996	4.36	9.03	0.00	1.07	5.58	0.00	0.00	70.19	2.24	92.48	7.52	100
1997	4.30	8.82	0.00	1.00	5.40	0.00	0.00	70.66	2.09	92.27	7.73	100
1998	4.31	8.83	0.00	0.95	5.37	0.00	0.00	70.64	2.00	92.10	7.90	100
1999	4.33	8.80	0.00	0.91	5.32	0.00	0.00	70.67	1.92	91.95	8.05	100
2000	4.29	8.72	0.00	0.86	5.22	0.00	0.00	70.84	1.82	91.75	8.25	100

INDEX 1986 = 1.00

1985	1.68	1.05	0.00	1.01	1.07	0.00	0.00	0.89	7.59	1.06	1.05	1.06
1986	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
1987	1.38	1.18	0.00	1.02	1.06	0.00	0.00	0.99	1.87	1.04	2.66	1.07
1988	1.55	1.27	0.00	0.99	1.10	0.00	0.00	1.06	2.04	1.11	3.65	1.15
1989	1.71	1.37	0.00	0.98	1.15	0.00	0.00	1.12	2.26	1.18	4.48	1.23
1990	1.88	1.48	0.00	0.98	1.20	0.00	0.00	1.17	2.49	1.24	5.27	1.30
1991	1.94	1.53	0.00	0.95	1.23	0.00	0.00	1.23	2.44	1.30	5.72	1.37
1992	2.06	1.61	0.00	0.94	1.29	0.00	0.00	1.34	2.43	1.39	6.38	1.47
1993	2.19	1.71	0.00	0.94	1.35	0.00	0.00	1.41	2.44	1.47	6.89	1.55
1994	2.29	1.78	0.00	0.92	1.40	0.00	0.00	1.49	2.42	1.54	7.40	1.63
1995	2.35	1.82	0.00	0.90	1.42	0.00	0.00	1.54	2.36	1.59	7.87	1.68
1996	2.41	1.87	0.00	0.87	1.44	0.00	0.00	1.61	2.31	1.64	8.39	1.75
1997	2.56	1.96	0.00	0.87	1.50	0.00	0.00	1.74	2.31	1.76	9.26	1.88
1998	2.66	2.04	0.00	0.87	1.55	0.00	0.00	1.81	2.31	1.83	9.84	1.95
1999	2.80	2.13	0.00	0.86	1.60	0.00	0.00	1.89	2.30	1.91	10.48	2.04
2000	2.89	2.19	0.00	0.85	1.64	0.00	0.00	1.97	2.27	1.98	11.17	2.12

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE PIPE,CONDUIT AND FITTINGS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	48	493	0	0	3	0	0	3014	0	3558	140	3698
1986	30	494	0	0	5	0	0	3287	0	3816	178	3995
1987	33	512	0	0	4	0	0	3264	0	3814	139	3953
1988	35	554	0	0	3	0	0	3543	0	4136	128	4265
1989	37	584	0	0	3	0	0	3754	0	4379	113	4492
1990	38	607	0	0	3	0	0	3926	0	4574	96	4671
1991	38	632	0	0	3	0	0	4178	0	4851	87	4939
1992	39	676	0	0	3	0	0	4570	0	5289	82	5371
1993	39	698	0	0	3	0	0	4826	0	5567	78	5646
1994	40	720	0	0	3	0	0	5090	0	5854	74	5928
1995	39	733	0	0	3	0	0	5308	0	6085	72	6157
1996	39	752	0	0	3	0	0	5568	0	6363	70	6433
1997	41	803	0	0	3	0	0	6079	0	6927	72	7000
1998	41	816	0	0	3	0	0	6319	0	7179	76	7256
1999	41	833	0	0	3	0	0	6602	0	7480	80	7561
2000	41	853	0	0	3	0	0	6911	0	7809	87	7896
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	1.30	13.33	0.00	0.00	0.08	0.00	0.00	81.50	0.00	96.21	3.79	100
1986	0.77	12.36	0.00	0.00	0.13	0.00	0.00	82.27	0.00	95.53	4.47	100
1987	0.85	12.95	0.00	0.00	0.10	0.00	0.00	82.57	0.00	96.48	3.52	100
1988	0.84	12.99	0.00	0.00	0.09	0.00	0.00	83.07	0.00	96.99	3.01	100
1989	0.83	13.00	0.00	0.00	0.08	0.00	0.00	83.57	0.00	97.48	2.52	100
1990	0.81	12.99	0.00	0.00	0.07	0.00	0.00	84.06	0.00	97.94	2.06	100
1991	0.77	12.80	0.00	0.00	0.07	0.00	0.00	84.59	0.00	98.22	1.78	100
1992	0.74	12.59	0.00	0.00	0.06	0.00	0.00	85.08	0.00	98.46	1.54	100
1993	0.71	12.37	0.00	0.00	0.06	0.00	0.00	85.48	0.00	98.61	1.39	100
1994	0.68	12.14	0.00	0.00	0.05	0.00	0.00	85.87	0.00	98.74	1.26	100
1995	0.65	11.92	0.00	0.00	0.05	0.00	0.00	86.21	0.00	98.83	1.17	100
1996	0.62	11.69	0.00	0.00	0.05	0.00	0.00	86.55	0.00	98.91	1.09	100
1997	0.59	11.47	0.00	0.00	0.05	0.00	0.00	86.85	0.00	98.97	1.03	100
1998	0.57	11.25	0.00	0.00	0.04	0.00	0.00	87.09	0.00	98.95	1.05	100
1999	0.55	11.03	0.00	0.00	0.04	0.00	0.00	87.32	0.00	98.93	1.07	100
2000	0.53	10.81	0.00	0.00	0.04	0.00	0.00	87.52	0.00	98.89	1.11	100
INDEX 1986 = 1.00												
1985	1.56	1.00	0.00	0.00	0.60	0.00	0.00	0.92	0.00	0.93	0.78	0.93
1986	1.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.10	1.04	0.00	0.00	0.79	0.00	0.00	0.99	0.00	1.00	0.78	0.99
1988	1.17	1.12	0.00	0.00	0.77	0.00	0.00	1.08	0.00	1.08	0.72	1.07
1989	1.21	1.18	0.00	0.00	0.71	0.00	0.00	1.14	0.00	1.15	0.63	1.12
1990	1.24	1.23	0.00	0.00	0.65	0.00	0.00	1.19	0.00	1.20	0.54	1.17
1991	1.24	1.28	0.00	0.00	0.65	0.00	0.00	1.27	0.00	1.27	0.49	1.24
1992	1.29	1.37	0.00	0.00	0.66	0.00	0.00	1.39	0.00	1.39	0.46	1.34
1993	1.30	1.41	0.00	0.00	0.65	0.00	0.00	1.47	0.00	1.46	0.44	1.41
1994	1.30	1.46	0.00	0.00	0.65	0.00	0.00	1.55	0.00	1.53	0.42	1.48
1995	1.30	1.49	0.00	0.00	0.63	0.00	0.00	1.62	0.00	1.59	0.40	1.54
1996	1.30	1.52	0.00	0.00	0.63	0.00	0.00	1.69	0.00	1.67	0.39	1.61
1997	1.36	1.63	0.00	0.00	0.65	0.00	0.00	1.85	0.00	1.82	0.41	1.75
1998	1.35	1.65	0.00	0.00	0.63	0.00	0.00	1.92	0.00	1.88	0.43	1.82
1999	1.35	1.69	0.00	0.00	0.63	0.00	0.00	2.01	0.00	1.96	0.45	1.89
2000	1.36	1.73	0.00	0.00	0.62	0.00	0.00	2.10	0.00	2.05	0.49	1.98

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE MATERIALS FOR ALL STRUCTURES MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	129	0	0	0	416	0	0	875	0	1420	495	1915
1986	67	0	0	0	353	0	0	1087	0	1507	131	1638
1987	100	0	0	0	389	0	0	1071	0	1561	479	2040
1988	112	0	0	0	408	0	0	1091	0	1612	603	2215
1989	126	0	0	0	432	0	0	1125	0	1684	742	2426
1990	140	0	0	0	456	0	0	1156	0	1753	887	2641
1991	145	0	0	0	470	0	0	1190	0	1806	941	2748
1992	152	0	0	0	490	0	0	1242	0	1885	1010	2895
1993	163	0	0	0	517	0	0	1311	0	1992	1095	3088
1994	171	0	0	0	536	0	0	1360	0	2067	1166	3233
1995	176	0	0	0	545	0	0	1385	0	2107	1218	3325
1996	181	0	0	0	556	0	0	1414	0	2151	1272	3424
1997	191	0	0	0	578	0	0	1472	0	2241	1354	3596
1998	200	0	0	0	599	0	0	1527	0	2327	1437	3765
1999	209	0	0	0	621	0	0	1583	0	2414	1522	3936
2000	217	0	0	0	636	0	0	1622	0	2475	1593	4068

AS PERCENT OF TOTAL FOR EACH YEAR

1985	6.74	0.00	0.00	0.00	21.72	0.00	0.00	45.69	0.00	74.14	25.86	100
1986	4.11	0.00	0.00	0.00	21.55	0.00	0.00	66.34	0.00	92.00	8.00	100
1987	4.92	0.00	0.00	0.00	19.09	0.00	0.00	52.49	0.00	76.50	23.50	100
1988	5.07	0.00	0.00	0.00	18.43	0.00	0.00	49.27	0.00	72.77	27.23	100
1989	5.21	0.00	0.00	0.00	17.83	0.00	0.00	46.38	0.00	69.42	30.58	100
1990	5.33	0.00	0.00	0.00	17.30	0.00	0.00	43.76	0.00	66.39	33.61	100
1991	5.30	0.00	0.00	0.00	17.11	0.00	0.00	43.33	0.00	65.74	34.26	100
1992	5.28	0.00	0.00	0.00	16.93	0.00	0.00	42.91	0.00	65.12	34.88	100
1993	5.29	0.00	0.00	0.00	16.75	0.00	0.00	42.48	0.00	64.51	35.49	100
1994	5.30	0.00	0.00	0.00	16.58	0.00	0.00	42.07	0.00	63.94	36.06	100
1995	5.29	0.00	0.00	0.00	16.41	0.00	0.00	41.67	0.00	63.37	36.63	100
1996	5.30	0.00	0.00	0.00	16.25	0.00	0.00	41.30	0.00	62.84	37.16	100
1997	5.31	0.00	0.00	0.00	16.09	0.00	0.00	40.94	0.00	62.34	37.66	100
1998	5.32	0.00	0.00	0.00	15.93	0.00	0.00	40.57	0.00	61.82	38.18	100
1999	5.33	0.00	0.00	0.00	15.78	0.00	0.00	40.22	0.00	61.33	38.67	100
2000	5.33	0.00	0.00	0.00	15.64	0.00	0.00	39.88	0.00	60.85	39.15	100

INDEX 1986 = 1.00

1985	1.91	0.00	0.00	0.00	1.18	0.00	0.00	0.80	0.00	0.94	3.78	1.17
1986	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.49	0.00	0.00	0.00	1.10	0.00	0.00	0.99	0.00	1.04	3.66	1.25
1988	1.67	0.00	0.00	0.00	1.16	0.00	0.00	1.00	0.00	1.07	4.60	1.35
1989	1.88	0.00	0.00	0.00	1.23	0.00	0.00	1.04	0.00	1.12	5.66	1.48
1990	2.09	0.00	0.00	0.00	1.29	0.00	0.00	1.06	0.00	1.16	6.77	1.61
1991	2.16	0.00	0.00	0.00	1.33	0.00	0.00	1.10	0.00	1.20	7.18	1.68
1992	2.27	0.00	0.00	0.00	1.39	0.00	0.00	1.14	0.00	1.25	7.71	1.77
1993	2.42	0.00	0.00	0.00	1.47	0.00	0.00	1.21	0.00	1.32	8.36	1.88
1994	2.54	0.00	0.00	0.00	1.52	0.00	0.00	1.25	0.00	1.37	8.90	1.97
1995	2.61	0.00	0.00	0.00	1.55	0.00	0.00	1.27	0.00	1.40	9.29	2.03
1996	2.69	0.00	0.00	0.00	1.58	0.00	0.00	1.30	0.00	1.43	9.71	2.09
1997	2.84	0.00	0.00	0.00	1.64	0.00	0.00	1.35	0.00	1.49	10.33	2.19
1998	2.97	0.00	0.00	0.00	1.70	0.00	0.00	1.41	0.00	1.54	10.97	2.30
1999	3.11	0.00	0.00	0.00	1.76	0.00	0.00	1.46	0.00	1.60	11.62	2.40
2000	3.22	0.00	0.00	0.00	1.80	0.00	0.00	1.49	0.00	1.64	12.16	2.48

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE ALL OTHER BUILDING AND CONSTR MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	150	0	0	0	30	0	0	309	0	489	450	939
1986	97	0	0	0	60	0	0	337	0	494	53	547
1987	135	0	0	0	50	0	0	348	0	533	75	609
1988	153	0	0	0	48	0	0	376	0	578	77	656
1989	171	0	0	0	45	0	0	399	0	616	79	695
1990	188	0	0	0	42	0	0	420	0	651	81	733
1991	195	0	0	0	42	0	0	445	0	683	74	758
1992	209	0	0	0	43	0	0	485	0	738	70	808
1993	224	0	0	0	44	0	0	526	0	796	67	863
1994	234	0	0	0	44	0	0	556	0	836	62	898
1995	241	0	0	0	44	0	0	580	0	866	57	923
1996	250	0	0	0	44	0	0	606	0	900	52	953
1997	266	0	0	0	45	0	0	651	0	963	50	1014
1998	278	0	0	0	45	0	0	686	0	1010	47	1057
1999	295	0	0	0	46	0	0	733	0	1075	46	1122
2000	304	0	0	0	46	0	0	762	0	1112	43	1156
					AS PERCENT OF TOTAL FOR EACH YEAR							
1985	15.96	0.00	0.00	0.00	3.19	0.00	0.00	32.88	0.00	52.03	47.97	100
1986	17.74	0.00	0.00	0.00	10.96	0.00	0.00	61.58	0.00	90.28	9.72	100
1987	22.19	0.00	0.00	0.00	8.21	0.00	0.00	57.16	0.00	87.56	12.44	100
1988	23.44	0.00	0.00	0.00	7.39	0.00	0.00	57.33	0.00	88.16	11.84	100
1989	24.61	0.00	0.00	0.00	6.59	0.00	0.00	57.39	0.00	88.59	11.41	100
1990	25.68	0.00	0.00	0.00	5.80	0.00	0.00	57.35	0.00	88.83	11.17	100
1991	25.78	0.00	0.00	0.00	5.61	0.00	0.00	58.79	0.00	90.17	9.83	100
1992	25.88	0.00	0.00	0.00	5.41	0.00	0.00	60.04	0.00	91.32	8.68	100
1993	26.02	0.00	0.00	0.00	5.19	0.00	0.00	61.00	0.00	92.21	7.79	100
1994	26.13	0.00	0.00	0.00	5.00	0.00	0.00	61.94	0.00	93.06	6.94	100
1995	26.19	0.00	0.00	0.00	4.81	0.00	0.00	62.81	0.00	93.81	6.19	100
1996	26.24	0.00	0.00	0.00	4.63	0.00	0.00	63.61	0.00	94.48	5.52	100
1997	26.30	0.00	0.00	0.00	4.45	0.00	0.00	64.27	0.00	95.02	4.98	100
1998	26.32	0.00	0.00	0.00	4.29	0.00	0.00	64.87	0.00	95.48	4.52	100
1999	26.34	0.00	0.00	0.00	4.13	0.00	0.00	65.39	0.00	95.86	4.14	100
2000	26.33	0.00	0.00	0.00	3.98	0.00	0.00	65.91	0.00	96.22	3.78	100
					INDEX 1986 = 1.00							
1985	1.54	0.00	0.00	0.00	0.50	0.00	0.00	0.92	0.00	0.99	8.47	1.72
1986	1.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.39	0.00	0.00	0.00	0.83	0.00	0.00	1.03	0.00	1.08	1.42	1.11
1988	1.58	0.00	0.00	0.00	0.81	0.00	0.00	1.12	0.00	1.17	1.46	1.20
1989	1.76	0.00	0.00	0.00	0.76	0.00	0.00	1.18	0.00	1.25	1.49	1.27
1990	1.94	0.00	0.00	0.00	0.71	0.00	0.00	1.25	0.00	1.32	1.54	1.34
1991	2.01	0.00	0.00	0.00	0.71	0.00	0.00	1.32	0.00	1.38	1.40	1.39
1992	2.16	0.00	0.00	0.00	0.73	0.00	0.00	1.44	0.00	1.49	1.32	1.48
1993	2.32	0.00	0.00	0.00	0.75	0.00	0.00	1.56	0.00	1.61	1.26	1.58
1994	2.42	0.00	0.00	0.00	0.75	0.00	0.00	1.65	0.00	1.69	1.17	1.64
1995	2.49	0.00	0.00	0.00	0.74	0.00	0.00	1.72	0.00	1.75	1.07	1.69
1996	2.58	0.00	0.00	0.00	0.74	0.00	0.00	1.80	0.00	1.82	0.99	1.74
1997	2.75	0.00	0.00	0.00	0.75	0.00	0.00	1.93	0.00	1.95	0.95	1.85
1998	2.87	0.00	0.00	0.00	0.76	0.00	0.00	2.04	0.00	2.04	0.90	1.93
1999	3.04	0.00	0.00	0.00	0.77	0.00	0.00	2.18	0.00	2.18	0.87	2.05
2000	3.14	0.00	0.00	0.00	0.77	0.00	0.00	2.26	0.00	2.25	0.82	2.11

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE ELECTRICAL/ELECTRONIC MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	403	153	273	241	309	0	67	479	343	2268	40	2308
1986	420	147	277	261	360	0	71	478	284	2298	7	2306
1987	432	161	284	268	361	0	80	458	315	2363	39	2403
1988	478	183	317	296	396	0	93	502	354	2623	71	2694
1989	489	193	329	305	404	0	101	503	372	2698	98	2797
1990	474	193	324	298	391	0	105	474	371	2632	102	2734
1991	465	193	325	296	387	0	108	466	368	2609	127	2737
1992	471	199	335	302	394	0	114	470	375	2662	148	2810
1993	491	208	352	315	409	0	123	483	390	2773	166	2939
1994	503	215	364	323	418	0	130	490	399	2845	192	3037
1995	503	217	368	324	418	0	135	488	400	2856	216	3073
1996	501	217	370	323	417	0	139	484	399	2854	241	3096
1997	515	225	383	332	428	0	147	492	409	2933	258	3192
1998	524	230	393	338	435	0	154	497	416	2990	279	3269
1999	545	240	410	352	451	0	165	512	431	3109	298	3407
2000	550	243	417	355	455	0	171	515	436	3145	324	3469
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	17.46	6.63	11.83	10.44	13.39	0.00	2.90	20.75	14.86	98.27	1.73	100
1986	18.25	6.37	12.01	11.32	15.61	0.00	3.08	20.73	12.31	99.67	0.33	100
1987	17.99	6.73	11.84	11.16	15.06	0.00	3.34	19.09	13.13	98.35	1.65	100
1988	17.75	6.79	11.78	11.01	14.71	0.00	3.48	18.65	13.17	97.35	2.65	100
1989	17.51	6.90	11.77	10.91	14.45	0.00	3.64	18.01	13.31	96.49	3.51	100
1990	17.33	7.07	11.85	10.90	14.30	0.00	3.84	17.37	13.59	96.25	3.75	100
1991	17.00	7.07	11.88	10.82	14.14	0.00	3.96	17.02	13.45	95.34	4.66	100
1992	16.77	7.08	11.93	10.76	14.02	0.00	4.08	16.73	13.36	94.73	5.27	100
1993	16.71	7.09	11.98	10.72	13.92	0.00	4.20	16.44	13.27	94.34	5.66	100
1994	16.57	7.08	11.99	10.63	13.78	0.00	4.31	16.16	13.15	93.67	6.33	100
1995	16.39	7.06	11.98	10.55	13.63	0.00	4.41	15.90	13.02	92.94	7.06	100
1996	16.20	7.04	11.97	10.46	13.49	0.00	4.51	15.65	12.89	92.21	7.79	100
1997	16.14	7.05	12.01	10.42	13.41	0.00	4.63	15.42	12.82	91.89	8.11	100
1998	16.04	7.04	12.02	10.36	13.30	0.00	4.73	15.23	12.73	91.46	8.54	100
1999	16.00	7.05	12.05	10.33	13.24	0.00	4.85	15.03	12.67	91.23	8.77	100
2000	15.86	7.02	12.04	10.26	13.12	0.00	4.94	14.85	12.57	90.65	9.35	100
INDEX 1986 = 1.00												
1985	0.96	1.04	0.99	0.92	0.86	0.00	0.94	1.00	1.21	0.99	5.34	1.00
1986	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
1987	1.03	1.10	1.03	1.03	1.01	0.00	1.13	0.96	1.11	1.03	5.30	1.04
1988	1.14	1.25	1.15	1.14	1.10	0.00	1.32	1.05	1.25	1.14	9.54	1.17
1989	1.16	1.31	1.19	1.17	1.12	0.00	1.44	1.05	1.31	1.17	13.08	1.21
1990	1.13	1.32	1.17	1.14	1.09	0.00	1.48	0.99	1.31	1.14	13.68	1.19
1991	1.11	1.32	1.17	1.13	1.08	0.00	1.53	0.97	1.30	1.14	17.02	1.19
1992	1.12	1.35	1.21	1.16	1.09	0.00	1.62	0.98	1.32	1.16	19.75	1.22
1993	1.17	1.42	1.27	1.21	1.14	0.00	1.74	1.01	1.37	1.21	22.21	1.27
1994	1.20	1.46	1.31	1.24	1.16	0.00	1.84	1.03	1.41	1.24	25.64	1.32
1995	1.20	1.48	1.33	1.24	1.16	0.00	1.91	1.02	1.41	1.24	28.93	1.33
1996	1.19	1.48	1.34	1.24	1.16	0.00	1.97	1.01	1.41	1.24	32.16	1.34
1997	1.22	1.53	1.38	1.27	1.19	0.00	2.08	1.03	1.44	1.28	34.52	1.38
1998	1.25	1.57	1.42	1.30	1.21	0.00	2.18	1.04	1.47	1.30	37.24	1.42
1999	1.30	1.63	1.48	1.35	1.25	0.00	2.33	1.07	1.52	1.35	39.86	1.48
2000	1.31	1.66	1.51	1.36	1.26	0.00	2.42	1.08	1.54	1.37	43.26	1.50

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE APPLIANCES, HOME AND INDUSTRI MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	120	0	267	0	0	24	0	411	330	741
1986	0	0	130	0	281	0	0	15	0	426	354	780
1987	0	0	132	0	299	0	0	20	0	452	356	809
1988	0	0	144	0	327	0	0	22	0	494	379	874
1989	0	0	149	0	342	0	0	24	0	516	385	902
1990	0	0	147	0	340	0	0	25	0	513	372	886
1991	0	0	150	0	345	0	0	25	0	521	372	893
1992	0	0	157	0	358	0	0	25	0	541	379	921
1993	0	0	167	0	378	0	0	26	0	571	394	966
1994	0	0	175	0	394	0	0	26	0	595	404	1000
1995	0	0	180	0	402	0	0	26	0	608	407	1016
1996	0	0	184	0	409	0	0	26	0	620	409	1029
1997	0	0	194	0	427	0	0	26	0	647	420	1068
1998	0	0	201	0	439	0	0	27	0	668	428	1096
1999	0	0	213	0	462	0	0	27	0	703	444	1148
2000	0	0	219	0	474	0	0	28	0	722	450	1173

AS PERCENT OF TOTAL FOR EACH YEAR

1985	0.00	0.00	16.19	0.00	36.03	0.00	0.00	3.24	0.00	55.47	44.53	100
1986	0.00	0.00	16.66	0.00	36.00	0.00	0.00	1.92	0.00	54.58	45.42	100
1987	0.00	0.00	16.37	0.00	37.01	0.00	0.00	2.54	0.00	55.92	44.08	100
1988	0.00	0.00	16.48	0.00	37.48	0.00	0.00	2.62	0.00	56.58	43.42	100
1989	0.00	0.00	16.57	0.00	37.95	0.00	0.00	2.74	0.00	57.25	42.75	100
1990	0.00	0.00	16.63	0.00	38.43	0.00	0.00	2.89	0.00	57.94	42.06	100
1991	0.00	0.00	16.87	0.00	38.69	0.00	0.00	2.81	0.00	58.37	41.63	100
1992	0.00	0.00	17.10	0.00	38.94	0.00	0.00	2.75	0.00	58.79	41.21	100
1993	0.00	0.00	17.32	0.00	39.15	0.00	0.00	2.69	0.00	59.16	40.84	100
1994	0.00	0.00	17.54	0.00	39.37	0.00	0.00	2.63	0.00	59.54	40.46	100
1995	0.00	0.00	17.75	0.00	39.57	0.00	0.00	2.59	0.00	59.90	40.10	100
1996	0.00	0.00	17.96	0.00	39.77	0.00	0.00	2.54	0.00	60.27	39.73	100
1997	0.00	0.00	18.16	0.00	39.96	0.00	0.00	2.50	0.00	60.63	39.37	100
1998	0.00	0.00	18.35	0.00	40.12	0.00	0.00	2.47	0.00	60.94	39.06	100
1999	0.00	0.00	18.55	0.00	40.29	0.00	0.00	2.43	0.00	61.27	38.73	100
2000	0.00	0.00	18.73	0.00	40.44	0.00	0.00	2.40	0.00	61.57	38.43	100

INDEX 1986 = 1.00

1985	0.00	0.00	0.92	0.00	0.95	0.00	0.00	1.60	0.00	0.96	0.93	0.95
1986	0.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	0.00	1.02	0.00	1.07	0.00	0.00	1.37	0.00	1.06	1.01	1.04
1988	0.00	0.00	1.11	0.00	1.17	0.00	0.00	1.53	0.00	1.16	1.07	1.12
1989	0.00	0.00	1.15	0.00	1.22	0.00	0.00	1.65	0.00	1.21	1.09	1.16
1990	0.00	0.00	1.13	0.00	1.21	0.00	0.00	1.71	0.00	1.21	1.05	1.14
1991	0.00	0.00	1.16	0.00	1.23	0.00	0.00	1.67	0.00	1.22	1.05	1.14
1992	0.00	0.00	1.21	0.00	1.28	0.00	0.00	1.69	0.00	1.27	1.07	1.18
1993	0.00	0.00	1.29	0.00	1.35	0.00	0.00	1.73	0.00	1.34	1.11	1.24
1994	0.00	0.00	1.35	0.00	1.40	0.00	0.00	1.76	0.00	1.40	1.14	1.28
1995	0.00	0.00	1.39	0.00	1.43	0.00	0.00	1.75	0.00	1.43	1.15	1.30
1996	0.00	0.00	1.42	0.00	1.46	0.00	0.00	1.75	0.00	1.46	1.15	1.32
1997	0.00	0.00	1.49	0.00	1.52	0.00	0.00	1.78	0.00	1.52	1.19	1.37
1998	0.00	0.00	1.55	0.00	1.57	0.00	0.00	1.80	0.00	1.57	1.21	1.40
1999	0.00	0.00	1.64	0.00	1.65	0.00	0.00	1.86	0.00	1.65	1.26	1.47
2000	0.00	0.00	1.69	0.00	1.69	0.00	0.00	1.88	0.00	1.70	1.27	1.50

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumpt

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE COMMUNICATIONS EQUIPMENT MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	0	0	0	0	0	60	0	60	40	100
1986	0	0	0	0	0	0	0	24	0	24	49	73
1987	0	0	0	0	0	0	0	36	0	36	53	89
1988	0	0	0	0	0	0	0	42	0	42	52	94
1989	0	0	0	0	0	0	0	45	0	45	47	92
1990	0	0	0	0	0	0	0	46	0	46	40	87
1991	0	0	0	0	0	0	0	44	0	44	35	80
1992	0	0	0	0	0	0	0	44	0	44	32	76
1993	0	0	0	0	0	0	0	45	0	45	30	76
1994	0	0	0	0	0	0	0	44	0	44	28	73
1995	0	0	0	0	0	0	0	43	0	43	25	69
1996	0	0	0	0	0	0	0	41	0	41	23	64
1997	0	0	0	0	0	0	0	41	0	41	21	63
1998	0	0	0	0	0	0	0	41	0	41	20	61
1999	0	0	0	0	0	0	0	42	0	42	19	61
2000	0	0	0	0	0	0	0	41	0	41	18	59

AS PERCENT OF TOTAL FOR EACH YEAR

1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	0.00	60.00	40.00	100
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.81	0.00	32.81	67.19	100
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50	0.00	40.50	59.50	100
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.32	0.00	44.32	55.68	100
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.66	0.00	48.66	51.34	100
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.64	0.00	53.64	46.36	100
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.63	0.00	55.63	44.37	100
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.52	0.00	57.52	42.48	100
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.29	0.00	59.29	40.71	100
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.99	0.00	60.99	39.01	100
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.60	0.00	62.60	37.40	100
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.14	0.00	64.14	35.86	100
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	65.61	0.00	65.61	34.39	100
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.97	0.00	66.97	33.03	100
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.27	0.00	68.27	31.73	100
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	69.50	0.00	69.50	30.50	100

INDEX 1986 = 1.00

1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00	2.50	0.81	1.37
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.51	0.00	1.51	1.08	1.22
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	1.75	1.07	1.30
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	1.88	0.97	1.27
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.00	1.95	0.82	1.20
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	0.00	1.86	0.72	1.10
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	1.84	0.66	1.05
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	1.88	0.63	1.04
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	0.00	1.86	0.58	1.00
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	1.80	0.53	0.94
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.73	0.00	1.73	0.47	0.88
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.73	0.00	1.73	0.44	0.87
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.73	0.00	1.73	0.42	0.85
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.76	0.00	1.76	0.40	0.85
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.00	1.72	0.37	0.81

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumptio

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE INDUSTRIAL EQUIPMENT AND BATT MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	0	0	0	0	0	395	0	729	742	1471
1986	0	0	0	0	0	0	0	439	0	794	662	1457
1987	0	0	0	0	0	0	0	402	0	772	737	1509
1988	0	0	0	0	0	0	0	437	0	859	869	1729
1989	0	0	0	0	0	0	0	434	0	873	932	1805
1990	0	0	0	0	0	0	0	402	0	830	934	1764
1991	0	0	0	0	0	0	0	396	0	818	950	1768
1992	0	0	0	0	0	0	0	400	0	828	988	1817
1993	0	0	0	0	0	0	0	412	0	857	1045	1902
1994	0	0	0	0	0	0	0	419	0	877	1090	1968
1995	0	0	0	0	0	0	0	419	0	879	1113	1993
1996	0	0	0	0	0	0	0	416	0	876	1129	2006
1997	0	0	0	0	0	0	0	424	0	895	1170	2065
1998	0	0	0	0	0	0	0	429	0	909	1206	2116
1999	0	0	0	0	0	0	0	442	0	940	1262	2202
2000	0	0	0	0	0	0	0	445	0	950	1291	2242

AS PERCENT OF TOTAL FOR EACH YEAR

1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.84	0.00	49.53	50.47	100
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.12	0.00	54.53	45.47	100
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.65	0.00	51.16	48.84	100
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.30	0.00	49.70	50.30	100
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.03	0.00	48.34	51.66	100
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.80	0.00	47.04	52.96	100
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.41	0.00	46.27	53.73	100
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.05	0.00	45.59	54.41	100
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.67	0.00	45.07	54.93	100
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.34	0.00	44.59	55.41	100
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.04	0.00	44.11	55.89	100
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.78	0.00	43.68	56.32	100
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.53	0.00	43.33	56.67	100
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.29	0.00	42.98	57.02	100
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.07	0.00	42.69	57.31	100
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.88	0.00	42.39	57.61	100

INDEX 1986 = 1.00

1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.92	1.12	1.01
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.97	1.11	1.04
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.08	1.31	1.19
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	1.10	1.41	1.24
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	1.04	1.41	1.21
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	1.03	1.43	1.21
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	1.04	1.49	1.25
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00	1.08	1.58	1.31
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	1.10	1.65	1.35
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	1.11	1.68	1.37
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	1.10	1.70	1.38
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	1.13	1.77	1.42
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	1.14	1.82	1.45
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	1.18	1.90	1.51
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	1.20	1.95	1.54

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumptio

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE FURNITURE AND FURNISHINGS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	1119	0	47	327	0	310	73	1876	126	2002
1986	0	0	1103	0	47	362	0	380	60	1952	129	2081
1987	0	0	1298	0	42	375	0	365	99	2181	120	2302
1988	0	0	1447	0	41	393	0	380	119	2381	123	2504
1989	0	0	1576	0	39	404	0	386	137	2544	124	2668
1990	0	0	1677	0	36	406	0	384	154	2660	120	2780
1991	0	0	1761	0	35	412	0	396	162	2766	131	2898
1992	0	0	1867	0	34	423	0	412	172	2909	139	3048
1993	0	0	1998	0	34	438	0	432	184	3089	146	3235
1994	0	0	2095	0	33	446	0	446	193	3214	163	3377
1995	0	0	2161	0	32	447	0	452	199	3292	173	3466
1996	0	0	2227	0	31	449	0	458	204	3371	177	3549
1997	0	0	2344	0	31	460	0	475	215	3526	184	3710
1998	0	0	2433	0	30	466	0	485	222	3637	189	3827
1999	0	0	2544	0	30	476	0	499	232	3783	200	3983
2000	0	0	2625	0	30	480	0	508	239	3883	214	4098
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	0.00	0.00	55.89	0.00	2.35	16.33	0.00	15.48	3.65	93.71	6.29	100
1986	0.00	0.00	53.00	0.00	2.26	17.40	0.00	18.26	2.88	93.80	6.20	100
1987	0.00	0.00	56.41	0.00	1.85	16.29	0.00	15.86	4.34	94.75	5.25	100
1988	0.00	0.00	57.78	0.00	1.65	15.69	0.00	15.18	4.77	95.07	4.93	100
1989	0.00	0.00	59.08	0.00	1.47	15.14	0.00	14.49	5.17	95.35	4.65	100
1990	0.00	0.00	60.34	0.00	1.31	14.62	0.00	13.84	5.55	95.67	4.33	100
1991	0.00	0.00	60.76	0.00	1.21	14.22	0.00	13.66	5.60	95.46	4.54	100
1992	0.00	0.00	61.27	0.00	1.13	13.88	0.00	13.51	5.65	95.44	4.56	100
1993	0.00	0.00	61.79	0.00	1.06	13.56	0.00	13.37	5.70	95.49	4.51	100
1994	0.00	0.00	62.02	0.00	1.00	13.21	0.00	13.20	5.72	95.16	4.84	100
1995	0.00	0.00	62.36	0.00	0.94	12.91	0.00	13.05	5.74	95.01	4.99	100
1996	0.00	0.00	62.76	0.00	0.89	12.65	0.00	12.92	5.77	94.99	5.01	100
1997	0.00	0.00	63.19	0.00	0.84	12.41	0.00	12.80	5.80	95.04	4.96	100
1998	0.00	0.00	63.57	0.00	0.80	12.18	0.00	12.67	5.82	95.05	4.95	100
1999	0.00	0.00	63.88	0.00	0.77	11.96	0.00	12.54	5.83	94.98	5.02	100
2000	0.00	0.00	64.07	0.00	0.73	11.73	0.00	12.40	5.83	94.77	5.23	100
INDEX 1986 = 1.00												
1985	0.00	0.00	1.01	0.00	1.00	0.90	0.00	0.82	1.22	0.96	0.98	0.96
1986	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
1987	0.00	0.00	1.18	0.00	0.91	1.04	0.00	0.96	1.67	1.12	0.94	1.11
1988	0.00	0.00	1.31	0.00	0.88	1.09	0.00	1.00	1.99	1.22	0.96	1.20
1989	0.00	0.00	1.43	0.00	0.83	1.12	0.00	1.02	2.30	1.30	0.96	1.28
1990	0.00	0.00	1.52	0.00	0.77	1.12	0.00	1.01	2.57	1.36	0.93	1.34
1991	0.00	0.00	1.60	0.00	0.75	1.14	0.00	1.04	2.71	1.42	1.02	1.39
1992	0.00	0.00	1.69	0.00	0.74	1.17	0.00	1.08	2.87	1.49	1.08	1.47
1993	0.00	0.00	1.81	0.00	0.73	1.21	0.00	1.14	3.07	1.58	1.13	1.55
1994	0.00	0.00	1.90	0.00	0.72	1.23	0.00	1.17	3.22	1.65	1.27	1.62
1995	0.00	0.00	1.96	0.00	0.69	1.24	0.00	1.19	3.32	1.69	1.34	1.67
1996	0.00	0.00	2.02	0.00	0.67	1.24	0.00	1.21	3.41	1.73	1.38	1.71
1997	0.00	0.00	2.13	0.00	0.67	1.27	0.00	1.25	3.59	1.81	1.43	1.78
1998	0.00	0.00	2.21	0.00	0.65	1.29	0.00	1.28	3.71	1.86	1.47	1.84
1999	0.00	0.00	2.31	0.00	0.65	1.32	0.00	1.31	3.87	1.94	1.55	1.91
2000	0.00	0.00	2.38	0.00	0.64	1.33	0.00	1.34	3.98	1.99	1.66	1.97

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consumptio

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE FURNITURE MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	0	0	0	0	0	124	0	124	181	305
1986	0	0	0	0	0	0	0	159	0	159	151	310
1987	0	0	0	0	0	0	0	140	0	140	133	273
1988	0	0	0	0	0	0	0	148	0	148	192	341
1989	0	0	0	0	0	0	0	154	0	154	200	355
1990	0	0	0	0	0	0	0	156	0	156	203	360
1991	0	0	0	0	0	0	0	169	0	169	218	388
1992	0	0	0	0	0	0	0	184	0	184	236	421
1993	0	0	0	0	0	0	0	201	0	201	257	459
1994	0	0	0	0	0	0	0	215	0	215	272	487
1995	0	0	0	0	0	0	0	225	0	225	283	508
1996	0	0	0	0	0	0	0	234	0	234	293	528
1997	0	0	0	0	0	0	0	249	0	249	310	560
1998	0	0	0	0	0	0	0	261	0	261	322	583
1999	0	0	0	0	0	0	0	274	0	274	336	611
2000	0	0	0	0	0	0	0	284	0	284	346	630

AS PERCENT OF TOTAL FOR EACH YEAR

1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.66	0.00	40.66	59.34	100
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.19	0.00	51.19	48.81	100
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.31	0.00	51.31	48.69	100
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.52	0.00	43.52	56.48	100
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.45	0.00	43.45	56.55	100
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.39	0.00	43.39	56.61	100
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.58	0.00	43.58	56.42	100
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.77	0.00	43.77	56.23	100
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.93	0.00	43.93	56.07	100
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.10	0.00	44.10	55.90	100
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.26	0.00	44.26	55.74	100
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.43	0.00	44.43	55.57	100
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.60	0.00	44.60	55.40	100
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.75	0.00	44.75	55.25	100
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.90	0.00	44.90	55.10	100
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.04	0.00	45.04	54.96	100

INDEX 1986 = 1.00

1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.00	0.78	1.19	0.98
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.88	0.88	0.88
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.93	1.27	1.10
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.97	1.32	1.14
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.98	1.34	1.16
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	1.06	1.44	1.25
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.16	1.56	1.36
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.00	1.27	1.70	1.48
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	0.00	1.35	1.80	1.57
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.00	1.42	1.87	1.64
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	1.48	1.94	1.70
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.00	1.57	2.05	1.80
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.64	0.00	1.64	2.13	1.88
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.73	0.00	1.73	2.22	1.97
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	0.00	1.79	2.29	2.03

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE CARPET AND TEXTILES MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	1029	0	0	0	0	186	0	1215	482	1697
1986	0	0	1001	0	0	0	0	221	0	1222	548	1770
1987	0	0	1178	0	0	0	0	224	0	1403	625	2028
1988	0	0	1314	0	0	0	0	231	0	1546	616	2163
1989	0	0	1422	0	0	0	0	232	0	1655	658	2313
1990	0	0	1504	0	0	0	0	228	0	1733	687	2420
1991	0	0	1570	0	0	0	0	226	0	1797	712	2510
1992	0	0	1653	0	0	0	0	227	0	1881	746	2627
1993	0	0	1755	0	0	0	0	230	0	1986	789	2775
1994	0	0	1835	0	0	0	0	230	0	2066	823	2889
1995	0	0	1886	0	0	0	0	227	0	2113	844	2957
1996	0	0	1933	0	0	0	0	223	0	2157	863	3020
1997	0	0	2023	0	0	0	0	225	0	2248	902	3150
1998	0	0	2088	0	0	0	0	223	0	2312	931	3243
1999	0	0	2175	0	0	0	0	225	0	2400	971	3371
2000	0	0	2241	0	0	0	0	223	0	2465	1001	3467
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	0.00	0.00	60.64	0.00	0.00	0.00	0.00	10.96	0.00	71.60	28.40	100
1986	0.00	0.00	56.54	0.00	0.00	0.00	0.00	12.48	0.00	69.02	30.98	100
1987	0.00	0.00	58.11	0.00	0.00	0.00	0.00	11.08	0.00	69.19	30.81	100
1988	0.00	0.00	60.78	0.00	0.00	0.00	0.00	10.72	0.00	71.49	28.51	100
1989	0.00	0.00	61.49	0.00	0.00	0.00	0.00	10.05	0.00	71.54	28.46	100
1990	0.00	0.00	62.15	0.00	0.00	0.00	0.00	9.45	0.00	71.60	28.40	100
1991	0.00	0.00	62.56	0.00	0.00	0.00	0.00	9.04	0.00	71.60	28.40	100
1992	0.00	0.00	62.94	0.00	0.00	0.00	0.00	8.66	0.00	71.60	28.40	100
1993	0.00	0.00	63.24	0.00	0.00	0.00	0.00	8.31	0.00	71.55	28.45	100
1994	0.00	0.00	63.53	0.00	0.00	0.00	0.00	7.99	0.00	71.51	28.49	100
1995	0.00	0.00	63.77	0.00	0.00	0.00	0.00	7.68	0.00	71.46	28.54	100
1996	0.00	0.00	64.01	0.00	0.00	0.00	0.00	7.41	0.00	71.41	28.59	100
1997	0.00	0.00	64.22	0.00	0.00	0.00	0.00	7.15	0.00	71.37	28.63	100
1998	0.00	0.00	64.38	0.00	0.00	0.00	0.00	6.90	0.00	71.28	28.72	100
1999	0.00	0.00	64.53	0.00	0.00	0.00	0.00	6.67	0.00	71.20	28.80	100
2000	0.00	0.00	64.65	0.00	0.00	0.00	0.00	6.46	0.00	71.11	28.89	100
INDEX 1986 = 1.00												
1985	0.00	0.00	1.03	0.00	0.00	0.00	0.00	0.84	0.00	0.99	0.88	0.96
1986	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.00	0.00	1.18	0.00	0.00	0.00	0.00	1.02	0.00	1.15	1.14	1.15
1988	0.00	0.00	1.31	0.00	0.00	0.00	0.00	1.05	0.00	1.27	1.12	1.22
1989	0.00	0.00	1.42	0.00	0.00	0.00	0.00	1.05	0.00	1.35	1.20	1.31
1990	0.00	0.00	1.50	0.00	0.00	0.00	0.00	1.03	0.00	1.42	1.25	1.37
1991	0.00	0.00	1.57	0.00	0.00	0.00	0.00	1.03	0.00	1.47	1.30	1.42
1992	0.00	0.00	1.65	0.00	0.00	0.00	0.00	1.03	0.00	1.54	1.36	1.48
1993	0.00	0.00	1.75	0.00	0.00	0.00	0.00	1.04	0.00	1.63	1.44	1.57
1994	0.00	0.00	1.83	0.00	0.00	0.00	0.00	1.04	0.00	1.69	1.50	1.63
1995	0.00	0.00	1.88	0.00	0.00	0.00	0.00	1.03	0.00	1.73	1.54	1.67
1996	0.00	0.00	1.93	0.00	0.00	0.00	0.00	1.01	0.00	1.77	1.57	1.71
1997	0.00	0.00	2.02	0.00	0.00	0.00	0.00	1.02	0.00	1.84	1.64	1.78
1998	0.00	0.00	2.09	0.00	0.00	0.00	0.00	1.01	0.00	1.89	1.70	1.83
1999	0.00	0.00	2.17	0.00	0.00	0.00	0.00	1.02	0.00	1.96	1.77	1.90
2000	0.00	0.00	2.24	0.00	0.00	0.00	0.00	1.01	0.00	2.02	1.83	1.96

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE CONSUMER AND INSTITUTIONAL PROD MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	468	507	621	0	1090	0	0	229	625	3540	230	3770
1986	506	783	732	0	1296	0	0	277	31	3625	271	3897
1987	505	729	754	0	1203	0	0	286	400	3879	309	4189
1988	505	765	807	0	1228	0	0	292	535	4133	340	4473
1989	504	800	859	0	1244	0	0	298	682	4388	356	4744
1990	493	820	895	0	1233	0	0	299	824	4566	357	4923
1991	482	878	944	0	1266	0	0	298	868	4738	378	5117
1992	476	947	1004	0	1312	0	0	300	919	4960	406	5366
1993	478	1033	1082	0	1371	0	0	307	985	5258	445	5704
1994	476	1107	1155	0	1422	0	0	310	1041	5512	478	5990
1995	469	1179	1220	0	1458	0	0	311	1089	5728	508	6236
1996	461	1243	1280	0	1491	0	0	310	1130	5916	537	6454
1997	461	1338	1365	0	1542	0	0	316	1192	6216	582	6799
1998	457	1409	1444	0	1591	0	0	318	1242	6464	619	7083
1999	457	1505	1545	0	1647	0	0	325	1309	6790	671	7461
2000	455	1586	1637	0	1698	0	0	329	1364	7072	714	7786

AS PERCENT OF TOTAL FOR EACH YEAR

1985	12.41	13.45	16.47	0.00	28.91	0.00	0.00	6.07	16.58	93.90	6.10	100
1986	13.01	20.09	18.78	0.00	33.25	0.00	0.00	7.11	0.80	93.03	6.97	100
1987	12.06	17.42	18.02	0.00	28.73	0.00	0.00	6.84	9.55	92.61	7.39	100
1988	11.29	17.10	18.04	0.00	27.46	0.00	0.00	6.54	11.97	92.40	7.60	100
1989	10.63	16.86	18.11	0.00	26.22	0.00	0.00	6.29	14.37	92.49	7.51	100
1990	10.02	16.67	18.19	0.00	25.04	0.00	0.00	6.08	16.75	92.75	7.25	100
1991	9.43	17.17	18.45	0.00	24.75	0.00	0.00	5.83	16.97	92.60	7.40	100
1992	8.88	17.65	18.72	0.00	24.46	0.00	0.00	5.60	17.14	92.43	7.57	100
1993	8.39	18.12	18.97	0.00	24.05	0.00	0.00	5.38	17.28	92.19	7.81	100
1994	7.95	18.48	19.29	0.00	23.74	0.00	0.00	5.18	17.38	92.02	7.98	100
1995	7.53	18.91	19.57	0.00	23.38	0.00	0.00	4.99	17.46	91.84	8.16	100
1996	7.14	19.27	19.84	0.00	23.10	0.00	0.00	4.81	17.51	91.67	8.33	100
1997	6.78	19.68	20.08	0.00	22.69	0.00	0.00	4.66	17.54	91.43	8.57	100
1998	6.45	19.90	20.40	0.00	22.47	0.00	0.00	4.50	17.54	91.26	8.74	100
1999	6.13	20.17	20.71	0.00	22.07	0.00	0.00	4.36	17.55	91.00	9.00	100
2000	5.85	20.37	21.03	0.00	21.81	0.00	0.00	4.23	17.53	90.82	9.18	100

INDEX 1986 = 1.00

1985	0.92	0.65	0.85	0.00	0.84	0.00	0.00	0.83	20.16	0.98	0.85	0.97
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
1987	1.00	0.93	1.03	0.00	0.93	0.00	0.00	1.03	12.91	1.07	1.14	1.07
1988	1.00	0.98	1.10	0.00	0.95	0.00	0.00	1.06	17.27	1.14	1.25	1.15
1989	1.00	1.02	1.17	0.00	0.96	0.00	0.00	1.08	22.00	1.21	1.31	1.22
1990	0.97	1.05	1.22	0.00	0.95	0.00	0.00	1.08	26.60	1.26	1.32	1.26
1991	0.95	1.12	1.29	0.00	0.98	0.00	0.00	1.08	28.01	1.31	1.39	1.31
1992	0.94	1.21	1.37	0.00	1.01	0.00	0.00	1.08	29.67	1.37	1.50	1.38
1993	0.94	1.32	1.48	0.00	1.06	0.00	0.00	1.11	31.79	1.45	1.64	1.46
1994	0.94	1.41	1.58	0.00	1.10	0.00	0.00	1.12	33.59	1.52	1.76	1.54
1995	0.93	1.51	1.67	0.00	1.13	0.00	0.00	1.12	35.13	1.58	1.87	1.60
1996	0.91	1.59	1.75	0.00	1.15	0.00	0.00	1.12	36.45	1.63	1.98	1.66
1997	0.91	1.71	1.87	0.00	1.19	0.00	0.00	1.14	38.48	1.71	2.15	1.74
1998	0.90	1.80	1.97	0.00	1.23	0.00	0.00	1.15	40.09	1.78	2.28	1.82
1999	0.90	1.92	2.11	0.00	1.27	0.00	0.00	1.18	42.23	1.87	2.47	1.91
2000	0.90	2.03	2.24	0.00	1.31	0.00	0.00	1.19	44.03	1.95	2.63	2.00

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE DINNER,TABLE AND KITCHENWARE MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	175	49	67	0	679	0	0	2	0	972	19	991
1986	205	57	69	0	816	0	0	3	0	1150	41	1191
1987	192	64	82	0	710	0	0	2	0	1053	27	1081
1988	189	64	86	0	716	0	0	2	0	1058	23	1082
1989	185	64	89	0	721	0	0	2	0	1064	18	1082
1990	177	64	92	0	711	0	0	2	0	1048	14	1062
1991	173	61	90	0	745	0	0	2	0	1073	12	1085
1992	171	59	90	0	785	0	0	2	0	1108	10	1119
1993	171	58	90	0	831	0	0	2	0	1154	9	1164
1994	170	57	90	0	876	0	0	2	0	1195	9	1204
1995	167	55	88	0	912	0	0	2	0	1225	9	1234
1996	164	53	87	0	947	0	0	2	0	1255	8	1264
1997	163	52	87	0	990	0	0	2	0	1295	8	1304
1998	162	51	87	0	1038	0	0	2	0	1342	9	1352
1999	162	50	87	0	1084	0	0	2	0	1385	10	1396
2000	161	49	86	0	1133	0	0	2	0	1433	12	1446

AS PERCENT OF TOTAL FOR EACH YEAR

1985	17.66	4.94	6.76	0.00	68.52	0.00	0.00	0.20	0.00	98.08	1.92	100
1986	17.21	4.78	5.79	0.00	68.50	0.00	0.00	0.25	0.00	96.53	3.47	100
1987	17.83	5.96	7.66	0.00	65.70	0.00	0.00	0.27	0.00	97.42	2.58	100
1988	17.48	5.95	7.97	0.00	66.20	0.00	0.00	0.26	0.00	97.85	2.15	100
1989	17.12	5.98	8.30	0.00	66.62	0.00	0.00	0.25	0.00	98.27	1.73	100
1990	16.73	6.07	8.66	0.00	66.96	0.00	0.00	0.25	0.00	98.66	1.34	100
1991	16.00	5.69	8.36	0.00	68.61	0.00	0.00	0.23	0.00	98.88	1.12	100
1992	15.30	5.34	8.06	0.00	70.15	0.00	0.00	0.22	0.00	99.06	0.94	100
1993	14.70	5.02	7.76	0.00	71.47	0.00	0.00	0.21	0.00	99.15	0.85	100
1994	14.12	4.73	7.47	0.00	72.72	0.00	0.00	0.19	0.00	99.23	0.77	100
1995	13.56	4.46	7.20	0.00	73.87	0.00	0.00	0.18	0.00	99.27	0.73	100
1996	13.02	4.22	6.94	0.00	74.96	0.00	0.00	0.17	0.00	99.31	0.69	100
1997	12.53	4.00	6.69	0.00	75.95	0.00	0.00	0.16	0.00	99.33	0.67	100
1998	12.05	3.79	6.45	0.00	76.83	0.00	0.00	0.15	0.00	99.28	0.72	100
1999	11.60	3.60	6.23	0.00	77.66	0.00	0.00	0.15	0.00	99.23	0.77	100
2000	11.17	3.43	6.01	0.00	78.42	0.00	0.00	0.14	0.00	99.16	0.84	100

INDEX 1986 = 1.00

1985	0.85	0.86	0.97	0.00	0.83	0.00	0.00	0.67	0.00	0.85	0.46	0.83
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.94	1.13	1.20	0.00	0.87	0.00	0.00	0.98	0.00	0.92	0.68	0.91
1988	0.92	1.13	1.25	0.00	0.88	0.00	0.00	0.95	0.00	0.92	0.56	0.91
1989	0.90	1.14	1.30	0.00	0.88	0.00	0.00	0.92	0.00	0.93	0.45	0.91
1990	0.87	1.13	1.33	0.00	0.87	0.00	0.00	0.88	0.00	0.91	0.34	0.89
1991	0.85	1.08	1.32	0.00	0.91	0.00	0.00	0.84	0.00	0.93	0.29	0.91
1992	0.84	1.05	1.31	0.00	0.96	0.00	0.00	0.82	0.00	0.96	0.25	0.94
1993	0.83	1.03	1.31	0.00	1.02	0.00	0.00	0.80	0.00	1.00	0.24	0.98
1994	0.83	1.00	1.30	0.00	1.07	0.00	0.00	0.77	0.00	1.04	0.22	1.01
1995	0.82	0.97	1.29	0.00	1.12	0.00	0.00	0.75	0.00	1.07	0.22	1.04
1996	0.80	0.94	1.27	0.00	1.16	0.00	0.00	0.72	0.00	1.09	0.21	1.06
1997	0.80	0.91	1.26	0.00	1.21	0.00	0.00	0.71	0.00	1.13	0.21	1.09
1998	0.79	0.90	1.26	0.00	1.27	0.00	0.00	0.69	0.00	1.17	0.24	1.13
1999	0.79	0.88	1.26	0.00	1.33	0.00	0.00	0.68	0.00	1.21	0.26	1.17
2000	0.79	0.87	1.26	0.00	1.39	0.00	0.00	0.67	0.00	1.25	0.29	1.21

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE HEALTH AND MEDICAL MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	83	49	270	0	71	0	0	55	0	528	91	619
1986	40	56	396	0	67	0	0	72	0	631	68	699
1987	60	50	400	0	76	0	0	75	0	662	93	756
1988	66	50	437	0	79	0	0	80	0	714	110	824
1989	72	49	476	0	83	0	0	85	0	767	127	895
1990	77	47	508	0	86	0	0	88	0	807	144	952
1991	76	48	552	0	85	0	0	91	0	854	157	1011
1992	75	49	606	0	86	0	0	96	0	913	173	1086
1993	76	51	671	0	88	0	0	102	0	989	193	1183
1994	76	52	739	0	89	0	0	108	0	1066	214	1281
1995	76	53	800	0	89	0	0	112	0	1133	234	1368
1996	75	54	860	0	89	0	0	116	0	1195	254	1450
1997	75	55	936	0	91	0	0	122	0	1281	279	1561
1998	76	56	1013	0	92	0	0	128	0	1366	307	1673
1999	77	58	1105	0	94	0	0	135	0	1470	339	1810
2000	77	60	1193	0	95	0	0	141	0	1568	371	1940

AS PERCENT OF TOTAL FOR EACH YEAR

1985	13.41	7.92	43.62	0.00	11.47	0.00	0.00	8.89	0.00	85.30	14.70	100
1986	5.72	8.01	56.62	0.00	9.58	0.00	0.00	10.30	0.00	90.23	9.77	100
1987	8.06	6.61	52.90	0.00	10.07	0.00	0.00	9.96	0.00	87.60	12.40	100
1988	8.05	6.06	53.09	0.00	9.69	0.00	0.00	9.74	0.00	86.63	13.37	100
1989	8.10	5.53	53.24	0.00	9.34	0.00	0.00	9.51	0.00	85.71	14.29	100
1990	8.17	5.01	53.35	0.00	9.03	0.00	0.00	9.28	0.00	84.83	15.17	100
1991	7.52	4.77	54.61	0.00	8.46	0.00	0.00	9.08	0.00	84.44	15.56	100
1992	6.93	4.55	55.77	0.00	7.94	0.00	0.00	8.87	0.00	84.06	15.94	100
1993	6.44	4.33	56.77	0.00	7.44	0.00	0.00	8.66	0.00	83.64	16.36	100
1994	5.98	4.12	57.70	0.00	6.99	0.00	0.00	8.45	0.00	83.24	16.76	100
1995	5.57	3.92	58.53	0.00	6.57	0.00	0.00	8.25	0.00	82.83	17.17	100
1996	5.19	3.74	59.29	0.00	6.19	0.00	0.00	8.05	0.00	82.45	17.55	100
1997	4.85	3.56	59.97	0.00	5.83	0.00	0.00	7.85	0.00	82.07	17.93	100
1998	4.54	3.40	60.55	0.00	5.50	0.00	0.00	7.66	0.00	81.65	18.35	100
1999	4.26	3.24	61.08	0.00	5.20	0.00	0.00	7.48	0.00	81.25	18.75	100
2000	4.00	3.10	61.54	0.00	4.91	0.00	0.00	7.30	0.00	80.85	19.15	100

INDEX 1986 = 1.00

1985	2.08	0.87	0.68	0.00	1.06	0.00	0.00	0.76	0.00	0.84	1.33	0.89
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.52	0.89	1.01	0.00	1.14	0.00	0.00	1.05	0.00	1.05	1.37	1.08
1988	1.66	0.89	1.11	0.00	1.19	0.00	0.00	1.11	0.00	1.13	1.61	1.18
1989	1.81	0.88	1.20	0.00	1.25	0.00	0.00	1.18	0.00	1.22	1.87	1.28
1990	1.94	0.85	1.28	0.00	1.28	0.00	0.00	1.23	0.00	1.28	2.11	1.36
1991	1.90	0.86	1.39	0.00	1.28	0.00	0.00	1.28	0.00	1.35	2.30	1.45
1992	1.88	0.88	1.53	0.00	1.29	0.00	0.00	1.34	0.00	1.45	2.53	1.55
1993	1.90	0.91	1.70	0.00	1.31	0.00	0.00	1.42	0.00	1.57	2.83	1.69
1994	1.92	0.94	1.87	0.00	1.34	0.00	0.00	1.50	0.00	1.69	3.14	1.83
1995	1.91	0.96	2.02	0.00	1.34	0.00	0.00	1.57	0.00	1.80	3.44	1.96
1996	1.88	0.97	2.17	0.00	1.34	0.00	0.00	1.62	0.00	1.90	3.72	2.07
1997	1.89	0.99	2.36	0.00	1.36	0.00	0.00	1.70	0.00	2.03	4.10	2.23
1998	1.90	1.02	2.56	0.00	1.37	0.00	0.00	1.78	0.00	2.17	4.49	2.39
1999	1.93	1.05	2.79	0.00	1.40	0.00	0.00	1.88	0.00	2.33	4.97	2.59
2000	1.94	1.07	3.01	0.00	1.42	0.00	0.00	1.97	0.00	2.49	5.44	2.77

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE TOYS,SPORTS, AND HOBBIES MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	47	95	43	0	186	0	0	17	0	388	367	755
1986	39	80	57	0	213	0	0	17	0	406	115	521
1987	42	88	61	0	229	0	0	20	0	442	263	706
1988	44	94	66	0	242	0	0	21	0	469	329	798
1989	45	97	68	0	249	0	0	22	0	482	388	871
1990	45	97	69	0	249	0	0	22	0	483	436	920
1991	43	96	70	0	247	0	0	22	0	480	447	928
1992	43	96	72	0	250	0	0	22	0	484	463	948
1993	43	98	74	0	255	0	0	22	0	494	484	979
1994	43	99	76	0	258	0	0	22	0	500	500	1001
1995	42	97	77	0	256	0	0	22	0	496	506	1003
1996	41	96	77	0	255	0	0	21	0	493	511	1004
1997	42	97	79	0	258	0	0	22	0	499	525	1024
1998	41	97	80	0	257	0	0	21	0	498	531	1030
1999	41	98	82	0	262	0	0	22	0	508	548	1056
2000	41	98	83	0	262	0	0	22	0	507	554	1061
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	6.23	12.58	5.70	0.00	24.64	0.00	0.00	2.25	0.00	51.39	48.61	100
1986	7.48	15.36	10.94	0.00	40.88	0.00	0.00	3.26	0.00	77.93	22.07	100
1987	6.07	12.58	8.69	0.00	32.47	0.00	0.00	2.86	0.00	62.68	37.32	100
1988	5.61	11.80	8.27	0.00	30.40	0.00	0.00	2.70	0.00	58.76	41.24	100
1989	5.23	11.14	7.89	0.00	28.61	0.00	0.00	2.57	0.00	55.44	44.56	100
1990	4.90	10.59	7.55	0.00	27.05	0.00	0.00	2.48	0.00	52.58	47.42	100
1991	4.73	10.39	7.58	0.00	26.70	0.00	0.00	2.41	0.00	51.80	48.20	100
1992	4.58	10.21	7.61	0.00	26.38	0.00	0.00	2.35	0.00	51.13	48.87	100
1993	4.46	10.04	7.64	0.00	26.08	0.00	0.00	2.30	0.00	50.52	49.48	100
1994	4.36	9.89	7.67	0.00	25.82	0.00	0.00	2.25	0.00	49.99	50.01	100
1995	4.26	9.76	7.70	0.00	25.59	0.00	0.00	2.21	0.00	49.52	50.48	100
1996	4.17	9.64	7.74	0.00	25.38	0.00	0.00	2.17	0.00	49.11	50.89	100
1997	4.10	9.54	7.78	0.00	25.20	0.00	0.00	2.14	0.00	48.75	51.25	100
1998	4.03	9.43	7.81	0.00	25.02	0.00	0.00	2.12	0.00	48.40	51.60	100
1999	3.96	9.35	7.84	0.00	24.86	0.00	0.00	2.09	0.00	48.10	51.90	100
2000	3.91	9.26	7.88	0.00	24.72	0.00	0.00	2.07	0.00	47.83	52.17	100
INDEX 1986 = 1.00												
1985	1.21	1.19	0.75	0.00	0.87	0.00	0.00	1.00	0.00	0.96	3.19	1.45
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	1.10	1.11	1.08	0.00	1.08	0.00	0.00	1.19	0.00	1.09	2.29	1.36
1988	1.15	1.18	1.16	0.00	1.14	0.00	0.00	1.27	0.00	1.16	2.86	1.53
1989	1.17	1.21	1.21	0.00	1.17	0.00	0.00	1.32	0.00	1.19	3.37	1.67
1990	1.16	1.22	1.22	0.00	1.17	0.00	0.00	1.34	0.00	1.19	3.79	1.77
1991	1.13	1.21	1.23	0.00	1.16	0.00	0.00	1.31	0.00	1.18	3.89	1.78
1992	1.11	1.21	1.27	0.00	1.17	0.00	0.00	1.31	0.00	1.19	4.03	1.82
1993	1.12	1.23	1.31	0.00	1.20	0.00	0.00	1.32	0.00	1.22	4.21	1.88
1994	1.12	1.24	1.35	0.00	1.21	0.00	0.00	1.33	0.00	1.23	4.35	1.92
1995	1.10	1.22	1.36	0.00	1.21	0.00	0.00	1.30	0.00	1.22	4.40	1.93
1996	1.08	1.21	1.36	0.00	1.20	0.00	0.00	1.29	0.00	1.22	4.45	1.93
1997	1.08	1.22	1.40	0.00	1.21	0.00	0.00	1.29	0.00	1.23	4.57	1.97
1998	1.06	1.22	1.41	0.00	1.21	0.00	0.00	1.28	0.00	1.23	4.62	1.98
1999	1.07	1.23	1.45	0.00	1.23	0.00	0.00	1.30	0.00	1.25	4.77	2.03
2000	1.06	1.23	1.47	0.00	1.23	0.00	0.00	1.29	0.00	1.25	4.82	2.04

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE ALL OTHER CONSUMER AND INSTIT MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	170	314	241	0	154	0	0	155	0	1027	378	1405
1986	233	590	210	0	200	0	0	185	0	1408	77	1485
1987	218	526	210	0	187	0	0	187	0	1321	324	1645
1988	215	556	217	0	189	0	0	187	0	1355	412	1768
1989	212	588	224	0	189	0	0	188	0	1391	503	1895
1990	205	611	226	0	186	0	0	185	0	1402	586	1988
1991	202	672	230	0	188	0	0	181	0	1461	630	2091
1992	201	741	236	0	190	0	0	179	0	1533	678	2212
1993	202	825	245	0	196	0	0	179	0	1634	742	2377
1994	201	898	249	0	198	0	0	177	0	1709	794	2503
1995	198	972	253	0	199	0	0	174	0	1783	847	2630
1996	195	1039	254	0	198	0	0	169	0	1841	893	2734
1997	196	1132	262	0	203	0	0	170	0	1947	961	2909
1998	193	1204	263	0	202	0	0	166	0	2014	1013	3027
1999	193	1297	269	0	205	0	0	166	0	2116	1082	3198
2000	191	1378	273	0	206	0	0	164	0	2196	1141	3338
					AS PERCENT OF TOTAL FOR EACH YEAR							
1985	12.12	22.35	17.15	0.00	10.96	0.00	0.00	11.03	0.00	73.10	26.90	100
1986	15.68	39.71	14.13	0.00	13.46	0.00	0.00	12.45	0.00	94.76	5.24	100
1987	13.27	31.98	12.79	0.00	11.42	0.00	0.00	11.42	0.00	80.28	19.72	100
1988	12.19	31.47	12.29	0.00	10.70	0.00	0.00	10.62	0.00	76.66	23.34	100
1989	11.20	31.06	11.82	0.00	10.02	0.00	0.00	9.93	0.00	73.42	26.58	100
1990	10.31	30.72	11.37	0.00	9.38	0.00	0.00	9.33	0.00	70.50	29.50	100
1991	9.68	32.14	11.02	0.00	9.00	0.00	0.00	8.69	0.00	69.88	30.12	100
1992	9.09	33.49	10.67	0.00	8.63	0.00	0.00	8.10	0.00	69.31	30.69	100
1993	8.53	34.72	10.31	0.00	8.26	0.00	0.00	7.56	0.00	68.76	31.24	100
1994	8.03	35.89	9.97	0.00	7.92	0.00	0.00	7.07	0.00	68.26	31.74	100
1995	7.56	36.98	9.63	0.00	7.58	0.00	0.00	6.62	0.00	67.78	32.22	100
1996	7.13	37.99	9.32	0.00	7.27	0.00	0.00	6.21	0.00	67.35	32.65	100
1997	6.74	38.93	9.01	0.00	6.98	0.00	0.00	5.84	0.00	66.94	33.06	100
1998	6.37	39.78	8.72	0.00	6.70	0.00	0.00	5.50	0.00	66.53	33.47	100
1999	6.04	40.57	8.44	0.00	6.43	0.00	0.00	5.20	0.00	66.16	33.84	100
2000	5.74	41.29	8.18	0.00	6.19	0.00	0.00	4.92	0.00	65.80	34.20	100
					INDEX 1986 = 1.00							
1985	0.73	0.53	1.15	0.00	0.77	0.00	0.00	0.84	0.00	0.73	4.85	0.95
1986	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00
1987	0.94	0.89	1.00	0.00	0.94	0.00	0.00	1.02	0.00	0.94	4.17	1.11
1988	0.92	0.94	1.03	0.00	0.95	0.00	0.00	1.01	0.00	0.96	5.30	1.19
1989	0.91	1.00	1.07	0.00	0.95	0.00	0.00	1.02	0.00	0.99	6.47	1.28
1990	0.88	1.04	1.08	0.00	0.93	0.00	0.00	1.00	0.00	1.00	7.53	1.34
1991	0.87	1.14	1.10	0.00	0.94	0.00	0.00	0.98	0.00	1.04	8.09	1.41
1992	0.86	1.26	1.12	0.00	0.95	0.00	0.00	0.97	0.00	1.09	8.72	1.49
1993	0.87	1.40	1.17	0.00	0.98	0.00	0.00	0.97	0.00	1.16	9.54	1.60
1994	0.86	1.52	1.19	0.00	0.99	0.00	0.00	0.96	0.00	1.21	10.21	1.69
1995	0.85	1.65	1.21	0.00	1.00	0.00	0.00	0.94	0.00	1.27	10.88	1.77
1996	0.84	1.76	1.21	0.00	0.99	0.00	0.00	0.92	0.00	1.31	11.47	1.84
1997	0.84	1.92	1.25	0.00	1.01	0.00	0.00	0.92	0.00	1.38	12.35	1.96
1998	0.83	2.04	1.26	0.00	1.01	0.00	0.00	0.90	0.00	1.43	13.01	2.04
1999	0.83	2.20	1.29	0.00	1.03	0.00	0.00	0.90	0.00	1.50	13.90	2.15
2000	0.82	2.34	1.30	0.00	1.03	0.00	0.00	0.89	0.00	1.56	14.66	2.25

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE INDUSTRIAL/MACHINERY MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	0	0	0	0	32	30	37	99	230	329
1986	0	0	0	0	0	0	32	17	48	97	232	329
1987	0	0	0	0	0	0	37	19	44	102	258	361
1988	0	0	0	0	0	0	43	20	45	109	284	394
1989	0	0	0	0	0	0	49	22	46	117	313	431
1990	0	0	0	0	0	0	52	22	43	118	322	441
1991	0	0	0	0	0	0	54	22	42	119	329	450
1992	0	0	0	0	0	0	58	22	42	123	347	472
1993	0	0	0	0	0	0	64	23	44	131	374	506
1994	0	0	0	0	0	0	68	23	44	137	396	533
1995	0	0	0	0	0	0	72	23	44	139	410	550
1996	0	0	0	0	0	0	75	22	43	141	421	563
1997	0	0	0	0	0	0	80	23	44	148	447	595
1998	0	0	0	0	0	0	85	23	44	154	471	623
1999	0	0	0	0	0	0	93	24	46	163	506	667
2000	0	0	0	0	0	0	97	24	45	168	528	692

AS PERCENT OF TOTAL FOR EACH YEAR

1985	0.00	0.00	0.00	0.00	0.00	0.00	9.73	9.12	11.25	30.09	69.91	100
1986	0.00	0.00	0.00	0.00	0.00	0.00	9.73	5.17	14.59	29.48	70.71	100
1987	0.00	0.00	0.00	0.00	0.00	0.00	10.50	5.39	12.41	28.30	71.65	100
1988	0.00	0.00	0.00	0.00	0.00	0.00	10.95	5.29	11.53	27.77	72.14	100
1989	0.00	0.00	0.00	0.00	0.00	0.00	11.39	5.20	10.68	27.27	72.57	100
1990	0.00	0.00	0.00	0.00	0.00	0.00	11.82	5.12	9.84	26.78	72.98	100
1991	0.00	0.00	0.00	0.00	0.00	0.00	12.12	4.93	9.45	26.49	73.26	100
1992	0.00	0.00	0.00	0.00	0.00	0.00	12.39	4.74	9.08	26.21	73.55	100
1993	0.00	0.00	0.00	0.00	0.00	0.00	12.66	4.56	8.72	25.94	73.90	100
1994	0.00	0.00	0.00	0.00	0.00	0.00	12.91	4.39	8.38	25.67	74.21	100
1995	0.00	0.00	0.00	0.00	0.00	0.00	13.14	4.22	8.05	25.42	74.55	100
1996	0.00	0.00	0.00	0.00	0.00	0.00	13.36	4.06	7.74	25.17	74.86	100
1997	0.00	0.00	0.00	0.00	0.00	0.00	13.57	3.91	7.44	24.93	75.17	100
1998	0.00	0.00	0.00	0.00	0.00	0.00	13.77	3.77	7.16	24.69	75.53	100
1999	0.00	0.00	0.00	0.00	0.00	0.00	13.95	3.63	6.89	24.47	75.86	100
2000	0.00	0.00	0.00	0.00	0.00	0.00	14.12	3.49	6.63	24.25	76.21	100

INDEX 1986 = 1.00

1985	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.76	0.77	1.02	0.99	1.00
1986	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
1987	0.00	0.00	0.00	0.00	0.00	0.00	1.19	1.15	0.93	1.05	1.11	1.10
1988	0.00	0.00	0.00	0.00	0.00	0.00	1.35	1.23	0.95	1.13	1.22	1.20
1989	0.00	0.00	0.00	0.00	0.00	0.00	1.54	1.32	0.96	1.21	1.35	1.31
1990	0.00	0.00	0.00	0.00	0.00	0.00	1.63	1.33	0.90	1.22	1.38	1.34
1991	0.00	0.00	0.00	0.00	0.00	0.00	1.70	1.30	0.89	1.23	1.42	1.37
1992	0.00	0.00	0.00	0.00	0.00	0.00	1.83	1.32	0.89	1.28	1.49	1.44
1993	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.36	0.92	1.35	1.61	1.54
1994	0.00	0.00	0.00	0.00	0.00	0.00	2.15	1.38	0.93	1.41	1.70	1.62
1995	0.00	0.00	0.00	0.00	0.00	0.00	2.26	1.37	0.92	1.44	1.76	1.67
1996	0.00	0.00	0.00	0.00	0.00	0.00	2.35	1.35	0.91	1.46	1.81	1.71
1997	0.00	0.00	0.00	0.00	0.00	0.00	2.52	1.37	0.92	1.53	1.92	1.81
1998	0.00	0.00	0.00	0.00	0.00	0.00	2.68	1.38	0.93	1.59	2.03	1.90
1999	0.00	0.00	0.00	0.00	0.00	0.00	2.91	1.42	0.96	1.68	2.18	2.03
2000	0.00	0.00	0.00	0.00	0.00	0.00	3.06	1.42	0.96	1.73	2.27	2.11

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE ADHESIVES, INKS, COATINGS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	0	0	0	0	0	0	0	89	886	975	452	1427
1986	0	0	0	0	0	0	0	83	583	666	689	1353
1987	0	0	0	0	0	0	0	82	709	791	651	1444
1988	0	0	0	0	0	0	0	83	757	841	668	1511
1989	0	0	0	0	0	0	0	82	793	876	672	1551
1990	0	0	0	0	0	0	0	80	818	898	664	1566
1991	0	0	0	0	0	0	0	79	805	885	684	1572
1992	0	0	0	0	0	0	0	79	805	884	713	1602
1993	0	0	0	0	0	0	0	79	812	892	751	1646
1994	0	0	0	0	0	0	0	79	811	891	781	1674
1995	0	0	0	0	0	0	0	77	798	876	800	1677
1996	0	0	0	0	0	0	0	76	790	867	822	1688
1997	0	0	0	0	0	0	0	77	794	872	857	1728
1998	0	0	0	0	0	0	0	77	794	871	889	1757
1999	0	0	0	0	0	0	0	77	799	876	926	1797
2000	0	0	0	0	0	0	0	77	795	873	955	1820
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.24	62.09	68.33	31.67	100
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.13	43.09	49.22	50.97	100
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.69	49.14	54.83	45.12	100
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.52	50.13	55.65	44.26	100
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.34	51.15	56.49	43.35	100
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.14	52.21	57.36	42.41	100
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.04	51.23	56.27	43.49	100
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.93	50.29	55.22	44.54	100
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.83	49.37	54.20	45.63	100
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.74	48.48	53.22	46.67	100
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.64	47.62	52.27	47.69	100
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.56	46.79	51.35	48.67	100
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.47	45.99	50.46	49.63	100
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.39	45.21	49.60	50.62	100
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.31	44.46	48.77	51.56	100
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24	43.73	47.97	52.48	100
INDEX 1986 = 1.00												
1985	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	1.52	1.46	0.66	1.05
1986	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
1987	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	1.22	1.19	0.94	1.07
1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	1.30	1.26	0.97	1.12
1989	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.36	1.32	0.98	1.15
1990	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	1.40	1.35	0.96	1.16
1991	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	1.38	1.33	0.99	1.16
1992	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	1.38	1.33	1.04	1.18
1993	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	1.39	1.34	1.09	1.22
1994	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	1.39	1.34	1.13	1.24
1995	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.94	1.37	1.32	1.16	1.24
1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.36	1.30	1.19	1.25
1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.36	1.31	1.24	1.28
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.36	1.31	1.29	1.30
1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.37	1.32	1.34	1.33
2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.37	1.31	1.39	1.35

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE RESELLERS AND COMPOUNDERS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	559	589	834	150	576	27	25	238	230	3228	0	3228
1986	511	487	946	137	564	40	22	262	95	3064	0	3064
1987	536	541	940	153	515	25	28	262	141	3144	0	3144
1988	577	583	1024	172	527	22	32	275	167	3382	0	3382
1989	599	606	1072	187	517	18	35	277	190	3504	0	3504
1990	603	613	1092	197	491	13	38	272	208	3531	0	3531
1991	611	612	1144	207	490	12	39	271	217	3607	0	3607
1992	629	621	1216	222	497	12	41	274	229	3744	0	3744
1993	656	636	1305	239	509	13	44	280	244	3930	0	3930
1994	676	644	1383	255	515	13	46	283	257	4074	0	4074
1995	686	643	1443	267	515	12	48	282	266	4165	0	4165
1996	695	642	1502	279	513	12	50	280	275	4251	0	4251
1997	718	652	1592	297	522	12	52	284	290	4424	0	4424
1998	735	657	1670	313	525	12	54	286	302	4558	0	4558
1999	763	671	1777	335	536	13	57	291	319	4766	0	4766
2000	779	674	1856	351	539	13	59	292	331	4897	0	4897
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	17.32	18.25	25.84	4.65	17.84	0.84	0.77	7.37	7.13	100.00	0.00	100
1986	16.68	15.89	30.88	4.47	18.41	1.31	0.72	8.55	3.10	100.00	0.00	100
1987	17.07	17.21	29.92	4.87	16.38	0.81	0.89	8.35	4.49	100.00	0.00	100
1988	17.08	17.24	30.27	5.11	15.58	0.67	0.95	8.14	4.95	100.00	0.00	100
1989	17.09	17.30	30.61	5.35	14.76	0.52	1.02	7.93	5.42	100.00	0.00	100
1990	17.10	17.38	30.93	5.59	13.92	0.37	1.08	7.72	5.91	100.00	0.00	100
1991	16.95	16.98	31.71	5.76	13.60	0.35	1.10	7.52	6.02	100.00	0.00	100
1992	16.82	16.59	32.48	5.93	13.28	0.34	1.12	7.32	6.12	100.00	0.00	100
1993	16.71	16.20	33.22	6.10	12.97	0.33	1.13	7.13	6.22	100.00	0.00	100
1994	16.59	15.82	33.94	6.26	12.66	0.32	1.15	6.95	6.31	100.00	0.00	100
1995	16.47	15.46	34.65	6.42	12.37	0.31	1.16	6.77	6.39	100.00	0.00	100
1996	16.35	15.10	35.34	6.57	12.08	0.30	1.18	6.60	6.48	100.00	0.00	100
1997	16.24	14.75	36.00	6.73	11.80	0.29	1.19	6.44	6.56	100.00	0.00	100
1998	16.13	14.42	36.65	6.88	11.53	0.28	1.20	6.28	6.63	100.00	0.00	100
1999	16.02	14.09	37.28	7.03	11.26	0.27	1.21	6.12	6.70	100.00	0.00	100
2000	15.91	13.77	37.90	7.18	11.01	0.26	1.22	5.98	6.77	100.00	0.00	100
INDEX 1986 = 1.00												
1985	1.09	1.21	0.88	1.09	1.02	0.67	1.14	0.91	2.42	1.05	0.00	1.05
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
1987	1.05	1.11	0.99	1.12	0.91	0.64	1.28	1.00	1.49	1.03	0.00	1.03
1988	1.13	1.20	1.08	1.26	0.93	0.57	1.47	1.05	1.76	1.10	0.00	1.10
1989	1.17	1.25	1.13	1.37	0.92	0.46	1.62	1.06	2.00	1.14	0.00	1.14
1990	1.18	1.26	1.15	1.44	0.87	0.32	1.74	1.04	2.20	1.15	0.00	1.15
1991	1.20	1.26	1.21	1.52	0.87	0.32	1.80	1.04	2.29	1.18	0.00	1.18
1992	1.23	1.28	1.29	1.62	0.88	0.32	1.90	1.05	2.41	1.22	0.00	1.22
1993	1.29	1.31	1.38	1.75	0.90	0.32	2.02	1.07	2.57	1.28	0.00	1.28
1994	1.32	1.32	1.46	1.86	0.91	0.33	2.12	1.08	2.71	1.33	0.00	1.33
1995	1.34	1.32	1.53	1.95	0.91	0.32	2.20	1.08	2.80	1.36	0.00	1.36
1996	1.36	1.32	1.59	2.04	0.91	0.32	2.27	1.07	2.90	1.39	0.00	1.39
1997	1.41	1.34	1.68	2.17	0.93	0.32	2.39	1.09	3.05	1.44	0.00	1.44
1998	1.44	1.35	1.77	2.29	0.93	0.32	2.49	1.09	3.18	1.49	0.00	1.49
1999	1.49	1.38	1.88	2.45	0.95	0.32	2.63	1.11	3.36	1.56	0.00	1.56
2000	1.53	1.38	1.96	2.57	0.96	0.32	2.72	1.12	3.49	1.60	0.00	1.60

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE UNCLASSIFIED SALES MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	272	254	263	50	249	5	3	141	103	1340	0	1340
1986	249	202	216	10	250	20	2	188	30	1167	0	1167
1987	238	202	263	18	299	13	2	219	54	1310	0	1310
1988	252	211	304	20	340	11	2	247	67	1457	0	1457
1989	256	212	337	23	371	9	2	269	80	1562	0	1562
1990	252	207	361	25	394	6	2	285	92	1627	0	1627
1991	257	204	380	24	410	6	2	298	98	1683	0	1683
1992	267	206	405	24	433	6	2	316	107	1769	0	1769
1993	279	209	435	24	462	6	2	339	118	1878	0	1878
1994	288	210	461	24	486	6	2	359	129	1968	0	1968
1995	294	209	480	23	504	5	2	375	138	2033	0	2033
1996	298	207	498	23	522	5	2	390	149	2097	0	2097
1997	309	209	525	23	550	5	2	414	163	2204	0	2204
1998	317	209	548	22	574	5	2	435	178	2293	0	2293
1999	329	213	579	23	607	5	2	464	198	2421	0	2421
2000	336	212	600	22	630	5	2	486	216	2513	0	2513

AS PERCENT OF TOTAL FOR EACH YEAR

1985	20.30	18.96	19.63	3.73	18.58	0.37	0.22	10.52	7.69	100.00	0.00	100
1986	21.34	17.31	18.51	0.86	21.42	1.71	0.17	16.11	2.57	100.00	0.00	100
1987	18.21	15.45	20.07	1.40	22.85	0.99	0.17	16.71	4.14	100.00	0.00	100
1988	17.30	14.48	20.86	1.43	23.33	0.79	0.16	17.00	4.65	100.00	0.00	100
1989	16.40	13.58	21.58	1.48	23.79	0.59	0.15	17.27	5.16	100.00	0.00	100
1990	15.51	12.73	22.23	1.54	24.22	0.40	0.15	17.55	5.68	100.00	0.00	100
1991	15.30	12.17	22.61	1.45	24.36	0.37	0.14	17.72	5.87	100.00	0.00	100
1992	15.09	11.65	22.94	1.36	24.49	0.35	0.13	17.90	6.08	100.00	0.00	100
1993	14.88	11.16	23.21	1.29	24.61	0.33	0.12	18.08	6.31	100.00	0.00	100
1994	14.67	10.71	23.44	1.22	24.71	0.31	0.12	18.26	6.56	100.00	0.00	100
1995	14.46	10.28	23.62	1.16	24.81	0.29	0.11	18.45	6.82	100.00	0.00	100
1996	14.25	9.88	23.75	1.10	24.89	0.28	0.10	18.63	7.12	100.00	0.00	100
1997	14.04	9.50	23.84	1.05	24.97	0.26	0.10	18.81	7.44	100.00	0.00	100
1998	13.82	9.14	23.90	1.00	25.03	0.25	0.09	18.99	7.79	100.00	0.00	100
1999	13.61	8.80	23.91	0.95	25.07	0.24	0.09	19.17	8.18	100.00	0.00	100
2000	13.39	8.47	23.89	0.91	25.09	0.23	0.09	19.34	8.61	100.00	0.00	100

INDEX 1986 = 1.00

1985	1.09	1.26	1.22	5.00	1.00	0.25	1.50	0.75	3.43	1.15	0.00	1.15
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
1987	0.96	1.00	1.22	1.83	1.20	0.65	1.13	1.16	1.81	1.12	0.00	1.12
1988	1.01	1.05	1.41	2.08	1.36	0.57	1.18	1.32	2.26	1.25	0.00	1.25
1989	1.03	1.05	1.56	2.31	1.49	0.46	1.21	1.44	2.69	1.34	0.00	1.34
1990	1.01	1.03	1.67	2.51	1.58	0.33	1.21	1.52	3.08	1.39	0.00	1.39
1991	1.03	1.01	1.76	2.44	1.64	0.31	1.17	1.59	3.30	1.44	0.00	1.44
1992	1.07	1.02	1.88	2.41	1.73	0.31	1.15	1.68	3.59	1.52	0.00	1.52
1993	1.12	1.04	2.02	2.42	1.85	0.31	1.16	1.81	3.95	1.61	0.00	1.61
1994	1.16	1.04	2.14	2.40	1.95	0.30	1.14	1.91	4.30	1.69	0.00	1.69
1995	1.18	1.03	2.22	2.35	2.02	0.30	1.12	2.00	4.63	1.74	0.00	1.74
1996	1.20	1.03	2.31	2.30	2.09	0.29	1.09	2.08	4.97	1.80	0.00	1.80
1997	1.24	1.04	2.43	2.30	2.20	0.29	1.09	2.20	5.46	1.89	0.00	1.89
1998	1.27	1.04	2.54	2.28	2.30	0.29	1.08	2.32	5.95	1.97	0.00	1.97
1999	1.32	1.05	2.68	2.30	2.43	0.29	1.09	2.47	6.60	2.08	0.00	2.08
2000	1.35	1.05	2.78	2.28	2.52	0.28	1.08	2.59	7.21	2.15	0.00	2.15

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE EXPORTS MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	1131	877	875	149	84	35	24	292	621	4088	0	4088
1986	939	924	1130	158	114	73	39	370	241	3988	0	3988
1987	1182	1057	1267	185	107	51	37	438	452	4780	0	4780
1988	1471	1311	1584	237	119	51	43	532	603	5955	0	5955
1989	1644	1461	1778	272	117	44	45	580	717	6663	0	6663
1990	1711	1516	1860	290	107	33	43	590	790	6944	0	6944
1991	1749	1587	1979	312	104	32	44	595	805	7210	0	7210
1992	1815	1686	2134	340	102	32	45	609	834	7603	0	7603
1993	1917	1823	2340	376	103	32	48	635	879	8157	0	8157
1994	2012	1956	2544	412	103	32	50	658	921	8691	0	8691
1995	2104	2091	2754	449	103	33	52	679	961	9230	0	9230
1996	2178	2210	2946	482	102	32	54	694	993	9695	0	9695
1997	2284	2366	3188	523	102	33	57	718	1039	10314	0	10314
1998	2407	2544	3462	570	104	33	60	747	1093	11024	0	11024
1999	2561	2760	3791	625	106	34	63	785	1161	11891	0	11891
2000	2708	2972	4118	679	108	35	67	820	1225	12735	0	12735

AS PERCENT OF TOTAL FOR EACH YEAR

1985	27.67	21.45	21.40	3.64	2.05	0.86	0.59	7.14	15.19	100.00	0.00	100
1986	23.55	23.17	28.34	3.96	2.86	1.83	0.98	9.28	6.04	100.00	0.00	100
1987	24.73	22.12	26.52	3.88	2.25	1.08	0.79	9.17	9.46	100.00	0.00	100
1988	24.71	22.03	26.61	3.98	2.00	0.87	0.73	8.94	10.14	100.00	0.00	100
1989	24.68	21.93	26.70	4.08	1.77	0.67	0.68	8.72	10.77	100.00	0.00	100
1990	24.65	21.84	26.79	4.18	1.55	0.48	0.63	8.51	11.38	100.00	0.00	100
1991	24.26	22.02	27.45	4.33	1.45	0.45	0.61	8.26	11.18	100.00	0.00	100
1992	23.88	22.19	28.08	4.48	1.35	0.42	0.60	8.02	10.98	100.00	0.00	100
1993	23.51	22.35	28.69	4.61	1.27	0.40	0.59	7.79	10.79	100.00	0.00	100
1994	23.15	22.51	29.28	4.74	1.19	0.38	0.58	7.57	10.60	100.00	0.00	100
1995	22.80	22.66	29.84	4.86	1.12	0.36	0.57	7.36	10.42	100.00	0.00	100
1996	22.47	22.80	30.39	4.98	1.06	0.34	0.56	7.16	10.25	100.00	0.00	100
1997	22.15	22.94	30.91	5.08	1.00	0.32	0.55	6.97	10.08	100.00	0.00	100
1998	21.84	23.08	31.41	5.17	0.94	0.31	0.55	6.78	9.92	100.00	0.00	100
1999	21.54	23.21	31.89	5.26	0.90	0.29	0.54	6.61	9.77	100.00	0.00	100
2000	21.26	23.34	32.34	5.34	0.85	0.28	0.53	6.44	9.62	100.00	0.00	100

INDEX 1986 = 1.00

1985	1.20	0.95	0.77	0.94	0.74	0.48	0.62	0.79	2.58	1.03	0.00	1.03
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
1987	1.26	1.14	1.12	1.17	0.95	0.71	0.96	1.18	1.88	1.20	0.00	1.20
1988	1.57	1.42	1.40	1.50	1.04	0.71	1.12	1.44	2.51	1.49	0.00	1.49
1989	1.75	1.58	1.57	1.72	1.03	0.61	1.16	1.57	2.98	1.67	0.00	1.67
1990	1.82	1.64	1.65	1.84	0.95	0.45	1.11	1.60	3.28	1.74	0.00	1.74
1991	1.86	1.72	1.75	1.98	0.92	0.44	1.14	1.61	3.34	1.81	0.00	1.81
1992	1.93	1.83	1.89	2.15	0.90	0.44	1.18	1.65	3.46	1.91	0.00	1.91
1993	2.04	1.97	2.07	2.38	0.91	0.45	1.24	1.72	3.65	2.05	0.00	2.05
1994	2.14	2.12	2.25	2.61	0.91	0.45	1.30	1.78	3.82	2.18	0.00	2.18
1995	2.24	2.26	2.44	2.84	0.91	0.45	1.36	1.84	3.99	2.31	0.00	2.31
1996	2.32	2.39	2.61	3.05	0.90	0.45	1.40	1.88	4.12	2.43	0.00	2.43
1997	2.43	2.56	2.82	3.32	0.90	0.46	1.47	1.94	4.31	2.59	0.00	2.59
1998	2.56	2.75	3.06	3.61	0.91	0.46	1.54	2.02	4.54	2.76	0.00	2.76
1999	2.73	2.99	3.36	3.96	0.93	0.48	1.64	2.12	4.82	2.98	0.00	2.98
2000	2.88	3.22	3.64	4.30	0.95	0.49	1.73	2.22	5.08	3.19	0.00	3.19

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE TOTAL AVAILABLE MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	9113	6464	5215	1005	4096	394	331	6719	3715	37052	0	37052
1986	9069	6857	5769	989	4409	495	358	7412	1477	36835	0	36835
1987	9916	7502	6300	1056	4415	465	398	7551	2414	40021	0	40021
1988	10657	8349	7107	1169	4628	478	455	8138	2866	43851	0	43851
1989	11177	8997	7678	1233	4745	475	496	8540	3257	46600	0	46600
1990	11449	9450	8016	1252	4763	459	519	8787	3565	48264	0	48264
1991	11638	9951	8420	1278	4857	463	548	9138	3625	49921	0	49921
1992	11965	10590	8955	1331	5010	474	589	9715	3742	52375	0	52375
1993	12463	11343	9620	1404	5210	490	639	10219	3915	55307	0	55307
1994	12836	12008	10203	1462	5362	498	679	10662	4051	57764	0	57764
1995	13086	12573	10699	1503	5454	499	708	10990	4146	59661	0	59661
1996	13317	13117	11169	1542	5540	500	739	11355	4228	61511	0	61511
1997	13743	13870	11849	1616	5708	512	790	12089	4392	64574	0	64574
1998	14053	14527	12477	1681	5844	518	828	12511	4537	66980	0	66980
1999	14553	15380	13286	1778	6032	529	892	13046	4739	70240	0	70240
2000	14879	16063	13968	1846	6160	535	927	13520	4894	72795	0	72795
AS PERCENT OF TOTAL FOR EACH YEAR												
1985	24.60	17.45	14.07	2.71	11.05	1.06	0.89	18.13	10.03	100.00	0.00	100
1986	24.62	18.62	15.66	2.68	11.97	1.34	0.97	20.12	4.01	100.00	0.00	100
1987	24.78	18.75	15.74	2.64	11.03	1.16	1.00	18.87	6.03	100.00	0.00	100
1988	24.30	19.04	16.21	2.67	10.55	1.09	1.04	18.56	6.54	100.00	0.00	100
1989	23.98	19.31	16.48	2.65	10.18	1.02	1.06	18.33	6.99	100.00	0.00	100
1990	23.72	19.58	16.61	2.60	9.87	0.95	1.08	18.21	7.39	100.00	0.00	100
1991	23.31	19.93	16.87	2.56	9.73	0.93	1.10	18.31	7.26	100.00	0.00	100
1992	22.85	20.22	17.10	2.54	9.57	0.91	1.13	18.55	7.15	100.00	0.00	100
1993	22.54	20.51	17.40	2.54	9.42	0.89	1.16	18.48	7.08	100.00	0.00	100
1994	22.22	20.79	17.66	2.53	9.28	0.86	1.18	18.46	7.01	100.00	0.00	100
1995	21.93	21.08	17.93	2.52	9.14	0.84	1.19	18.42	6.95	100.00	0.00	100
1996	21.65	21.33	18.16	2.51	9.01	0.81	1.20	18.46	6.87	100.00	0.00	100
1997	21.28	21.48	18.35	2.50	8.84	0.79	1.22	18.72	6.80	100.00	0.00	100
1998	20.98	21.69	18.63	2.51	8.72	0.77	1.24	18.68	6.77	100.00	0.00	100
1999	20.72	21.90	18.92	2.53	8.59	0.75	1.27	18.57	6.75	100.00	0.00	100
2000	20.44	22.07	19.19	2.54	8.46	0.73	1.27	18.57	6.72	100.00	0.00	100
INDEX 1986 = 1.00												
1985	1.00	0.94	0.90	1.02	0.93	0.80	0.92	0.91	2.52	1.01	0.00	1.01
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
1987	1.09	1.09	1.09	1.07	1.00	0.94	1.11	1.02	1.63	1.09	0.00	1.09
1988	1.18	1.22	1.23	1.18	1.05	0.97	1.27	1.10	1.94	1.19	0.00	1.19
1989	1.23	1.31	1.33	1.25	1.08	0.96	1.39	1.15	2.21	1.27	0.00	1.27
1990	1.26	1.38	1.39	1.27	1.08	0.93	1.45	1.19	2.41	1.31	0.00	1.31
1991	1.28	1.45	1.46	1.29	1.10	0.94	1.53	1.23	2.45	1.36	0.00	1.36
1992	1.32	1.54	1.55	1.35	1.14	0.96	1.65	1.31	2.53	1.42	0.00	1.42
1993	1.37	1.65	1.67	1.42	1.18	0.99	1.79	1.38	2.65	1.50	0.00	1.50
1994	1.42	1.75	1.77	1.48	1.22	1.01	1.90	1.44	2.74	1.57	0.00	1.57
1995	1.44	1.83	1.85	1.52	1.24	1.01	1.98	1.48	2.81	1.62	0.00	1.62
1996	1.47	1.91	1.94	1.56	1.26	1.01	2.07	1.53	2.86	1.67	0.00	1.67
1997	1.52	2.02	2.05	1.63	1.29	1.04	2.21	1.63	2.97	1.75	0.00	1.75
1998	1.55	2.12	2.16	1.70	1.33	1.05	2.32	1.69	3.07	1.82	0.00	1.82
1999	1.60	2.24	2.30	1.80	1.37	1.07	2.49	1.76	3.21	1.91	0.00	1.91
2000	1.64	2.34	2.42	1.87	1.40	1.08	2.59	1.82	3.31	1.98	0.00	1.98

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE RESIDUAL MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	161	187	60	95	12	666	72	0	1382	0	7211	7211
1986	353	157	43	176	45	649	84	0	1387	0	7131	7131
1987	252	230	68	170	56	634	88	0	1923	0	7891	7891
1988	230	279	77	182	63	669	97	0	2284	0	8735	8735
1989	201	327	86	185	70	681	101	0	2600	0	9336	9336
1990	164	372	95	181	77	673	102	0	2851	0	9694	9694
1991	163	404	95	183	82	692	104	0	3079	0	10114	10114
1992	162	442	96	189	87	721	108	0	3364	0	10706	10706
1993	154	478	91	196	89	759	112	0	3708	0	11418	11418
1994	145	513	86	201	92	784	115	0	4034	0	12035	12035
1995	132	542	78	204	92	799	115	0	4326	0	12506	12506
1996	121	571	69	206	93	813	115	0	4615	0	12972	12972
1997	110	610	61	212	95	846	119	0	5004	0	13704	13704
1998	88	635	44	216	93	869	119	0	5378	0	14313	14313
1999	70	672	27	224	93	901	122	0	5836	0	15150	15150
2000	47	698	7	228	90	923	122	0	6247	0	15790	15790

AS PERCENT OF TOTAL FOR EACH YEAR

1985	2.23	2.59	0.83	1.32	0.17	9.23	1.00	0.00	19.16	0.00	100.00	100
1986	4.96	2.21	0.61	2.48	0.64	9.11	1.18	0.00	19.46	0.00	100.00	100
1987	3.20	2.93	0.86	2.16	0.71	8.04	1.13	0.00	24.38	0.00	100.00	100
1988	2.64	3.19	0.89	2.08	0.72	7.66	1.11	0.00	26.15	0.00	100.00	100
1989	2.15	3.51	0.93	1.99	0.76	7.30	1.09	0.00	27.85	0.00	100.00	100
1990	1.70	3.84	0.98	1.87	0.80	6.95	1.06	0.00	29.42	0.00	100.00	100
1991	1.61	4.00	0.94	1.82	0.81	6.85	1.03	0.00	30.44	0.00	100.00	100
1992	1.52	4.13	0.90	1.77	0.81	6.74	1.01	0.00	31.43	0.00	100.00	100
1993	1.35	4.19	0.80	1.72	0.79	6.65	0.99	0.00	32.48	0.00	100.00	100
1994	1.21	4.27	0.72	1.68	0.77	6.52	0.96	0.00	33.52	0.00	100.00	100
1995	1.06	4.33	0.62	1.63	0.74	6.39	0.92	0.00	34.60	0.00	100.00	100
1996	0.93	4.41	0.54	1.59	0.72	6.27	0.89	0.00	35.58	0.00	100.00	100
1997	0.80	4.45	0.45	1.55	0.70	6.18	0.87	0.00	36.52	0.00	100.00	100
1998	0.62	4.44	0.31	1.51	0.65	6.08	0.83	0.00	37.58	0.00	100.00	100
1999	0.46	4.44	0.18	1.48	0.62	5.95	0.81	0.00	38.52	0.00	100.00	100
2000	0.30	4.42	0.05	1.45	0.58	5.85	0.77	0.00	39.56	0.00	100.00	100

INDEX 1986 = 1.00

1985	0.46	1.19	1.37	0.54	0.26	1.02	0.86	0.00	1.00	0.00	1.01	1.01
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00
1987	0.71	1.47	1.56	0.96	1.24	0.98	1.06	0.00	1.39	0.00	1.11	1.11
1988	0.65	1.77	1.77	1.03	1.39	1.03	1.16	0.00	1.65	0.00	1.22	1.22
1989	0.57	2.08	1.98	1.05	1.56	1.05	1.21	0.00	1.87	0.00	1.31	1.31
1990	0.47	2.36	2.17	1.03	1.71	1.04	1.22	0.00	2.06	0.00	1.36	1.36
1991	0.46	2.57	2.18	1.04	1.80	1.07	1.24	0.00	2.22	0.00	1.42	1.42
1992	0.46	2.81	2.20	1.07	1.92	1.11	1.29	0.00	2.42	0.00	1.50	1.50
1993	0.44	3.04	2.09	1.11	1.97	1.17	1.34	0.00	2.67	0.00	1.60	1.60
1994	0.41	3.26	1.98	1.14	2.03	1.21	1.37	0.00	2.91	0.00	1.69	1.69
1995	0.38	3.44	1.78	1.15	2.04	1.23	1.37	0.00	3.12	0.00	1.75	1.75
1996	0.34	3.63	1.59	1.17	2.06	1.25	1.38	0.00	3.33	0.00	1.82	1.82
1997	0.31	3.87	1.40	1.20	2.11	1.30	1.41	0.00	3.61	0.00	1.92	1.92
1998	0.25	4.04	1.01	1.23	2.06	1.34	1.42	0.00	3.88	0.00	2.01	2.01
1999	0.20	4.27	0.63	1.27	2.05	1.39	1.46	0.00	4.21	0.00	2.12	2.12
2000	0.13	4.44	0.17	1.29	2.00	1.42	1.45	0.00	4.50	0.00	2.21	2.21

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE TOTAL MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	9274	6651	5275	1100	4108	1060	403	6720	5097	37052	7211	44263
1986	9423	7014	5812	1165	4454	1144	442	7397	2864	36835	7131	43967
1987	10169	7733	6368	1227	4471	1099	487	7555	4338	40021	7891	47912
1988	10888	8628	7184	1352	4691	1148	552	8146	5150	43851	8735	52587
1989	11378	9324	7765	1418	4816	1157	597	8554	5858	46600	9336	55937
1990	11614	9822	8111	1434	4841	1132	622	8808	6417	48264	9694	57959
1991	11802	10355	8515	1462	4939	1156	652	9161	6704	49921	10114	60036
1992	12127	11032	9051	1521	5097	1196	697	9739	7107	52375	10706	63081
1993	12617	11821	9712	1601	5299	1249	752	10237	7624	55307	11418	66726
1994	12981	12521	10290	1663	5454	1282	794	10676	8085	57764	12035	69799
1995	13219	13116	10777	1707	5547	1298	823	10996	8472	59661	12506	72168
1996	13439	13689	11239	1748	5634	1314	855	11353	8843	61511	12972	74484
1997	13854	14480	11910	1829	5804	1359	909	12080	9397	64574	13704	78278
1998	14141	15163	12521	1897	5937	1388	948	12485	9916	66980	14313	81293
1999	14624	16052	13314	2003	6125	1431	1014	13005	10575	70240	15150	85390
2000	14927	16761	13975	2075	6251	1458	1049	13460	11141	72795	15790	88586

AS PERCENT OF TOTAL FOR EACH YEAR

1985	20.95	15.03	11.92	2.49	9.28	2.39	0.91	15.18	11.52	83.71	16.29	100
1986	21.43	15.95	13.22	2.65	10.13	2.60	1.01	16.83	6.52	83.78	16.22	100
1987	21.23	16.14	13.29	2.56	9.33	2.30	1.02	15.77	9.06	83.53	16.47	100
1988	20.70	16.41	13.66	2.57	8.92	2.18	1.05	15.49	9.79	83.39	16.61	100
1989	20.34	16.67	13.88	2.54	8.61	2.07	1.07	15.29	10.47	83.31	16.69	100
1990	20.04	16.95	13.99	2.47	8.35	1.95	1.07	15.20	11.07	83.27	16.73	100
1991	19.66	17.25	14.18	2.44	8.23	1.93	1.09	15.26	11.17	83.15	16.85	100
1992	19.23	17.49	14.35	2.41	8.08	1.90	1.11	15.44	11.27	83.03	16.97	100
1993	18.91	17.72	14.56	2.40	7.94	1.87	1.13	15.34	11.43	82.89	17.11	100
1994	18.60	17.94	14.74	2.38	7.81	1.84	1.14	15.30	11.58	82.76	17.24	100
1995	18.32	18.17	14.93	2.37	7.69	1.80	1.14	15.24	11.74	82.67	17.33	100
1996	18.04	18.38	15.09	2.35	7.56	1.76	1.15	15.24	11.87	82.58	17.42	100
1997	17.70	18.50	15.22	2.34	7.42	1.74	1.16	15.43	12.01	82.49	17.51	100
1998	17.40	18.65	15.40	2.33	7.30	1.71	1.17	15.36	12.20	82.39	17.61	100
1999	17.13	18.80	15.59	2.35	7.17	1.68	1.19	15.23	12.38	82.26	17.74	100
2000	16.85	18.92	15.78	2.34	7.06	1.65	1.19	15.20	12.58	82.17	17.83	100

INDEX 1986 = 1.00

1985	0.98	0.95	0.91	0.94	0.92	0.93	0.91	0.91	1.78	1.01	1.01	1.01
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1987	1.08	1.10	1.10	1.05	1.00	0.96	1.10	1.02	1.51	1.09	1.11	1.09
1988	1.16	1.23	1.24	1.16	1.05	1.00	1.25	1.10	1.80	1.19	1.22	1.20
1989	1.21	1.33	1.34	1.22	1.08	1.01	1.35	1.16	2.05	1.27	1.31	1.27
1990	1.23	1.40	1.40	1.23	1.09	0.99	1.41	1.19	2.24	1.31	1.36	1.32
1991	1.25	1.48	1.47	1.25	1.11	1.01	1.48	1.24	2.34	1.36	1.42	1.37
1992	1.29	1.57	1.56	1.30	1.14	1.04	1.58	1.32	2.48	1.42	1.50	1.43
1993	1.34	1.69	1.67	1.37	1.19	1.09	1.70	1.38	2.66	1.50	1.60	1.52
1994	1.38	1.79	1.77	1.43	1.22	1.12	1.80	1.44	2.82	1.57	1.69	1.59
1995	1.40	1.87	1.85	1.46	1.25	1.13	1.86	1.49	2.96	1.62	1.75	1.64
1996	1.43	1.95	1.93	1.50	1.26	1.15	1.93	1.53	3.09	1.67	1.82	1.69
1997	1.47	2.06	2.05	1.57	1.30	1.19	2.06	1.63	3.28	1.75	1.92	1.78
1998	1.50	2.16	2.15	1.63	1.33	1.21	2.14	1.69	3.46	1.82	2.01	1.85
1999	1.55	2.29	2.29	1.72	1.38	1.25	2.30	1.76	3.69	1.91	2.12	1.94
2000	1.58	2.39	2.40	1.78	1.40	1.27	2.37	1.82	3.89	1.98	2.21	2.01

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

1 9/2/87 DCI update with fixes

THERMOPLASTIC RESINS SOLD TO THE TOTAL DOMESTIC (TOT - EX) MARKET

	LDPEdc	HDPE	PROPYL	ABSSAN	STYREN	SBLOSB	NYLON	PVC	OTHER	SUBTOT	RESID	TOTAL
1985	8143	5774	4400	951	4024	1025	379	6428	4476	35600	0	35600
1986	8484	6090	4682	1007	4340	1071	403	7027	2623	35731	0	35731
1987	8987	6675	5101	1042	4363	1048	449	7116	3886	38670	0	38670
1988	9416	7316	5600	1114	4572	1096	508	7613	4547	41786	0	41786
1989	9733	7863	5986	1146	4698	1113	552	7973	5140	44204	0	44204
1990	9902	8306	6250	1143	4733	1099	579	8218	5627	45856	0	45856
1991	10053	8768	6537	1149	4834	1124	608	8566	5899	47535	0	47535
1992	10312	9345	6917	1180	4995	1163	652	9129	6272	49964	0	49964
1993	10700	9998	7372	1225	5196	1217	703	9601	6744	52755	0	52755
1994	10969	10565	7745	1251	5351	1249	743	10017	7164	55056	0	55056
1995	11114	11024	8022	1258	5443	1265	770	10316	7511	56726	0	56726
1996	11260	11478	8293	1266	5532	1281	800	10659	7850	58423	0	58423
1997	11569	12114	8722	1305	5701	1326	852	11361	8357	61314	0	61314
1998	11734	12619	9059	1327	5833	1354	888	11738	8822	63386	0	63386
1999	12062	13292	9522	1377	6019	1397	951	12219	9413	66271	0	66271
2000	12219	13789	9857	1395	6143	1423	982	12640	9916	68390	0	68390

AS PERCENT OF TOTAL FOR EACH YEAR

1985	22.87	16.22	12.36	2.67	11.30	2.88	1.06	18.06	12.57	100.00	0.00	100
1986	23.74	17.05	13.11	2.82	12.15	3.00	1.13	19.67	7.34	100.00	0.00	100
1987	23.24	17.26	13.19	2.69	11.28	2.71	1.16	18.40	10.05	100.00	0.00	100
1988	22.53	17.51	13.40	2.67	10.94	2.62	1.22	18.22	10.88	100.00	0.00	100
1989	22.02	17.79	13.54	2.59	10.63	2.52	1.25	18.04	11.63	100.00	0.00	100
1990	21.59	18.11	13.63	2.49	10.32	2.40	1.26	17.92	12.27	100.00	0.00	100
1991	21.15	18.45	13.75	2.42	10.17	2.36	1.28	18.02	12.41	100.00	0.00	100
1992	20.64	18.70	13.84	2.36	10.00	2.33	1.30	18.27	12.55	100.00	0.00	100
1993	20.28	18.95	13.97	2.32	9.85	2.31	1.33	18.20	12.79	100.00	0.00	100
1994	19.92	19.19	14.07	2.27	9.72	2.27	1.35	18.20	13.01	100.00	0.00	100
1995	19.59	19.43	14.14	2.22	9.60	2.23	1.36	18.19	13.24	100.00	0.00	100
1996	19.27	19.65	14.19	2.17	9.47	2.19	1.37	18.25	13.44	100.00	0.00	100
1997	18.87	19.76	14.23	2.13	9.30	2.16	1.39	18.53	13.63	100.00	0.00	100
1998	18.51	19.91	14.29	2.09	9.20	2.14	1.40	18.52	13.92	100.00	0.00	100
1999	18.20	20.06	14.37	2.08	9.08	2.11	1.43	18.44	14.21	100.00	0.00	100
2000	17.87	20.16	14.41	2.04	8.98	2.08	1.44	18.48	14.50	100.00	0.00	100

INDEX 1986 = 1.00

1985	0.96	0.95	0.94	0.94	0.93	0.96	0.94	0.91	1.71	1.00	0.00	1.00
1986	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
1987	1.06	1.10	1.09	1.03	1.01	0.98	1.12	1.01	1.48	1.08	0.00	1.08
1988	1.11	1.20	1.20	1.11	1.05	1.02	1.26	1.08	1.73	1.17	0.00	1.17
1989	1.15	1.29	1.28	1.14	1.08	1.04	1.37	1.13	1.96	1.24	0.00	1.24
1990	1.17	1.36	1.33	1.13	1.09	1.03	1.44	1.17	2.14	1.28	0.00	1.28
1991	1.18	1.44	1.40	1.14	1.11	1.05	1.51	1.22	2.25	1.33	0.00	1.33
1992	1.22	1.53	1.48	1.17	1.15	1.09	1.62	1.30	2.39	1.40	0.00	1.40
1993	1.26	1.64	1.57	1.22	1.20	1.14	1.75	1.37	2.57	1.48	0.00	1.48
1994	1.29	1.73	1.65	1.24	1.23	1.17	1.84	1.43	2.73	1.54	0.00	1.54
1995	1.31	1.81	1.71	1.25	1.25	1.18	1.91	1.47	2.86	1.59	0.00	1.59
1996	1.33	1.88	1.77	1.26	1.27	1.20	1.99	1.52	2.99	1.64	0.00	1.64
1997	1.36	1.99	1.86	1.30	1.31	1.24	2.11	1.62	3.19	1.72	0.00	1.72
1998	1.38	2.07	1.93	1.32	1.34	1.26	2.20	1.67	3.36	1.77	0.00	1.77
1999	1.42	2.18	2.03	1.37	1.39	1.30	2.36	1.74	3.59	1.85	0.00	1.85
2000	1.44	2.26	2.10	1.38	1.42	1.33	2.44	1.80	3.78	1.91	0.00	1.91

LDPEdc forecasts have been adjusted for the down-gaging effects of projected sales of Linear Low - LDPEdc = domestic consump

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