

IN THE MATTER OF
OWENS-ILLINOIS, INC., ET AL.

FINAL ORDER, OPINION, ETC., IN REGARD TO ALLEGED
VIOLATION OF SEC. 7 OF THE CLAYTON ACT AND
SEC. 5 OF THE FEDERAL TRADE COMMISSION ACT

Docket 9212. Complaint, Jan. 11, 1989--Final Order, Feb. 26, 1992

This final order dismisses the complaint against the respondents because the record does not show that the acquisition of Brockway is likely to substantially lessen competition or to create a monopoly in the glass container industry.

Appearances

For the Commission: *Dennis F. Johnson and Ernest Nagata.*

For the respondents: *Richard C. Weisberg, Latham & Watkins, Washington, D.C. Paul C. Warnke, John C. Calender, and Harold D. Murry, Jr., Howrey & Simon, Washington, D.C.*

COMPLAINT

The Federal Trade Commission, having reason to believe that respondents Owens-Illinois, Inc. ("Owens") and its wholly-owned subsidiary, BI Acquisition Corporation ("BIAC"), corporations subject to the jurisdiction of the Commission, have entered into agreements with Brockway, Inc. ("Brockway") that violate Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, that pursuant to these agreements, Owens and BIAC have commenced a cash tender offer to acquire all outstanding common shares of Brockway and intend to merge with Brockway following the cash tender offer, which cash tender offer, acquisition and merger would, if consummated, violate Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, and that a proceeding in respect thereof would be in the public interest, hereby issues its complaint pursuant to Section 11 of the Clayton Act, 15 U.S.C. 21, and Section 5(b) of

the Federal Trade Commission Act, 15 U.S.C. 45(b), stating its charges as follows:

I. THE PARTIES

A. *Owens-Illinois, Inc.*

1. Respondent Owens is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business located at One SeaGate, Toledo, Ohio.

2. Owens is a manufacturer of packaging products, including glass containers, plastic products, specialty packaging products, tumblers and stemware, scientific and laboratory glassware, glass television components, and prescription containers. It is one of the two leading producers of glass containers in the United States. Owens also has investments in health care (nursing homes) and financial services (mortgage banking). For the year ended December 31, 1986, Owens had net sales of approximately \$2.9 billion and total assets of approximately \$3.5 billion.

3. Owens is owned by Kohlberg, Kravis, Roberts & Co. ("KKR"), a private investment firm. KKR also owns or controls various other corporations, including Beatrice Foods Company, the parent corporation of Tropicana Products, Inc. ("Tropicana"). Tropicana also produces and sells glass containers.

B. *BI Acquisition Corporation*

4. Respondent BIAC is a newly formed corporation organized under the laws of the state of New York, with its principal place of business located at One SeaGate, Toledo, Ohio.

5. BIAC was formed by Owens in connection with the cash tender offer for Brockway's outstanding voting securities. BIAC is a wholly-owned subsidiary of Owens, and is the entity through which Owens intends to acquire Brockway's outstanding voting securities.

C. Brockway, Inc.

6. Respondent Brockway is a corporation organized and existing under the laws of the State of New York, with its principal place of business located at 225 Water Street, Jacksonville, Florida.

7. Respondent Brockway is a manufacturer of glass, plastic and metal containers, caps, lids and closures for packaging consumer and industrial products. Brockway is the third largest producer of glass containers in the United States. The company also operates a regional passenger airline in the northeast corridor. For the year ended December 31, 1986, Brockway had net sales of approximately \$1.1 billion and total assets of approximately \$494.3 million.

II. JURISDICTION

8. At all times relevant herein, respondent Owens has been, and is now, engaged in commerce as "commerce" is defined in Section 1 of the Clayton Act, as amended, 15 U.S.C. 12, and is a corporation whose business is in or affecting commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, as amended, 15 U.S.C. 44.

9. At all times relevant herein, respondent BIAC has been, and is now, engaged in commerce as "commerce" is defined in Section 1 of the Clayton Act, as amended, 15 U.S.C. 12, and is a corporation whose business is in or affecting commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, as amended, 15 U.S.C. 44.

10. At all times relevant herein, respondent Brockway has been, and is now, engaged in commerce as "commerce" is defined in Section 1 of the Clayton Act, as amended, 15 U.S.C. 12, and is a corporation whose business is in or affecting commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, 15 U.S.C. 44.

III. THE PROPOSED ACQUISITION

11. Owens, BIAC and Brockway entered into an Agreement and Plan of Merger ("Merger Agreement"), dated September 17, 1987,

pursuant to which Owens, through BIAC, commenced a cash tender offer for all outstanding voting securities of Brockway for \$60 per share. In addition, pursuant to a second agreement dated September 17, 1987 ("Option Agreement") among Owens, BIAC and Brockway, Owens has the right to purchase up to 2,300,000 shares of authorized but unissued shares of Brockway for \$60 per share. Following the cash tender offer, BIAC and Brockway are to merge, and Brockway will thereby become an indirect wholly-owned subsidiary of Owens. The total value of the cash tender offer is approximately \$750 million.

IV. TRADE AND COMMERCE

12. A relevant line of commerce within which to analyze the effects of this acquisition is the manufacture and sale of glass containers.

13. A relevant section of the country within which to analyze the effects of this acquisition is the entire continental United States.

V. MARKET STRUCTURE

14. The proposed acquisition would substantially increase concentration in the United States glass container market and would make that market highly concentrated, whether measured by capacity or by unit or dollar sales.

VI. ENTRY CONDITIONS

15. Barriers to entry into the United States glass container market are substantial. Even if new entry were to occur, it would take a long time, during which time substantial harm to competition could occur.

VII. ACTUAL COMPETITION

16. Owens and Brockway are actual, direct and substantial competitors in the manufacture of glass containers in the United States.

VIII. EFFECTS OF THE ACQUISITION

17. The effects of the proposed acquisition of Brockway by Owens and BIAC may be substantially to lessen competition in the relevant market in violation of Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45, in the following ways, among others:

- (a) It will eliminate substantial direct competition between Owens and Brockway in the relevant market;
- (b) It will substantially increase concentration in the relevant market, thereby increasing the likelihood of successful anti-competitive interdependent conduct, nonrivalrous behavior, and actual or tacit collusion among firms in the relevant market; and
- (c) It will eliminate Brockway as a substantial independent competitive force in the relevant market.

All of the above increase the likelihood that firms in the relevant market will increase prices and decrease the likelihood that they will decrease prices, both in the near future and in the long term.

IX. VIOLATIONS CHARGED

18. The proposed acquisition of Brockway by BIAC and Owens would, if consummated, violate Section 7 of the Clayton Act, as amended, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45.

19. The Merger Agreement and Option Agreement described in paragraph 11 above violate Section 5 of the Federal Trade Commission Act, as amended, 15 U.S.C. 45.

Chairman Oliver voting in the negative.

INITIAL DECISION BY

JAMES P. TIMONY, ADMINISTRATIVE LAW JUDGE
SEPTEMBER 11, 1989

I. INTRODUCTION

The Commission's complaint, issued on January 11, 1988, charges that the acquisition of Brockway, Inc. ("Brockway") by Owens-Illinois, Inc. ("O-I" or "Owens") and Owens' wholly-owned subsidiary, BI Acquisition Corporation ("BIAC"), is unlawful under Section 7 of the Clayton Act, 15 U.S.C. 18, and Section 5 of the Federal Trade Commission Act, 15 U.S.C. 45.¹ The complaint alleges that the relevant line of commerce is the manufacture and sale of glass containers; that the relevant section of the country is the continental United States; that prior to the acquisition Owens and Brockway were competitors in the manufacture of glass containers in the United States; that the acquisition would substantially increase concentration in the United States glass container market; and that barriers to entry are substantial. The complaint further charges that the effects of the acquisition may be to eliminate an independent Brockway and direct competition between Owens and Brockway; and increase the likelihood of a price increase and anticompetitive conduct among firms in the relevant market.

¹ References to the record are made using the following abbreviations:

F	Findings of Fact
CX	Commission Exhibit
RX	Respondents' Exhibit
Stip.	Stipulation
Tr.	Transcript

Citations to the transcript of testimony are by witness name and the transcript page. Citation to exhibits are by exhibit number and page.

A. The Parties and Commerce

Owens - Illinois, Inc.

1. Owens is a Delaware corporation with its principal place of business at One Seagate, Toledo, Ohio.

2. Owens is a manufacturer of glass containers, plastic containers, tumblers and stemware, laboratory glassware, and glass television components. Owens is one of the two leading producers of glass containers in the United States. For 1987, Owens had a net sales of \$3.1 billion and assets of \$4.5 billion. (CX 109U, V.)

3. On March 24, 1987, Kohlberg, Kravis, Roberts & Co. ("KKR") bought control of Owens. (CX 109D.) A February 1987 memorandum concerning the acquisition financing for the buy-out explains that Owens was a "good leveraged buy-out" in part because of the company's "Dominant Market Position" in glass containers, with "approximately 26% share" of the domestic glass container market. (CX 101 Q.) The memorandum describes Owens as follows:

Domestically, GCD [Owens' Glass Container Division] enjoys a dominant market share in both beer and soft drink glass container industries. Excluding Gallo, which manufactures its own containers, the Glass Container Division is also dominant in the wine and wine cooler glass container business. The Division holds the number two position behind Diamond-Bathurst in liquor containers and the number two position behind Brockway in food containers. In the markets for drug and chemical glass containers, which are declining markets, GCD's market position is less dominant. Overall, GCD has approximately a 26% market share in the U.S. (CX 101Z12.)

4. Over 90% of the outstanding common stock of Owens is beneficially owned by KKR Associates, a New York limited partnership, which is an affiliate of KKR. (CX 16C.) Owens is controlled by KKR Associates. (CX 16N.) KKR also owns or controls other corporations, including Safeway Stores, Inc. (Haworth, Tr. 3915-16) and Beatrice Foods Company. (Stollsteimer, Tr. 4331.)

5. Owens is engaged in commerce and is a corporation. (Complaint ¶¶8; Owens Answer ¶¶9.)

BI Acquisition Corporation

6. BIAC is a New York corporation organized with its principal place of business at One Seagate, Toledo, Ohio. BIAC is a wholly-owned subsidiary of Owens that was set up for the purpose of acquiring Brockway's voting securities. (Complaint ¶5; Answer ¶6; CX 16A, M-O.)

7. BIAC is engaged in commerce. BIAC solicited Brockway's shares in commerce in connection with the cash tender offer for Brockway. (CX 16.)

Brockway, Inc.

8. Brockway was a New York corporation with its principle place of business at 225 Water Street, Jacksonville, Florida. Brockway manufactured glass, plastic and metal containers, caps, lids and closures for packaging consumer and industrial products. Brockway was the third largest producer of glass containers in the United States. For 1986, Brockway had net sales of \$1.1 billion and assets of \$494.3 million.

9. Brockway is engaged in commerce.

B. *The Acquisition*

10. Owens, BIAC and Brockway entered an agreement on September 17, 1987, whereby Owens, through BIAC, made a cash tender offer for all outstanding voting securities of Brockway for \$60 per share. (CX 16; CX 17; CX 130.) The value of the cash tender offer was approximately \$750 million for the shares, plus an additional \$110 million for expenses and debt retirement. (CX 16J.) Owens' Chairman, Robert Lanigan, summarized the rationale for the acquisition as follows:

Our determination to maintain and improve our position in glass and plastic packaging is exactly what the Brockway acquisition is about. * * * The objective is to increase our share of the total domestic glass container market by adding to our capacity without adding new capacity to the industry. * * * The best estimates are that Brockway has a 16 percent share of the domestic market. The Owens-Illinois share is about 24 percent. That is only slightly ahead of the share claimed by Anchor Glass, following

its recent merger of Diamond Bathurst. Anchor was at about 14 percent and Diamond at about 10 percent. Of the remaining domestic producers the other significant players are Ball-Incon with some 11 percent, Foster-Forbes with about 6 percent, and Kerr, which has some 4 percent. If we are successful with the Brockway merger, on the glass side we will have about 40 percent of the domestic market. And we will be nearly twice the size . . . and infinitely more productive and efficient . . . than the next largest competitor. One way to look at the Brockway acquisition is that if we are successful the cost will be in the range of some \$240 per ton of capacity added. We are sure that this particular capacity represents the best existing domestic glass container assets, aside from our own. The price is well below what it would cost to add new greenfield capacity, which we would not do in any case. (CX 43J-L.)

11. Owens wanted greater control of the glass container market and higher prices for glass containers. In July 1986, Owens' director of planning reported to Owens' president that the acquisition of Brockway would allow Owens to "Become 40% of glass market-place" (CX 1221 at 4); "A combination to 40% share could establish price leadership position and effect price assumptions" (CX 118J); and the "Alternative of expanding existing O-I assets . . . may lead to overall price erosion due to over capacity." (CX 118K.)

The report concludes: "Thus, we are in a position to manage the industry to maximize cash for O-I by acquiring these assets." (CX 118K.)

C. Procedural History

12. On November 18, 1987, the Commission voted to seek a preliminary injunction in the United States District Court for the District of Columbia pending the administrative proceeding. A complaint was filed on January 6, 1988, and Judge Joyce Hens Green entered a temporary restraining order, and on February 18, 1988 denied the preliminary injunction. *FTC v. Owens-Illinois, Inc.*, 681 F. Supp. 27, 30 (D.D.C. 1988), *vacated*, 850 F.2d 694 (D.C. Cir. 1988). The district court concluded that end-uses for glass had no acceptable alternatives but that these end-uses are not large enough to result in a "substantial" lessening of competition under Section 7:

The eleven end-use segments presented by the FTC constitute . . . only about 25.8% of the total glass container tonnage. Thus, in the vast majority . . . of end-uses for glass containers, other packaging materials, including plastic, metal, and paper, compete directly and vigorously with glass.

* * * *

The inquiry could end here, since it is possible to conclude for these reasons that, even aggregated, the end-use segments at issue, assuming *arguendo* they are indeed as inelastic as the FTC suggests, do not constitute a sufficient part of the glass market to allow a finding of substantial anticompetitive effect under Section 7. (*Id.*, 681 F. Supp. at 36-37.)

13. The United States Court of Appeals for the District of Columbia Circuit on February 26, 1988, denied the Commission's request for an injunction pending appeal. On April 8, 1988, the court vacated the District Court's Opinion and Order on grounds of mootness. *FTC v. Owens-Illinois, Inc.*, 850 F.2d 694 (D.C. Cir. 1988). The acquisition was completed on April 12, 1988. (CX 109D.)

14. The administrative trial began on November 14, 1988 and concluded on March 30, 1989, with 41 days of hearings. Complaint counsel's case-in-chief began on November 14, 1988 and concluded on December 22, 1988. Respondents' defense began on January 24, 1989 and concluded on March 30, 1989. The record was closed on June 12, 1989, after transcript corrections and decisions on motions for *in camera* treatment from respondents and numerous third parties.

II. THE INDUSTRY

A. Glass Containers

15. Glass containers are used for packaging food, soft drinks, beer, liquor, wine, wine coolers, juices, chemicals, and other products. (CX 131D.) During 1987, domestic sales of glass containers were \$4.9 billion (CX 1451F), with shipments of more than 40 billion (281.6 million gross) containers. (RX 885D.)

16. The following table shows unit distribution of glass containers by end-use during 1987 (RX 885D):

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	<u>Millions of Gross Units</u>	<u>Percent of Total</u>
Food	89.9	31.9
Beer	85.4	30.3
Non-Alcoholic Beverages	62.4	22.2
Wine	16.5	5.9
Distilled Spirits	11.8	4.2
Medicinal & Health	8.6	3.1
Toiletries & Cosmetics	5.6	2.0
Chemicals	<u>1.4</u>	0.5
TOTAL	281.6	

17. Industry shipments of glass containers fell during the early 1980's but have stabilized. (CX 131D; RX 885D.) The drop in the early 1980's resulted from the loss of family-size (two-liter) soft drink containers to plastic, and a shift in the beer industry to metal cans. (CX 50Z10; CX 49R; CX 1013N; CX 1026I.) Analysts predict a stable industry with a growth of about 1% a year. (Zoon, Tr. 58; CX 52C, I; Cavanagh, CX 90V and Tr. 5239; RX 885D, E; CX 935E.)

18. The loss of family-size soft drink containers to plastic in the early 1980's occurred because of the weight and breakability of glass. (Harralson, Tr. 1568; Honickman, Tr. 3859-60; CX 49R; CX 1013N.) The loss of glass sales in the beer market occurred because of a change in the relative prices between glass and aluminum cans, as well as a declining market share for the Miller High-Life brand, which was a large user of glass. (CX 1013N; CX 1026I; CX 50Z10.)

19. Owens regards the shift from glass to plastic for two-liter bottles as an "aberration" (CX 1013N), and does not regard the drop in glass container sales in the early 1980's as reflecting a broad shift away from glass to plastic. (CX 1013N; See CX 49R; CX 50Z10.)

20. Before the Owens/Brockway acquisition, the domestic glass container market had six producers with four or more plants, and twelve smaller firms. (CX 1451B-E.) Of these twelve, only Latchford and Wheaton operate more than one plant, and five are single-plant in-house producers for glass container users (Central New York - Miller [CX 79Z36]; Gallo - Gallo [CX 79Z62]; Columbine - Coors [CX 79Z37]; Industrial - Seagram/Tropicana [CX 79Z65]; Hillsboro - Hiram-Walker [CX 79Z64]). (CX 1451B-E; CX 551T-U.) The following chart shows, for each producer, the number

of plants in operation in 1987, 1987 dollar sales and market share based on 1987 dollar sales volume (CX 1451B-F):

<u>Company</u>	<u>Number of Plants</u>	<u>1987 Sales (\$ Millions)</u>	<u>Share</u>
Owens-Illinois	16	\$1,153	23.6%
Anchor/Diamond-Bathurst	22	1,135	23.2
Brockway	11	687	14.1
Ball-Incon	12	525	10.7
Triangle (Foster-Forbes)	8	387	7.9
Kerr	4	146	3.0
Miller (Central New York)	1	102	2.1
Latchford	2	101	2.1
Wheaton	2	88	1.8
Gallo	1	86	1.8
Coors	1	72	1.5
Industrial (Seagram/Tropicana)	1	70	1.4
Liberty	1	60	1.2
Glenshaw	1	45	.9
Anchor-Hocking (Carr-Lowrey)	1	30	.6
Hillsboro	1	26	.5
Leone	1	15	.3
Arkansas	1	14	.3

21. Since 1980, there has been a trend toward concentration in this market due to mergers and acquisitions (CX 26Z301; CX 32, CX 123K, CX 921B, CX 936A, Z30, CX 1007Z7, CX 1011):

1980	Ball acquired Metro-Pak
1981	Diamond-Bathurst acquired National Bottle
1983	Anchor acquired Midland Glass
1983	Chattanooga Glass (Container General) acquired Glass Container Corp.
1983	Foster-Forbes (later acquired by Triangle Industries) acquired four plants from Kerr
1985	Diamond-Bathurst acquired Chattanooga (Container General)
1985	Diamond-Bathurst acquired Thatcher
1987	Ball and Incon (owner of the former Madera, Laurens, Northwestern and Pierce glass companies) merged glass operations to form Ball-Incon
1987	Anchor acquired Diamond-Bathurst
1988	Owens acquired Brockway

22. Since 1980, 30 plants, 100 glass furnaces, and 350 glass-making machines have been shut down. (CX 27Z73-Z75; CX 79G; CX 816T.)

23. A June 26, 1987, Owens memorandum to members of the board of directors at KKR observes that all of this "consolidation" among container producers "leads to a more stable pricing environment." (CX 109Z38; CX 123D; CX 843E.)

B. Metal Containers

24. Domestic shipments of metal cans during 1987 totaled 109.3 billion units, valued at \$10.9 billion. (RX 885A, B.) Metal cans are used for beverages with 1987 end-use as follows (RX 885A):

	Shipments (billions of units)
Soft Drinks	40.3
Beer	36.5
Food	28.4
General Packaging	4.1

25. The domestic producers of metal cans include Triangle (American-National Can), Continental, Crown Cork & Seal, Reynolds, Ball, and Anheuser-Busch. (Zoon, Tr. 92.) The Department of Commerce forecasts that the metal can industry is expected to grow at an average annual rate of 3%, measured in constant dollars, during the period 1989-93. (RX 885C.)

C. Plastic Containers

26. Shipments of plastic bottles during 1987 totaled approximately 35.5 billion units. (RX 885E.) Distribution by end-use during 1987 was as follows (RX 885E):

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Shipments
(millions of units)

Soft Drinks	7,970
Household Chemicals	5,302
Milk	5,235
Medicinal and Health	4,113
Beverages (except soft drinks)	3,260
Toiletries/Cosmetics	2,889
Automotive and Marine	2,700
Food (other than milk)	2,233
Industrial Chemicals	400
Other	1,425

27. Plastic containers are produced from a variety of resins, including polyethylene terephthalate ("PET"), high density polyethylene ("HDPE"), low density polyethylene ("LDPE"), polyvinyl chloride ("PVC"), polypropylene ("PP"), and polystyrene ("PS"). (Carter, Tr. 2515-18; RX 885E.)

28. PET is a clear resin used for soft drinks, peanut butter, mustard, barbecue sauce, and cough medicine. (Carter, Tr. 2516.) PET does not have a good oxygen barrier, which affects the shelf-life and the taste of some products. (Malone, Tr. 5927; F 109.)

29. PVC can be produced as a clear or pigmented (opaque) resin that is used for edible oils, automotive waxes, engine additives, and charcoal lighter fluid. (Carter, Tr. 2516.)

30. HDPE is a translucent resin that can be used to make translucent or opaque containers. End-uses for HDPE include industrial and household chemicals, milk and other dairy products, large institutional food products, and automotive products. (Carter, Tr. 2517.)

31. LDPE is a resin used to produce translucent or opaque containers. LDPE is used primarily for mustard containers. (Carter, Tr. 2517.)

32. Polypropylene resin is not clear, but has "contact clarity" so that the color of the contents can be discerned through the container, and is used for table syrups and disposal units for medical waste. (Carter, Tr. 2518.) Polypropylene has high oxygen permeability relative to glass, which should not be used for a product that requires long shelf-life. (Erwin, Tr. 5134.)

33. In recent years, plastic container producers have combined resins into opaque or translucent "multi-layer" squeezable containers, such as those used for Welch's squeezable jelly and Hunt's Ketchup. (Rembert, Tr. 169-70; Stollsteimer, Tr. 4285-88, 4352-53.) These containers consist of several layers of different resins. (Trumbull, CX 25 at 26-27.) More costly than glass, these containers have been successful in ketchup, but not for mayonnaise, jelly, or baby juice. (Zoon, Tr. 52-53, 75; F 131, 155, 197.)

34. Domestic producers of plastic containers include Sewell, Johnson Controls, Continental, Amoco, Owens-Illinois, Triangle (American-National Can), and Ball. (Zoon, Tr. 34; Carter, Tr. 2515.) In multi-layer plastic containers, Triangle (American-National Can) has a 50% share, Continental has a 15% share, and Owens a 35% share. (CX 403B.)

35. Consumption of plastic bottle materials during 1987 as follows (RX 885E):

	<u>Millions of Pounds</u>
High density polyethylene (HDPE)	2,587
Polyethylene terephthalate (PET)	881
Polyvinyl Chloride (PVC)	214
Polypropylene (PP)	119
Low density polyethylene (LDPE)	47
Polystyrene and other	53

36. The growth rate for plastic containers slowed in 1988 due to three factors: (1) difficulty in converting the additional glass and metal users to plastic, (2) tight resin supplies and increased prices, and (3) uncertainty about recycling legislation. (RX 885E.)

III. RELEVANT PRODUCT MARKET

A. Glass Containers

37. There are two types of glass containers: wide-mouth and narrow-neck. (CX 99A, B, C.) Wide-mouth jars are used for non-pourable products such as mayonnaise or pickles. Narrow-necked containers are used for beer, soft drinks, and ketchup. (Zoon, Tr. 42; Blecharz, Tr. 4979-80.)

38. Glass has characteristics required for:

- Products that require a clear, retortable container -- such as baby food or spaghetti sauce with meat. (F 105 - 145.)
- Products that require a clear, wide-mouth, hot-fillable container -- such as baby juice, pickles, spaghetti sauce without meat, or jams and jellies. (F 105 - 164.)
- Products that require a clear, wide-mouth, impermeable container -- such as mayonnaise. (F 185 - 197.)
- Products that require a clear, hot-fillable, impermeable container -- such as shelf-stable juice. (F 165 - 184.)
- Products that require a clear, impermeable container that provides a quality image -- such as wine, wine coolers or distilled spirits. (F 198 - 225.)
- Products that require a clear, impermeable container -- such as certain single-serve soft drinks. (F 227 - 229.)

39. Glass containers have characteristics not found in other types of containers: clear, impermeable, retortable, resealable, inert, rigid, quality image, microwaveable and recyclable. (F 40-52, 96-104.)

1. Clear

40. Glass is clear, allowing the consumer to see the contents of the container. (Jones, Tr. 512-14; Rottman, Tr. 919; Willers, Tr. 1695, 1705; CX 553A.)

41. Metal cans and many plastics lack clarity. (Zoon, Tr. 38; Jones, Tr. 581; Jameson, Tr. 795.)

2. Impermeable

42. Glass is impermeable so it does not allow air or moisture to enter the container or gases (such as carbonation) to escape, which protects the contents from spoiling and provides extended shelf-life. (Jones, Tr. 519; Rottman, Tr. 919; CX 553A.)

43. One disadvantage of plastic for use in packaging food and beverages is inadequate shelf-life. (Zoon, Tr. 38; Cavanagh, Tr. 5339; Coakley, CX 23X-Y.)

3. Retortable

44. Retort is sterilization used for meats and vegetables, cooking them in the jar at 235-255 degrees and at high pressure. (Jones, Tr. 514; Rottman, Tr. 911-12; Gigliotti, Tr. 5677.) Baby juice, and jams and jellies are "hot-filled" at temperatures from 190-215 degrees. (Rottman, Tr. 912.) Glass containers are retortable and are used for products that are heated in the container, pasteurized, or hot-filled. (CX 553A; Buttermore, CX 24Z5, Z19.) There are no clear plastic containers that can be retorted. (F 68.) There are no commercially available clear wide-mouth plastic containers that can be hot-filled. (F 69.)

4. Resealable

45. Glass containers can be closed, permitting consumers to save the unused product for future use. (Jones, Tr. 519; Jameson, Tr. 795; CX 553A.)

46. Metal cans cannot be closed. (Jones, Tr. 581; Jardis, Tr. 1321; Coakley, CX 23X.)

5. Inert

47. Glass is inert, and will not affect the taste of the contents. (Faulkner, Tr. 1305; Jardis, Tr. 1321-22; CX 553A.) Plastic containers and metal cans are not inert. (Jones, Tr. 520-21; Jardis Tr. 1321-22; Willers, Tr. 1697; Erwin, Tr. 5142.)

6. Rigid

48. Glass containers are rigid, which permits their use on high-speed filling lines, as well as leak-proof closures, and provides strength so that cases can be stacked in warehouses. (Jones, Tr. 517, 527-29, 545; Rottman, Tr. 912-13, 920; CX 553A.)

49. Plastic containers lack rigidity, causing "paneling," (plastic buckling inward toward a vacuum.) (Mitchell, Tr. 680; Erwin, Tr. 5119.) Plastic's lack of rigidity requires slow filling line speeds relative to glass (Jones, Tr. 529; Rottman, Tr. 913; Faulkner, Tr.

1269) and the inability to use some closures without leakage. (Jones, Tr. 527-28; Wilson, Tr. 2213.) Plastic cannot be stacked as high as glass. (Jones, Tr. 517, 529; Rottman, Tr. 930; Faulkner, Tr. 1269.)

7. Quality image

50. Glass is perceived as projecting a quality image. (Willers, Tr. 1696; Smith, Tr. 1931, 1936; CX 553A, B.)

8. Microwaveable

51. Glass can be used in microwave ovens. (Jones, Tr. 519-20; CX 553A; CX 1022R.)

9. Cost

52. Glass is the lowest cost container for many uses. Plastic mayonnaise containers would be 25-30% more than glass. Plastic for baby juice would be 2-3 times the cost of glass. (Faulkner, Tr. 265-67; Mitchell, Tr. 660, 669.) The cost of plastic containers relative to glass results from the cost of the container itself, and costs for closures, and cartons. (CX 391I; CX 393B; CX 1007F.)

B. *Substitution*

53. Demand for glass containers is influenced by: the size of containers (F 54-57); the portion of retail price represented by the glass container (F 58); the testing involved in packaging decisions (F 59-65); and functional, marketing and cost limitations on packaging. (F 66-80.)

54. Plastic costs more than glass in smaller size containers than it does in larger sizes (F 55); the lightness and safety of plastic in large sizes is not important in smaller sizes (F 56); and permeation problems with plastics are magnified in small sizes. (F 57.)

55. The cost of plastic compared to glass is higher as container sizes become smaller. (Zoon, Tr. 39-40; Jones, Tr. 544; Rottman, Tr. 924-25.)

56. In large containers, such as two-liter soft drinks, the weight and breakability of glass is more disadvantageous than in smaller sizes. (Harralson, Tr. 1568; Bourque, Tr. 2078; Honickman, Tr. 3859-60; Lemieux, CX 26Z168-Z169.)

57. The surface-to-volume ratio is a measurement of the area of the container in contact with the contents relative to the total volume of the container. (Ayres, Tr. 1857-58.) The surface-to-volume ratio increases as the container size gets smaller. (Zabinko, Tr. 5447.) As the surface-to-volume ratio increases, the shelf-life of plastic containers decreases because of permeation. (Bourque, Tr. 2076.)

58. The price of a glass container is about 10-20% of the wholesale price of the packaged product. (Jameson, Tr. 895; Rottman, Tr. 935.) The price of a glass container is less than 10% of the price to the consumer. (CX 21 at 4.)

59. Users of containers do not switch back and forth over the short term between types of packages based on costs. (F 60.) The package is a part of their brand identity (F 32), and changes in packaging are made at the highest corporate levels. (F 62-65.)

60. Food and beverage container customers do not switch back and forth between glass and plastic containers based on relative prices. (Carter, Tr. 2537; Lankester, Tr. 4038; Blecharz, Tr. 4961.) Switching requires changing production and distribution systems, and large costs. (Erwin, Tr. 5147, 5157; F 62.)

61. Packaging is important to brand identity. (Willers, Tr. 1716-17, 1719; Lankester, Tr. 4027, 4029-30; Stollsteimer, Tr. 4333-34.)

62. Switching from glass to plastic is a long-term decision. The customer must make line modifications, equipment changes and a major marketing commitment before switching. (Carter, Tr. 2537-38; Blecharz, Tr. 4911; Erwin, Tr. 5052.)

63. Because packaging is important, decisions about changes are made only at the highest corporate levels. (Smith, Tr. 1923-24, 1926; Erwin, Tr. 5116-18.)

64. Firms conduct extensive testing of shelf-life, consumer preference, filling lines, and distribution before a decision on a container change. (Mitchell, Tr. 675-76; Smith, Tr. 1925-26; Erwin, Tr. 5142-43.)

65. Packaging tests require a long period of time. (Bourque, Tr. 2067-68.) Seagram took five years to evaluate 1.75 liter distilled spirits in plastic before test-marketing. (Smith, Tr. 1925-26.) CPC evaluated plastic for packaging its peanut butter for about three or four years, and for two more years to convert. (Mitchell, Tr. 674.)

66. The shelf-life and processing requirements of the products in the food and beverage industry are diverse. (Zoon, Tr. 39; Trumbull, Tr. 4196; Gigliotti, Tr. 5737.) The extent to which other types of containers compete with glass varies by end-use. (CX 540A.) That plastic might be an acceptable package for peanut butter does not indicate whether it would be acceptable for baby food. (Blecharz, Tr. 4913-14; Erwin, Tr. 5150.)²

67. The attributes that a food packer requires from a container vary with the process for making and filling. (Gigliotti, Tr. 5742.) Some food and beverages are retorted or hot-filled; others are warm-filled or cold-filled. (Rottman, Tr. 911-12; Willers, Tr. 1704; Stollsteimer, Tr. 4339.)

68. No clear plastic containers could be used for retorted products such as baby food or retorted spaghetti sauces. (Carter, Tr. 2531-32, 2587-88; Gigliotti, Tr. 5715, 5728, 5736, 5689-90; Malone, Tr. 5931.)

69. No clear wide-mouth plastic containers could be used for hot-filled products such as baby juice, spaghetti sauce, jams and jellies, or hot-packed pickles. (Zoon, Tr. 55-56; Carter, Tr. 2531-32; Gigliotti, Tr. 5689-91.)

70. Plastic does not provide the barrier for shelf-life in some products. (Erwin, Tr. 5137-38; Zabinko, Tr. 5391, 5423, 5432-33, 5447-48.)

71. Wide-mouth plastic containers with high barrier capabilities and heat resistance are a long way off. (CX 45F.)

72. Plastic containers have problems of clarity for baby food (F 118) and spaghetti sauce with meat (F 140); for wide-mouth products

² That a product may be packaged in a type of container in a foreign country may not tell much about whether that package would be accepted in the United States. (Erwin, Tr. 5145-47.) Kraft packages mayonnaise in squeezable tubes in Italy, but mayonnaise is used in small portions to decorate hors d'oeuvres in that country. (Erwin, Tr. 5146.)

where clarity, heat resistance and barrier properties are needed (such as baby juice (F 109), jams and jellies (F 151), and pickles (F 163)); for hot-pack products where clarity and high barrier is needed, such as shelf-stable juice (F 170); and for mayonnaise, wine, wine coolers, and distilled spirits. (F 193, 201, 212, 219.)

73. Glass containers will not be replaced by plastic in beer, retorted products and quality wine (Carter, Tr. 2587); (pickles, spaghetti sauces, baby food) (Gump, Tr. 4238); (wide-mouth hot-pack and retortable containers, including sauces, jams and jellies, and baby food) (Trumbull, CX 25Z14); (baby food, pickles, jams and jellies, and wine) (Lemieux, CX 26X); ("processed food packages or in any shelf-stable food pack that is highly sensitive to oxygen spoilage"). (Cavanagh, Tr. 5239-40.)

74. Multi-layer plastics are not clear and have pricing, technology and consumer acceptance problems. (F 152-156 (jams and jellies); F 197 (mayonnaise); F 161 (relish); F 109, 125-133 (baby juice)).

75. Brockway's 1987-89 Three-Year Plan predicts that plastic will be limited for food packaging (CX 903Z):

Growing concern on the part of food processors for product compatibility, safety and even recycling issues will dampen the penetration of plastics into our markets. In addition, very few plastics packages are completely cost effective, because of slower line speeds or higher spoilage rates.

76. Ketchup changed to plastic containers. (CX 1022I.) Squeezability of a plastic container is an advantage for ketchup because it is difficult to pour out of a glass container. (Stollsteimer, Tr. 4337, 4352; Blecharz, Tr. 4916-19.)

77. Peanut butter changed to plastic containers because of lighter weight and shatter-resistance, in a product consumed by children.³ (Mitchell, Tr. 673-74; CX 45-O; Lankester, Tr. 4035; Coakley, CX 23Z132.) Peanut butter can be packaged in PET because it is not hot-filled and does not have the shelf-life problems of other food products since it is not sensitive to oxygen or moisture. (Carter, Tr.

³ Kraft converted its ice cream toppings to squeezable plastic because it is a "kid oriented" product and plastic provides break-resistance and ease of handling. (Erwin, Tr. 5001.)

2532, 2539.) Like ketchup, the peanut butter conversion occurred in spite of higher costs for plastic. (CX 244B (30-35% premium for plastic over glass); Mitchell, Tr. 676 (20-25% premium for plastic).)

78. Price is one of several factors in determining the type of container that a food processor uses, and is less important than marketing considerations. (Smith, Tr. 2024; Stollsteimer, Tr. 4336-38; Gigliotti, Tr. 5668-69.)

79. Consumer preference is a factor in determining which package is appropriate. (CX 1032J.)

80. Increases in the cost of glass containers do not cause switching to other types of containers. (Blecharz, Tr. 4900-01 and CX 2104Z11.) Despite increases of 63.7% on 15-ounce Worcestershire sauce, 13.93% on 18-ounce barbecue sauce, and 11.98% on 10-ounce Worcestershire sauce, Heinz stayed in glass. (Blecharz, Tr. 4963.)

81. Glass producers do not bid against other types of containers. (Smith, Tr. 1945-47; Carter, Tr. 2538-39, 2532-33; Blecharz, Tr. 4903-04.) When Seagram asks for bids on containers, it does not ask for glass and plastic bids at the same time for the same items in order to get a lower price. (Smith, Tr. 1946.)

82. In most uses, producers of one type of container do not generally take into account the prices of other types of containers when making their bids. (Carter, Tr. 2538.) Where the containers may be substituted, however, as in the single serve soft drink market, the price of competing materials may be a factor. (F 237; Honickman, Tr. 3832-33; Leone, Tr. 2700.)

83. Metal can and glass prices do not move together. (CX 810.) Plastic prices are more volatile than glass prices, so that glass and plastic prices at times move in different directions. (Erwin Tr. 5159; Whiting, CX 1221 at 102.)

84. Plastic bottles, glass containers, and metal cans have different cost. Glass is produced from sand, soda ash and limestone. (Cavanagh, Tr. 5193.) Metal cans are made from aluminum or steel. (Zoon, Tr. 46-47.) Plastic containers are produced from plastic resins which are derived from petroleum-based ethylene and ethylene glycol. (CX 414A.) Half of the costs of a plastic container is raw materials. (Zabinko, Tr. 5464.) The raw material cost of glass is

about 11-13%. (CX 23G.) About 11% of glass costs relates to the price of oil, while 42% of PET costs relates to oil. (CX 1032H.)

85. The cost of raw materials is an advantage glass has had over aluminum, steel and plastics. (CX 1034Z5.)

86. The prices of plastic resins have gone up about 25-30% since late 1987. (Zoon, Tr. 74; Carter, Tr. 2520-21.)

87. Resin price increases are due to increases in the prices of ethylene and ethylene glycol, the raw materials that are used for producing plastic resins. (Carter, Tr. 2522; Zabinko, Tr. 5454; Trumbull, CX 1226 at 18, 21.) Due to a world-wide shortage of ethylene in early 1988 (CX 411), the market price of ethylene and ethylene glycol increased, resulting in higher resin prices. (Carter, Tr. 2522.)

88. The resin price increases since late 1987 have been passed on to food and beverage producers in higher plastic container prices. (Carter, Tr. 2522-23; Erwin, Tr. 5159; CX 938Z75.)

89. Although PET resin production capacity is expected to increase during 1989, non-container demand for PET also is increasing. Thus, the growth in PET resin capacity may not result in lower prices for PET containers. (Carter, Tr. 2526.)

90. Plastic and metal containers are sold FOB plant of manufacture; glass containers are sold on a delivered basis. (Blecharz, Tr. 4954; Coakley, CX 23Z71; Trumbull, CX 25Z64.)

91. Although plastic containers are lighter in weight than glass containers, there is no freight savings. (Cavanagh, Tr. 5256.) Freight rates are determined on truckload basis, not by weight. (CX 2119B.)

92. The plastic container division at Owens employs a separate sales force, research and development department, and profit center from the glass container division. (Bachey, Tr. 3548-49.) The marketing of plastic containers is separate from glass containers. (Bachey, Tr. 3551-52.)

93. Purchasers maintain separate buyers for different types of containers. Heinz has one buyer for glass, one for metal, and one for plastic. (Blecharz, Tr. 4885-86.)

94. Owens computes its market shares based on a glass market, without including other rigid packaging. (CX 33; CX 34A-C; CX 118D.) Owens estimated the 1985 market shares of the companies in "Glass Containers" by end-use segments as follows (CX 26Z239):

	Initial Decision		115 F.T.C.
	<u>Brockway</u>	<u>O - I</u>	<u>Total</u>
Soft Drink	19.0%	32.8%	51.8%
Beer	15.0%	25.0%	40.0%
Food	18.5%	16.1%	34.6%
Other	<u>6.8%</u>	<u>19.2%</u>	<u>26.0%</u>
	15.6%	23.1%	38.7%

95. There is a trade association for glass containers (CX 1121A-H), and a separate trade association for metal cans (RX 918A).

96. Glass is recyclable into new food and beverage containers and has a recycling value in excess of handling costs. (CX 380C; CX 2448J.) Brockway has a waste glass redemption program recycling glass recovered from its manufacturing process and from public sources. (CX 20G.) Plastic containers have a recycling disadvantage inhibiting their penetration of food and beverage markets. (CX 123D; CX 397A-I; Whiting, CX 1221 at 179-180.) PET has little recycling value and is not being recycled.⁴ (Gigliotti, Tr. 5733-34; CX 380C; CX 91I.)

97. Glass and metal can be recycled into new food and beverage containers. Plastic cannot be re-used to make new food and beverage containers because any contaminants absorbed into the side wall of the plastic cannot be cleaned out. (Carter, Tr. 2528; Honickman, Tr. 3844; Trumbull, CX 25Z42-43.)

98. Most PET containers are used for food or beverage applications. (Trumbull, Tr. 4197; Malone, Tr. 5928.)

99. The recycling problems with plastic increase when more than one type of material is contained in the bottle (such as soft drink bottles with HDPE base cups) because the resins must be separated as part of the recycling process, which is complex and costly. (Trumbull, Tr. 4157.) Multi-layer plastics are not currently recyclable. (CX 416D.)

100. Some states restrict the use of plastic containers. The state of Washington does not allow new distilled spirits brands in plastic, and in the future no PET will be allowed. (CX 337.) California

⁴ Other plastics also have environmental problems. PVC containers may leach vinyl chloride monomer, a known carcinogen, from the container into the contents of the bottle. (Trumbull, Tr. 4107.) Incinerated PVC produces pollutants. (Lankester, Tr. 4051.)

requires producers and distributors of carbonated beverages to pay a deposit per bottle, which increases if certain recycling rates not achieved. (Langer, Tr. 1454.) Aluminum cans and glass containers are close to achieving the rates, but plastic containers are "nowhere close to being recycled" at the required levels. (Langer, Tr. 1455.) Certain forms of plastic containers have been banned in some areas. Kentucky prohibited the sale of PET 12 oz. package because of recycling concerns, and sales were discontinued nationwide. (CX 71A; CX 101Z51; CX 360C.)

101. In April 1988, "A-1 Steak Sauce conversion to PET was canceled just prior to market test due to recycling issues." (CX 406B.) The Coca-Cola bottler in Oregon switched back to glass from PET in 16 oz. and limited the use of plastic to two-liter containers "due to opposition to plastics by environmentalists and others." (CX 399Q.)

102. Coca-Cola test-marketed Petainer, a 12-ounce PET can with metal ends during 1986/87, but dropped the test after resistance over the container's recyclability. The Petainer was very difficult to recycle because it combines plastic and metal and there was no process to economically recycle the package. (Whiting, CX 1221 at 114-115; CX49K.) California and Kentucky introduced legislation prohibiting its use. Original New York Seltzer tested the Petainer after it was dropped by Coca-Cola, but also met with resistance and dropped the package. Petainer's manufacturer has since sold its equipment to a firm in Japan. (Langer, Tr. 1434-36.)

103. "Glass containers fit the ideal definition of being able to be recycled into the same product an infinite number of times." (CX 91G.) Plastics, according to respondents' expert, has recycling problems:

Polyethylene terephthalate is the principal resin used in soft drink bottle making, and constitutes the most visible problem in connection with packaging solid waste disposal. It cannot be recycled into the same soft drink container because of technical reasons. . . . [P]lastic recycling is estimated at only 1.1 percent of all plastic packaging materials used.

Normal micro biological action has little or no effect on plastic polymers, which is one of the reasons that they were developed initially and are successful. This property suggests that it is not safe to dispose of plastics in landfills, even though that is where most of them now go.

* * * *

The only present answer to plastic packaging disposal is incineration. PET can be burned safely in a modern incinerator. Most presently operating incinerators, however, cannot safely burn PET or any other plastic. . . . This of course increases costs and raises the question of whether the burning of the plastic will ever prove to be economical, even considering the plastic's high energy content. [CX 91I.]

104. Glass and metal can be recycled into the same products. Plastics used for food packaging have no potential for recycling into the same package type; and there is not a big enough market in other end-use products to accommodate even the present quantity of plastic packaging waste. While incineration for its fuel value is a potential solution, there are serious questions regarding the safety of emissions from present incinerators. Until these problems are solved, the long range prospects for plastics are increasingly uncertain. (Zabinko, Tr. 5407; CX 87E.)

C. Use

1. Baby food and baby juice

105. Glass containers for baby food and baby juice are clear, impermeable, retortable, rigid, reclosable, inert, microwaveable and low cost. (Jones, Tr. 512-13; Rottman, Tr. 918; CX 2125A.) Sales of glass jars for this use in 1986 amounted to \$107 million. (CX 35.)

106. Glass is the only container with all the features required for baby food and baby juice. (Rottman, Tr. 921-22.)

107. Clarity is important because of consumer preference. (Jones, Tr. 513-14; Rottman, Tr. 919; CX 2125A.) Metal cans are not clear. (Jones, Tr. 581.)

108. Impermeability prevents oxygen from entering the product and spoiling it, provides increased shelf-life, keeps the product sterilized and maintains nutrition. (Jones, Tr. 519; Rottman, Tr.

919.)⁵ Gerber and Beech-Nut require a shelf-life of two years, which glass containers provide. (Jones, Tr. 514, 587-88; Rottman, Tr. 921.)

109. Plastic PET containers would not provide acceptable shelf-life. (Jones, Tr. 539, 588.) PET would provide a shelf-life of two months. (CX 2212A.) Multi-layer plastic currently provides shelf-life only for certain flavors that are less oxygen-sensitive than others. (Jones, Tr. 585; Rottman, Tr. 926.)

110. High-temperature packing is necessary for baby food and baby juice containers. (Jones, Tr. 514-16; Rottman, Tr. 911-12, 920.) About 50% of baby foods are retorted. (Rottman, Tr. 912.) Juices and the remaining 50% are hot-filled (filled at temperatures from 190-215 degrees for sterilization). The initial filling for both hot-fill and retorted products is the same. The product is filled into the container while hot. Next the product is put in steam and the cap is applied. As the steam condenses, it draws the closure button down. "Hot-fill" foods are kept at their filling temperature for 10-15 minutes. Foods requiring retort are put in pressure cookers (or "retorts") and cooked at 250 degrees. (Rottman, Tr. 911.)

111. Glass is rigid and permits the use of tamper-evident closures with safety buttons. Plastic containers for baby food would require a more costly closure than glass containers. (Jones, Tr. 517, 527.)

112. The rigidity of glass also makes possible high-speed filling lines. (Jones, Tr. 517-18; Rottman, Tr. 913.) Plastic containers would require new filling equipment. (Rottman, Tr. 912.) The slower production rate with plastic containers would require twice as many lines as glass. (Jones, Tr. 529.)

113. Stacking plastic would require stronger corrugated containers to achieve the same vertical stacking strength as glass. (Jones, Tr. 517, 529, 545; Rottman, Tr. 920; CX 1459C.)

114. Glass containers can be resealed and stored for later use. (Jones, Tr. 519.) Metal cans are not readily resealable. (Jones, Tr. 581.)

⁵ Paper cartons used for dry baby cereals cannot package strained baby food. (Rottman, Tr. 913-14; Jones, Tr. 507-08.) When Beech-Nut sets the price for its processed baby food, it does not take into account the price of dry cereal. Jones, Tr. 508.)

115. Inertness of baby food and baby juice containers prevents the flavor of the product from being absorbed into the container and the container from imparting taste to the product. (Jones, Tr. 520-21.) Some plastics absorb flavor into the contents. (Rottman, Tr. 919.)

116. Microwaveability is important for baby food. (Jones, Tr. 519-20.)

117. There is no clear plastic container commercially available in the United States today that could be used for retorted baby food products. (Jones, Tr. 525; Rottman, Tr. 922- 24; Gigliotti, Tr. 5689-90, 5736, 5748.) Plastic tends to soften at high temperatures, which would distort the container. (Rottman, Tr. 925.) Retortable plastic containers are not clear, are higher price than glass, and do not have screw-top resealability. (Gigliotti, Tr. 5715, 5717, 5728.)

118. There is no clear wide-mouth plastic container commercially available in the United States today that could be used for hot-filled baby food or baby juice products. (Zoon, Tr. 55; Carter, Tr. 2532, 2587; Zabinko, Tr. 5422, 5425.) Plastic containers could be used for some wide-mouth hot-fill products, but these containers are not clear, are high cost, and provide a reduced shelf-life. (Rottman, Tr. 925-26.)

119. Beech-Nut concluded that there were several "obstacles" to plastic containers for baby food and baby juice, including: closure, cost, production and warehousing. (CX 1459B-C.)

120. With present technology, the cost of any plastic container that could be used for baby food would be far in excess of the cost of glass. (Blecharz, Tr. 4877; Jones, Tr. 523-24.)

121. A plastic container for baby food would require from a year and one-half to three years to develop. (CX 1459C; CX 2113A.)

122. Producers of baby food and baby juice would not shift from glass to plastic if the price of glass containers were to increase by 5-10%. (Jones, Tr. 529, 535; Rottman, Tr. 934.)

123. If the price of glass containers were to increase by 5-10%, producers of baby food and baby juice would not shift to metal containers because cans are not clear or resealable, and do not project the same quality image as glass. (Jones, Tr. 521-22; Rottman, Tr. 922-23, 934.)

124. It may be five years before a clear, high barrier, retortable, plastic container that is cost competitive with glass will become

commercially available to package baby food. (Rottman, Tr. 933; Zabinko, Tr. 5400.)

125. In late 1986 or 1987, Gerber began marketing some of its baby juice in a 4.0 ounce plastic "Gamma" container produced by American-National Can. (Jones, Tr. 530-32; Rottman, Tr. 927-28.) This container took about two years to develop. (Rottman, Tr. 927.)

126. Gerber's purchases of the Gamma container is one-half of one percent of its annual volume of its container purchases. Gerber also packages baby juice in plastic 750 milliliter container. (Rottman, Tr. 908.) Its purchases of the 750 milliliter container is about 1% of its total. (Rottman, Tr. 908.) Gerber had to install new filling lines to accommodate the plastic juice containers. (Rottman, Tr. 912.)

127. The Gamma container used by Gerber for juice is not clear like glass, but rather is translucent or "contact clear," (the color of the contents is only partly discernible). (Jones, Tr. 533.) The marketing department at Beech-Nut believes that the container has insufficient clarity for Beech-Nut's products. (Jones, Tr. 584.)

128. The Gamma containers for juice are multi-layer, but are not impermeable. (Rottman, Tr. 929.) They provide less shelf-life than glass. (Jones, Tr. 585.)

129. Gerber has had no savings in freight that resulted from the lighter weight of plastic. (Rottman, Tr. 930.) The plastic containers for juice are weaker than glass. (Rottman, Tr. 930.) As a result, juices packaged in plastic cannot be stacked as high as glass during storage and distribution. (Rottman, Tr. 930.)

130. These plastic containers for juice cost twice as much as glass. (Rottman, Tr. 924, 927; Jones, Tr. 533.) Gerber's 4.0 ounce juice in plastic sells for more at retail than glass. (Rottman, Tr. 927 (juice in plastic priced at \$.07 more than glass, or about a 20-25% premium).)

131. Gerber's 4 oz. plastic juice containers have not been successful and the company is not planning to extend its marketing beyond its current limited geographic area because "consumers seem to prefer the glass container for those items." (Rottman, Tr. 927-28.)

132. Plastic baby juice containers have a high price relative to glass, as well as other problems. (Zoon, Tr. 53; CX 402B; CX 2128B.) However, Heinz's 25.3 oz. plastic container replaced a glass

container, and 50% of Heinz baby juice sales are packaged in plastic containers. (Blecharz, Tr. 4857.)

133. Mr. Lanigan, Owens' Chairman, does not believe that plastic is an alternative today for baby food. (CX 1224 at 32.)

2. Spaghetti sauce

134. Sales of glass spaghetti sauce jars in 1986 amounted to \$115 million. (CX 35.) The sale of spaghetti sauce packaged in glass containers has increased five fold in the last fifteen years. This product has largely replaced the use of tomato sauce and tomato paste packaged in cans. (Jardis, Tr. 1412.)

135. Glass spaghetti sauce containers are convenient, resealable, clear, impermeable, inert, recyclable, can be hot-filled, microwaved, and have a quality image. (Jardis, Tr. 1320-21)

136. Spaghetti sauce is hot-filled at 185 to 205 degrees (Jameson, Tr. 797; Jardis, Tr. 1321), and sauce with meat or vegetables is retorted. (Gigliotti, Tr. 5677; Buttermore, CX 24Z19; CX 205Z2.)

137. Metal cans are not a ready substitute for spaghetti sauces packaged in glass because cans are difficult to open, are not resealable, not clear, perceived to impart a "tinny taste" and perceived to be an inferior package in terms of quality. (Jameson, Tr. 795; Jardis, Tr. 1321, 1325; Buttermore, CX 24Z25.)

138. Producers of spaghetti sauce who use glass containers would not switch to metal cans if the price of glass containers were to increase by 20%. (Jameson, Tr. 795; Jardis, Tr. 1325.)

139. Hunt-Wesson introduced spaghetti sauce in a can two years ago (Stollsteimer, Tr. 4317), on January 31, 1987; the retail selling price for Hunt's new spaghetti sauce was \$1.99. (CX 2163B.) On January 30, 1988, Hunt's retail price had dropped by 34% to \$1.32, and the company had a share of 4.4%. (CX 2163B.) Eleven months later, the product's retail selling price dropped 17% to \$1.10 and its share dropped to 4.3%. (CX 2163C.)

140. Plastic containers would not be an acceptable substitute for glass because of clarity, shelf-life and permeability problems, the lack of rigidity that would cause plastic to collapse under a vacuum, and the unavailability of a wide-mouth, clear, hot-fillable container. (Jameson, Tr. 795-96; Jardis, Tr. 1330; Carter, Tr. 2532.)

141. There are no commercially available clear wide-mouth plastic containers that could be used for hot-packed food products such as spaghetti sauce. (Jameson, Tr. 824; Jardis, Tr. 1325; Carter, Tr. 2532.)

142. Tomato sauce and spaghetti sauce turn brown from oxidation. (Zabinko, Tr. 5432-33.)

143. Producers of spaghetti sauce who use glass containers would not switch to plastic if the price of glass were to increase by 20%. (Jameson, Tr. 797; Jardis, Tr. 1330.)

144. Ragu tested a plastic container used by "Furmano's," a company with less than one percent of the market. The wall on the container collapsed, it was not possible to get a proper seal on the container, and Ragu deemed the package "unacceptable." (Jameson, Tr. 796.) The package is viewed as "inferior" by Borden because it must be opened with a can opener, has a limited shelf-life, no consumer appeal, lacks a quality image, and is not properly reclosable. (Jardis, Tr. 1327-29, 1368-69.) The price of this product relative to glass is irrelevant to Borden. (Jardis, Tr. 1330.)

145. Owens' own Plastic Products Division has decided not to pursue development of a plastic spaghetti sauce container because of "poor economics." (CX 242A.)

3. Jams and jellies

146. Jams and jellies are hot-packed, and clarity, inertness, impermeability and recloseability are important attributes of glass for this end-use. (F 147-156.) Sales of glass containers for jams and jellies in 1986 amounted to \$66 million. (CX 35.)

147. Clarity is an important attribute of glass in packaging jams, jellies and preserves. Ease of reclosing is also important. (Buttermore, CX 24Z30.) Metal cans do not offer either of these features, and consumers consider them to be unacceptable for packaging jams and jellies. Producers of jams, jellies and preserves would not switch to metal cans if the price of glass were to increase by 5-10 percent. (Rembert, Tr. 144; Clements, Tr. 752; Willers, Tr. 1705-06.)

148. Containers for jams, jellies and preserves must withstand high-temperature. These products are filled at 185 to 200 degrees. Hot-filling is necessary to obtain the gel, kill bacteria, and form a

vacuum inside the container to pull down the safety button on the cap. (Willers, Tr. 1704.) This restricts the container to glass which can withstand hot-filling. (Rembert, Tr. 134.)

149. Inertness is important in packaging jams and jellies. (Buttermore, CX 24Z30.)

150. Impermeability is critical for jams and jellies. Some of the fruits used are oxygen-sensitive, so that the container requires a high oxygen barrier. Plastic resins have not proven acceptable. (Erwin, Tr. 5137-38; Zabinko, Tr. 5391, 5447-48; CX 1007G.)

151. There are no clear, wide-mouth hot-fillable plastic containers commercially available in the United States that would meet the requirements for packaging jams, jellies and preserves. (Rembert, Tr. 137; Willers, Tr. 1705-07; Carter, Tr. 2532.)

152. Welch packages some jelly in a squeezable plastic container. The container is not clear (Willers, Tr. 1707-08) and has five different layers of plastic. These multiple layers are necessary to serve as an oxygen barrier and to provide rigidity and stability in the hot-fill process. (Rembert, Tr. 135.)

153. To use a squeezable, multi-layer plastic container Welch has to reformulate its jelly and modify filling lines. (Rembert, Tr. 135-36, 139.) The plastic squeeze container runs 25% slower than glass, which increases Welch's product costs. (Rembert, Tr. 139.) Plastic containers have more quality problems than glass on the filling line. (Rembert, Tr. 139-40.)

154. Welch's squeezable plastic package is more costly than glass. (Rembert, Tr. 136.)

155. The squeezable jelly package has problems of its high relative cost, lack of clarity, and difficulty in dispensing all of the product. (Clements, Tr. 754; Willers, Tr. 1707-08.) Welch's sales of squeezable jelly have declined by 50% and the company discontinued several flavors and only grape flavors remain. (Rembert, Tr. 140-41, 246.) Other jelly producers introduced squeezable jelly containers, but withdrew them from the market. (Rembert, Tr. 141; Willers, Tr. 1708; Erwin, Tr. 5136.) The producer of the package, American-National Can, regards the squeezable jelly container as unsuccessful because consumer acceptance is low. (Zoon, Tr. 52; Willers, Tr. 1708.)

156. Welch would not shift more of its jams and jellies into this squeezable plastic container if the price of glass were to increase by 5-10%. (Rembert, Tr. 142.)

4. Pickles

157. In pickle jars, clarity, impermeability, recloseability, relative costs, and the ability to withstand high temperature packing are important attributes of glass. Sales of glass jars for pickles in 1986 amounted to \$111.5 million. (CX 35.)

158. There are three categories of pickles: "fresh pack," "process pack," and "refrigerated." Fresh pack pickles are processed by putting cucumbers into jars with flavors and seasonings, and pasteurizing. Process pack pickles are placed in tanks in brine, vinegar and water, kept there until needed for pickle chips and relishes. Refrigerated pickles are processed like fresh pack pickles, but are not pasteurized. (Faulkner, Tr. 1260.)

159. Clarity is an important attribute of pickle jars for consumers because pickles are an "impulse purchase" item. If the price of glass containers were to increase by 5 to 10 percent, Cates would not switch from glass to metal cans for its retail sizes of pickles. (Faulkner, Tr. 1271.)

160. Resealability and the ability to withstand the high temperatures of pasteurization also are important attributes of containers for pickles. (Buttermore, CX 24Z26-Z27; CX 202G-H.)

161. Impermeability is an important attribute of glass for packaging pickles because of the long shelf-life required. (Faulkner, Tr. 1265; CX 202G.) Some institutional pickles are packed in large plastic containers. (Faulkner, Tr. 1286; RX 1002F.) Shelf-life is reduced to about six months because of oxygen permeation and the transfer of a plastic taste to the pickles. Such problems do not occur with glass containers. (Faulkner, Tr. 1305.) Brockway acknowledges that plastic does not provide sufficient shelf-life for packaging pickles. (Coakley, CX 23Z78-Z79.)

162. Based on an evaluation of a possible plastic pickle container designed by Owens, Cates concluded that plastic would be approximately 60% more expensive than glass for a container that was not clear. (Faulkner, Tr. 1265-67.)

163. There is no clear, wide-mouth plastic container that is economically feasible for packaging retail sizes of hot-packed pickles. (Zoon, Tr. 55; Faulkner, Tr. 1265; Carter, Tr. 2532.)

164. Cates began marketing some of its relish in a squeezable plastic container about two years ago. The product "has not been successful" because of dispensing problems and the relative cost of the package; only about "1 percent or less" of Cates' relish sales are in this squeezable plastic container, with the remainder in glass. (Faulkner, Tr. 1267-69.) On the other hand, Heinz's pickle relish is packed in a squeezable plastic container and achieved a 48% share of the market in 1988. (RX 1029G.)

5. Shelf-stable juice

165. Shelf-stable juice is sold in cans and in glass and plastic containers, and in aseptic cartons. About 47% of retail sales of shelf-stable juice is in non-glass containers. (Bourque, Tr. 2062, 2102-08; Bachev, Tr. 3329-30.) Sales of glass containers for shelf-stable juice in 1986 amounted to \$260 million. (CX 35.)

166. Shelf-stable juices are juices that are packaged and sold without refrigeration or chilling. (Rembert, Tr. 144.) These products are hot-filled at 180 to 195 degrees. (Langer, Tr. 1436.) The purpose of hot-filling is to kill microorganisms in the juice and to sterilize the container. (Bourque, Tr. 2064.)

167. Producers of shelf-stable juices who use glass do so because of consumer preference, clarity, taste perceptions, resealability, impermeability, shelf-life, the hot-fill nature of the product, relative costs, image and recyclability concerns. (Rembert, Tr. 147-49; Willers, Tr. 1712, 1716-17; Bourque, Tr. 2065, 2068-69, 2114.)

168. Ocean Spray packages some of its juice products in 5½ ounce metal cans and in 46 ounce metal cans for the institutional food service business. The company does not use metal cans for retail consumer packages because "clarity is an important feature to the consumer." (Bourque, Tr. 2062, 2079.) Beatrice/Hunt-Wesson packages its shelf-stable tomato juice in 5 1/4 oz., 15 oz. and 46 oz. cans. (Stollsteimer, Tr. 4323.) Sales of juice in metal cans have been declining because of relative costs and consumer preferences. (Rembert, Tr. 158-59; CX 266D.)

169. Producers of shelf-stable juice who use glass containers would not shift from glass to metal cans if the price of glass were to increase by from 5% to 20%. (Langer, Tr. 1443; Willers, Tr. 1725.)

170. There is no clear plastic container commercially available in the United States that is cost competitive with glass for the packaging of shelf-stable juices, except for certain juices in the largest sizes. (Zoon, Tr. 56; Rembert, Tr. 149; F 178.) Plastic containers are not used for shelf-stable juices in most sizes because of inadequate shelf-life (Willers, Tr. 1720-21), excessive costs relative to glass (Zoon, Tr. 56), clarity problems (Willers, Tr. 1720-21), lack of rigidity, inability to be hot-filled (Langer, Tr. 1439), and the cost of necessary line modifications. (Rembert, Tr. 153.)

171. Shelf-life is important in the packaging of shelf-stable juices because they are highly sensitive to oxygen, which causes darkening and deterioration of some juices. (Bourque, Tr. 2076-77; CX 269A; CX 938Z65.)

172. Juice producers who use glass would not switch from glass to plastic containers if the price of glass containers were to increase by 5% to 20%.⁶ (Rembert, Tr. 155; Langer, Tr. 1449; Willers, Tr. 1725.)

173. Ocean Spray has recently begun packaging cranberry juice in a 64-ounce heat-set PET container. (Bourque, Tr. 2065, 2073.) Quaker Oats uses a similar container for 64-oz. Gatorade. (Bourque, Tr. 2066-67.) Ocean Spray had been evaluating plastics since the mid-1970's, and it took four years to develop this package. (Bourque, Tr. 2067-68)

174. Welch tested 64 oz. hot-fillable PET juice containers in October 1987 and concluded that plastic cost 38% more than glass. (CX 415C.)

175. Modifications that had to be made to Ocean Spray's lines to run the 64-oz. plastic bottle, involving unpacking equipment, rinsers, fillers, cappers, labelers, and packing equipment. These costs dif-

⁶ Borden packages some of its ReaLemon and ReaLime in small plastic containers that are in the shape of lemons and limes. If the price of glass containers were to increase, Borden would not shift more of its product into these novelty packages. (Willers, Tr. 1726-28.)

ferred by line, but were in excess of \$500,000 per line. (Bourque, Tr. 2071.)

176. Heat-setting is a process that allows PET to be used for some juices that are hot-fillable. (Bourque, Tr. 2065; CX 45E.) Regular PET will deform when filled at a temperature over 165 degrees and, as a result, cannot be used for hot-filled products. (Bourque, Tr. 2065-66.) Heat-set PET is not guaranteed above 190 degrees.

177. This heat-set plastic container would not be acceptable in sizes smaller than 64 oz. because of relative cost and shelf-life problems. As the container size goes down, the cost for plastic versus glass increases, so that the price premium for smaller sizes would be greater than it is in the 64 oz. size. (Bourque, Tr. 2075.) In addition, shelf-life decreases as the plastic container size gets smaller because there is more product (relative to volume) exposed to the walls of the container.⁷ (Rembert, Tr. 154; Bourque, Tr. 2076.)

178. Ocean Spray markets only cranberry-based flavors in the 64 oz. heat-set PET container because there might be a reduction in shelf-life for citrus juices. (Bourque, Tr. 2073.)

179. The 64 oz. heat-set PET container costs more to run on the filling lines because plastic is not as stable as glass, so the lines have to run slower. (Rembert, Tr. 152; CX 415A.) There are problems with leakage (Rembert, Tr. 154, 227; CX 415A), labeling (CX 415B), collapsing during hot-filling (CX 415C), and absorption of flavors. (CX 88B.)

180. Welch's evaluated a 64 oz. plastic container, but determined that it would not be a suitable substitute for glass. (Rembert, Tr. 150-51; CX 415A-D, CX 1456.)

181. Some juices are packaged in aseptic cartons for children's lunch boxes. (Rembert, Tr. 160-61.)

182. Aseptic packages have high cost relative to glass, short shelf-life (6 months for aseptic, two years for glass), leakage, and slow filling line speeds causes difficulties with stacking, vending, retail costs, and brand image. (CX 51Q; CX 265B; CX 266C-D; CX 1022Z141-Z142; CX 1023L.)

⁷ Because of its impermeable nature, this is not true of glass. (Rembert, Tr. 155.)

183. Respondents' expert, Mr. Cavanagh, concluded that "hot-filled juice drinks will remain a large glass market" despite aseptics, "based in part on consumer mistrust of aseptic cartons, and the presence of a more convenient reclosure feature on most glass bottles." (CX 90I.) Kraft has evaluated aseptic packaging for juices, but decided not to go forward with it because "people wouldn't buy it." (Erwin, Tr. 5138-39.)

184. If the price of glass containers increased 5 to 10%, juice producers who use glass would not shift more to aseptic packages. (Rembert, Tr. 161; Bourque, Tr. 2081.)

6. Mayonnaise

185. Glass containers are used for mayonnaise and other spoonable dressings. In this end-use, clarity, recloseability, relative costs, impermeability and quality image distinguish glass from other types of containers. (F 186-190.) Sales of glass jars for this use in 1986 amounted to \$129 million. (CX 35.)

186. Clarity is important for mayonnaise containers because consumers want to see the color and consistency of the product. (Mitchell, Tr. 659; Willers, Tr. 1695; Buttermore, CX 24Z25.)

187. Impermeability is important because the product is oxygen-sensitive. (Clements, Tr. 756-57; Willers, Tr. 1695; Buttermore, CX 24Z25.)

188. The image that the glass container projects to the consumer is important in marketing mayonnaise.⁸ (Mitchell, Tr. 659; Willers, Tr. 1696.)

189. Recloseability is an important attribute of mayonnaise containers. (Buttermore, CX 24Z25.)

190. Only glass containers fulfill the necessary requirements for the consumer sizes of mayonnaise.⁹ (Willers, Tr. 1696, 1821; Trumbull, CX 25Z52.)

⁸ Hellmann's mayonnaise is packaged in a plastic tube "in Europe someplace." The American consumer has a different taste perception of how mayonnaise should be packaged. (Mitchell, Tr. 667-68; Gigliotti, Tr. 5718-19.)

⁹ The U.S. Government's bid programs for gallon mayonnaise require that the product be in glass. (Willers, Tr. 1812, 1829.)

