In the Matter of

BASF WYANDOTTE CORPORATION

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

Docket 9125. Complaint, April 5, 1979—Final Order, July 12, 1982

This order upholds the Administrative Law Judge's May 14, 1982 Initial Decision in this matter and effects dismissal of the complaint on July 13, 1982. The complaint charged the wholly-owned American subsidiary of a German chemical corporation with antitrust violations in the organic pigments market.

Appearances

For the Commission: *Glenn M. Fellman, James K. Leonard, Leo J. Asaro* and *David Marx, Jr.*

For the respondent: *James T. Halverson, Thomas M. Geisler, Jr., Leonard Gross, Bradford Anderson, Prisilla Elliot, Paul E. Francis* and *John P. Walsh, Shearman & Sterling,* New York City.

Complaint

The Federal Trade Commission, having reason to believe that the above-named Respondent, subject to the jurisdiction of the Commission, has acquired the Pigments Division of Chemetron Corporation, a wholly-owned subsidiary of Allegheny Ludlum Industries, Inc., which acquisition violates 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:

Definition

For purposes of this complaint the following definition shall apply:

Organic pigments - insoluble color particles characterized by a chemical composition which includes carbon rings or chains as the basic part of their molecular structure and used to impart color to a variety of materials.

BASF Wyandotte Corporation

1. Respondent BASF Wyandotte Corporation (BWC) is a corporation organized under the laws of the State of Michigan, with its principal place of business at 100 Cherry Hill Road, Parsippany, New Jersey. [2]

2. BWC is a wholly-owned subsidiary of BASF America Corporation which in turn is a wholly-owned subsidiary of BASF Aktiengesellschaft (BASF A.G.), a West German corporation with headquarters in Ludwigshafen, West Germany.

3. BASF A.G. manufactures and sells organic pigments and organic pigment formulations throughout the world.

4. BWC sells organic pigments and organic pigment formulations in the United States.

5. In its fiscal year ended December 31, 1977, BWC had total sales of approximately $786,000,000 of which domestic sales of organic pigments totaled approximately $8,000,000.

6. BWC is the thirteenth largest seller of organic pigments in the United States.

The Chemetron Pigments Division

7. Chemetron Corporation (Chemetron) is a corporation organized under the laws of the State of Delaware, with its principal place of business at 111 E. Wacker Drive, Chicago, Illinois.

8. Chemetron is a wholly-owned subsidiary of Allegheny Ludlum Industries (Allegheny), a corporation organized under the laws of the State of Pennsylvania, with its principal place of business at 2700 Two Oliver Plaza, Pittsburgh, Pennsylvania.

9. Prior to its acquisition by BWC, Chemetron's unincorporated Pigments Division (CPD) produced and sold organic pigments throughout the United States.

10. In its fiscal year ended January 1, 1978, CPD's sales of organic pigments were approximately $35,000,000.

11. CPD is the fourth largest seller of organic pigments in the United States.

Jurisdiction

12. At all times relevant herein BWC has been engaged in the sale of organic pigments in interstate commerce and the assets of CPD have been and are used in interstate commerce, and BWC and CPD are engaged in commerce as "commerce" is defined in Section 1 of the Clayton Act, as amended, 15 U.S.C. 12, and the businesses of BWC and CPD are in or affecting commerce as "commerce" is defined in Section 4 of the Federal Trade Commission Act, as amended, 15 U.S.C. 44. [3]

The Acquisition

13. On or about November 18, 1978, BWC and Allegheny entered into a definitive agreement which provided, *inter alia,* for the acquisition by BWC of the assets of Chemetron's Pigment Division.

14. On or about March 23, 1979, BWC acquired the assets, business and property of CPD.

Trade and Commerce

15. The relevant line of commerce is the sale of organic pigments and submarkets thereof.

16. A relevant section of the country or geographic market is the continental United States.

17. The sale of organic pigments is concentrated, with the combined market share of the four largest sellers estimated to be approximately 52%.

18. Barriers to entry into the manufacture and sale of organic pigments are substantial.

Competition

19. Prior to the acquisition, BWC and CPD were and had been for many years actual competitors of each other in the organic pigments market and submarkets thereof and actual competitors of others in the organic pigments market and submarkets thereof throughout the United States.

20. In 1977, BWC accounted for approximately 2.0% of United States sales of organic pigments and CPD accounted for approximately 9.2% thereof.

21. BASF A.G. is a worldwide leader in the production and sale of organic pigments and had manifested a long standing interest in increasing its share of the U.S. organic pigments market.

Effects; Violation Charged

22. Due to various factors, including BASF A.G.'s worldwide sales and production position in organic pigments and its research and development capability, BWC's 2% share understates its competitive strength in the U.S. market.

23. The effects of the acquisition may be to substantially lessen competition or tend to create a monopoly 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) actual competition between BWC and CPD in the sale [4]of organic pigments and submarkets thereof will be eliminated;

(b) actual competition between competitors generally in the sale of organic pigments and submarkets thereof may be lessened;

(c) the likelihood of increased participation by BWC and BASF A.G. in the U.S. organic pigments market and submarkets thereof by alternative means will be eliminated;

(d) CPD will be eliminated as an actual substantial independent competitor in the sale of organic pigments and submarkets thereof;

(e) the combined operation will be ranked number three in the organic pigments market thus increasing concentration in the sale of organic pigments and diminishing possibilities for eventual deconcentration; and

(f) mergers or acquisitions between other organic pigment manufacturers may be fostered, thus causing a further substantial lessening of competition and tendency toward monopoly in the sale of organic pigments.

Initial Decision by

Montgomery K. Hyun, Administrative Law Judge

May 14, 1982

Preliminary Statement

By Complaint issued on April 5, 1979, the Federal Trade Commission ("FTC" or "Commission") charged BASF Wyandotte Corporation ("BWC"), a wholly-owned subsidiary of BASF Aktiengesellschaft ("BASF AG" or "BASF") with a 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(a)(1)), by virtue of its acquisition of the Pigments Division of Chemetron Corporation ("CPD") from Allegheny Ludlum Industries, Inc. on March 3, 1979. BWC filed its Answer on May 4, 1979 admitting in part and denying in part the various allegations of the Complaint.

The Complaint alleged that prior to the acquisition, BASF, which manufacturers and sells organic pigments throughout the world, sold organic pigments in the United States through its wholly-owned [2]subsidiary, BWC. (Complaint ¶ 1–6). The Complaint also alleged that CPD produced and sold organic pigments throughout the United States. (Complaint ¶ 7–11).

Organic pigments and submarkets thereof were alleged to be the relevant lines of commerce for the purpose of evaluating the competitive effects of the acquisition. (Complaint ¶ 15). Subsequent to the issuance of the Complaint, complaint counsel designated phthalocyanine pigments as an appropriate submarket in which to analyze the effects of the acquisition. The Complaint further charged that the alleged organic pigments market was concentrated and that barriers to entry into the market were substantial. (Complaint ¶ 17–18).

The Complaint further alleged that prior to the acquisition, BWC and CPD had been actual competitors in the markets and that their shares of the organic pigments market were approximately 2% and 9.2%, respectively. (Complaint ¶ 19–20). It also alleged that BASF had manifested a long-standing interest in increasing its share of the United States organic pigment market. (Complaint ¶ 21–22).

The Complaint finally alleged that BWC's acquisition of CPD would tend to substantially lessen competition in the alleged markets in the following ways:

(a) actual competition between BWC and CPD in the sale of organic pigments and submarkets thereof will be eliminated;

(b) actual competition between competitors generally in the sale of organic pigments and submarkets thereof may be lessened;

(c) the likelihood of increased participation by BWC and BASF AG in the U.S. organic pigments market and submarkets thereof by alternative means will be eliminated;

(d) CPD will be eliminated as an actual substantial independent competitor in the sale of organic pigments and submarkets thereof;

(e) the combined operation will be ranked number three in the organic pigments market, thus increasing concentration in the sale of organic pigments and diminishing possibilities for eventual deconcentration; and [3]

(f) mergers or acquisitions between other organic pigment manufacturers may be fostered, thus causing a further substantial lessening of competition and tendency toward monopoly in the sale of organic pigments. (Complaint ¶ 23).

The parties conducted extensive discovery between themselves and non-party industry competitors prior to the trial of this matter. Complaint counsel conducted an industry-wide survey respecting the production and sale of organic pigments and phthalocyanine pigments for the years 1977–1979. Counsel for respondent subpoenaed profitability data from several organic pigments manufacturers.

The proceeding originally assigned for trial to Administrative Law Judge James P. Timony, April 6, 1979, was reassigned to Administrative Law Judge Paul Teetor on March 19, 1980, and upon Administrative Law Judge Teetor's retirement, to Administrative Law Judge Montgomery K. Hyun on February 19, 1981.

The trial of this matter began on March 30, 1981 in Chicago, Illinois. The case-in-chief was completed on May 1, 1981. The defense case was presented in New York, New York and began on or about June 1, 1981. Hearings continued on a regular basis through the beginning of September 1981. Rebuttal evidence was presented in Chicago during the last week of October and in New York in early December 1981. Surrebuttal was concluded on December 5, 1981. In all, testimony was taken from 46 witnesses, including 13 called by complaint counsel and 33 by counsel for respondent. The record consists of some 12 thousand pages of transcripts of testimony and several thousand pages of documentary exhibits.

The record was closed on December 18, 1981. By an Order dated January 18, 1982, the Commission extended the time for the filing of an initial decision to and including May 14, 1982. The following witnesses gave testimony in this proceeding:

Witnesses Called By Complaint Counsel

Heinz Geiss	Vice-President of Sales and Marketing, Industrial Chemicals Division American Hoechst Corporation (Tr. 2051–52)
David R. Kamerschen, Ph.D.	Distinguished Professor of Economics University of Georgia (CX 7001; Tr. 10,794) [4]
Alan E. Krause	Consumer Protection Specialist Federal Trade Commission (Tr. 931)
Jeffrey M. Lipton	Former Director, Colored Pigment Production Division E.I. Du Pont de Nemours & Co. (Tr. 1591–92)
William O. Nicoll	Vice President, former General Manager, Coatings, Specialty Products Hercules, Inc. (Tr. 10,657)
Sol Panush	Manager of Color, Plastics and Specialties Division Celanese Corporation (Tr. 2691–99)
Paul Papillo	Vice-President, Plastics and Additive Division CIBA-GEIGY Corporation (Tr. 1764–66)

Witnesses Called By Complaint Counsel

Erhard R. Schober	Director of Marketing, Pigments Division Mobay Chemical Corp. (formerly Harmon Colors Corp.) (Tr. 1637)
Hugh M. Smith, Ph.D.	Director of Research & Development, Pigments Division Sun Chemical Corporation (Tr. 1287)
Dr. Klaus Stammen	President Siegwerk, Inc. (Tr. 2376–77)
John Toogood, Ph.D.	General Manager, Colors Department Harshaw Chemical Company (Tr. 12,106)
Allan Weissglass	President Magruder Color Company, Inc. (Tr. 2481)
Harold C. Whittemore, Jr.	Senior Vice-President Sun Chemical Corporation (Tr. 1907–08) [5]

Witnesses Called By Respondent

Morris Adelman, Ph.D.	Professor of Economics Massachusetts Institute of Technology (RX 9015; Tr. 10,020–33)
Dr. Hans Albers	Director BASF AG (Tr. 6158)
Richard L. Alsager	Manager of Marketing Research BASF Wyandotte Corporation (Tr. 3508)
Eli M. Aschner	Tenneco, Inc. (former Marketing Manager, BWC) (Tr. 5333)
Theodore Bluey	Partner Deloitte, Haskins & Sells (Tr. 6325)
Dr. Gustav Bock	Director, Pigments & Auxiliaires Applied Technology Department Leader, Development Group BASF AG (Tr. 3389–91)
Roger Brinner, Ph.D.	Vice-President Data Resources, Inc. (Tr. 7662–77)

Witnesses Called By Respondent

James Canon, Ph.D.	Consultant of BWC, former Vice President of Harshaw Chemical (Tr. 12,581)
Jerome E. Counihan	Former President of CDP and Consultant, BASF Wyandotte Corporation (Tr. 5521)
Jerome Bruce Giniger	Vice-President Pope Chemical Corporation (Tr. 7205–06)
Michael L. Glassman	President Glassman-Oliver Economic Consultants, Inc. (RX 9003; Tr. 8340) [6]
Dr. Erwin Hahn	Director, Dyestuffs and Pigment Research Laboratory BASF AG (Tr. 3947–53)
Laurie Hiscock	Works Manager, Huntington Works BASF Wyandotte Corporation (Tr. 6012)
Kurt Kiesling	Works Manager, Holland Plant, BASF Wyandotte Corporation (Tr. 6078)
Dr. Josef F. Kohnle	Group Vice-President BASF Wyandotte Corporation (Tr. 4386–87)
Abraham Lindenhauer	Vice-President of Technical Services GAF Corporation (Tr. 7490)
Charles S. Long	Manager of Division Engineering BASF Wyandotte Corporation (Tr. 5795–96)
Paul Malchick, Ph.D.	General Manager, Chemetron Pigments Division BASF Wyandotte Corporation (Tr. 2813–28)
Jesse W. Markham, Ph.D.	Charles Edward Wilson Professor of Economics Harvard University (RX 9002; Tr. 7902–40)
Herbert A. McKenzie	President Hilton-Davis Chemical Group Sterling Drug, Inc. (Tr. 6736–37)

Witnesses Called By Respondent

Frank Edward McKulka	Manager of Economic Analysis and Planning BASF Wyandotte Corporation (Tr. 7532)
Dr. Rolf Mecke	Member Division of Economic Evaluation BASF AG (Tr. 4152–55)
Charles H. Mertz	Vice-President, Customer Service Group Applied Color Systems (Tr. 7054) [7]
Karl Muench	Director, Sparte CP BASF AG (Tr. 3770)
Michael Peter Parker	Manager, Dyestuffs and Intermediates, Organics Division ICI, Ltd. (Tr. 4936–38)
Walter Schmiedeskamp	Partner Deloitte, Haskins & Sells (Tr. 6967)
Michael Stavar	Accountant BWC (Tr. 7233)
Dr. Erich Stoeckl	Director, Pigment Production BASF AG (Tr. 5014–15)
Clayton A. Sweeney	Executive Vice-President and Chief Administrative Officer Allegheny International (Tr. 7370)
Harold Thiemer	Accountant BASF AG (Tr. 6736–37)
Peter Tschirch	Controller BASF AG (Tr. 5184)

The proposed findings of fact and conclusions of law submitted by the parties and their arguments in support thereof have been given careful consideration by the administrative law judge and to the extent not adopted by this Initial Decision, in the form proposed or in substance, are rejected as not supported by the evidence or as immaterial. Any motion appearing on the record not heretofore or hereby ruled upon either directly or by the necessary effect of the findings and conclusions made in this Initial Decision are hereby denied.

Upon consideration of the entire record in this proceeding and having considered the demeanor of the witnesses, the administrative [8]law judge makes the following findings of fact and conclusions of law and order based on the record considered as a whole.[1][9]

FINDINGS OF FACT

I. THE IDENTITY OF THE ACQUIRING AND THE ACQUIRED FIRMS

A. *BASF AG And Its Business*

1. The BASF Group is comprised of BASF Aktiengesellschaft (AG) and all companies which are at least 50% owned by BASF AG or its majority holdings. (RA 1; CX 51B).

2. BASF AG (hereinafter "BASF") is a West German corporation with headquarters in Ludwigshafen, the Federal Republic of Germany ("FRG" or "West Germany"). BASF is engaged in six lines of business:

> Basic Petrochemicals, including oil, gas, and petroleum products such as fuel oil, naphtha, and benzene;

[1] The following abbreviations were used in this Initial Decision:

CB	Memorandum In Support of Complaint Counsel's Proposed Findings
RB	Respondent's Brief in Support of Proposed Findings
CPF	Complaint Counsel's Proposed Findings
RPF	Respondent's Proposed Findings
CX	Complaint Counsel's Exhibit
RX	Respondent's Exhibit
(Tr.)	Transcript Reference
(Name Number)	Testimony of the Named Witness at Listed Transcript Page Number
(CC's Admission, §)	Paragraph Number of Complaint Counsel's Responses to Respondent's Admissions
RA	Refers to Respondent's Responses to Complaint Counsel's Second Request for Admissions, dated February 23, 1981 and supplemented on March 30 and April 22, 1982 (No.)
Int. (I)	Refers to Respondent's Answers to Complaint Counsel's First Set of Interrogatories, dated December 24, 1979 and June 26, 1980 (No.)
Int. (II)	Refers to Respondent's Answers to Complaint Counsel's Second Set of Interrogatories, dated November 18, 1980, November 21, 1980 and December 3, 1980 (No.)
Stip.	Refers to Stipulation between Complaint Counsel and Respondent's Counsel (Date)

Agricultural Chemicals, including fertilizers, potash, salts, and crop protection products;

Plastics, including polyolefins, polystyrene, polyvinyl chloride, and specialty plastics;

Chemicals, including basic chemicals, industrial chemicals, intermediates, fine chemicals, and fiber raw chemicals;

Dyestuffs and Auxiliaries, including textile chemicals, pigments and non-textile auxiliaries, and dispersions; and

Consumer Products, including coatings and paints, magnetic recording media, nyloprint, and pharmaceuticals. (CX 51J).

3. The BASF Group manufactures and sells its products all over the world including the European Community, North America, West Europe excluding the European Community, Latin America, South and East Asia, Australia, East Europe, Africa, and West Asia. (CX 51X-Z). **[10]**

4. The BASF Group had the following net sales, earnings, and assets for the years 1971 through 1978:

million $[2]	1971	1972	1973	1974	1975	1976	1977	1978
Net Sales	2,944	3,720	5,384	7,642	7,364	8,338	[***]*	[***]
Net Income	[***]	[***]	[***]	[***]	[***]	[***]	[***]	[***]
Fixed Assets	1,934	2,183	2,625	2,772	3,026	3,084	[***]	[***]
Total Assets	3,309	3,926	4,944	5,668	6,069	6,170	[***]	[***]

(RA 3).

5. Approximately 11% of the BASF Group's net sales were made in North America. (*Compare* RA 5 *with* RA 3). In the years 1977 and 1978 respectively, [***] and [***] of the BASF Group's investments in tangible fixed assets were made in the United States. (RA 6). In 1978 alone, the BASF Group invested almost [***] million in tangible fixed assets in the United States. (RA 6).

6. The BASF Group sold the following quantities and value of organic pigments under the following tradenames in the years 1974–1978: [11]

[2] Deutschemarks converted to Dollars according to the following exchange rates listed in the Federal Reserve Bulletin:

1971	1972	1973	1974	1975	1976	1977	1978
28.768	31.364	37.758	38.723	40.729	39.737	43.079	49.867

Cents per Deutschemark. Because responses to interrogatories, requests to admit facts, and documents often provided value information in a foreign currency, complaint counsel converted the foreign currency to dollars. All conversions from Deutschemarks to Dollars were made according to the exchange rates listed above. The source of these rates, the Federal Reserve Bulletin, is the same source used for the Stipulation dated February 10, 1982.

* Throughout this document, reference to [* * *]indicates where *in camera* material has been excised.

Tradename	1974	1975	1976	1977	1978
Heliogen[3]					
Metric Tons	5,471.1	3,287.0	4,918.2	[***]	[***]
Million $	39.7	27.3	38.7	[***]	[***]
Fanal					
Metric Tons	620.7	322.9	533.6	[***]	[***]
Million $	7.8	4.3	6.8	[***]	[***]
Lithol					
Metric Tons	1,580.1	1,393.2	1,498.7	[***]	[***]
Million $	8.7	8.7	9.2	[***]	[***]
Paliogen					
Metric Tons	243.9	139.8	210.5	[***]	[***]
Million $	8.0	4.8	8.1	[***]	[***]
Paliotol					
Metric Tons	228.7	94.0	127.4	[***]	[***]
Million $	3.5	1.4	2.1	[***]	[***]
Sico					
Metric Tons	1,056.9	632.4	801.6	[***]	[***]
Million $	9.2	6.4	8.0	[***]	[***]
Others					
Metric Tons	247.6	164.4	189.3	[***]	[***]
Million $	1.2	1.0	1.1	[***]	[***]
Total Worldwide[4]					
Metric Tons	9,449	6,033.7	8,279.3	[***]	[***]
Million $	78.1	53.8	74.0	[***]	[***]

(RA 22; 24). **[12]**

7. Until August 1, 1980, BASF was organized according to a divisional principle. (Int. (I) 16). There were ten "Ressorts" which had the following organization codes and titles:

Code	Title
A	Units reporting directly to the chairman
G	Basic Chemicals, Oil and Gas, Agrichemicals
K	Plastics
C	Dyestuffs, Chemicals, Dispersions
V	Consumer Products, Sales Coordination, Distribution
U	Overseas Operations
T	Engineering
W	Research and Development
F	Finance
P	Human Resources

Each "Ressorts" consisted of several "Sparten"—either "Product-

[3] Quantity and value for the Heliogen tradename includes sales of phthalocyanine pigments in the United States under the tradename Paliofast. *See* RA 131; 134–35.

[4] Differences between the total worldwide figures and the sum of the amounts for each tradename by year are the result of rounding errors in conversion from DM to $ and inconsistencies between BWC's responses to RA 22 and RA 24.

Sparten" or "Regional-Sparten." "Product-Sparten" were responsible for sales in Europe and had worldwide chemical/technical responsibilities for the products they handle. "Regional-Sparten" were responsible for sales in their geographical regions outside Europe. (Int. (I) 16). Each of the "Sparten" were further subdivided into divisions, departments, and subdepartments which had progressively narrower areas of responsibility and specialization. *See* RA 7; 9–11; 13–19; 34; 37–40.

8. Until December 31, 1977, Ressort C (dyestuffs, chemicals, dispersions) was organized into four "Product-Sparten" which had the following organization codes and titles:

Code	Title
CF	Dyestuffs and Auxiliaries
CI	Industrial Chemicals
CZ	Intermediates
CD	Dispersions

(RA 9; Int. (I) 20). Sparte Dyestuffs and Auxiliaries ("CF") was responsible for the management of BASF's dyestuffs, pigments, and auxiliaries business. (RA 10). Sparte CF was subdivided into several departments, as follows: **[13]**

Code	Title
CFOS	Staff
CFA	Dyestuff (Production) Division I
CFB	Dyestuff (Production) Division II
CFH	Auxiliaries Division
CFV	Sales - Dyestuffs and Auxiliaries
CFE	Technical Services Department - Dyestuffs and Auxiliaries

(RA 11).

9. In 1970, BASF acquired G. Siegle and Co., GmBH, a manufacturer of organic and inorganic pigments. Until December 31, 1977, Sparte VS (Special Colors) was responsible for the management of the Siegle pigments business. (RA 12; Int. (I) 20).

10. On January 1, 1978, as a result of a reorganization of Ressorts C and V, Sparte Pigments and Auxiliaries ("CP") and Sparte Textile Dyes and Chemicals ("CT") were formed and Sparte CF and Sparte VS were abolished. (RA 12; Int. (I) 20). Thereafter, Sparte CP became responsible for the pigments business previously managed by Sparte VS and for the pigments, pigments dispersions, and non-textile dyestuffs and auxiliaries products previously managed by Sparte CF.

Sparte CT became responsible for the dyestuffs and auxiliaries used for the textile industry. (RA 12; Int. (I) 20).

11. From January 1, 1978 until August 1, 1980, Sparte CP (Pigments and Auxiliaries) was organized into six departments, as follows:

Code	Title
CPOS	Staff
CPP	Pigment Production Division
CPH	Auxiliaries Production Division
CPV	Sales - Pigments and Auxiliaries
CPE	Technical Services Department - Pigments and Auxiliaries
CPOZ	Central Development [14]

(RA 14). Sparte CP also had collateral responsibility over the "U.B. Pigmente" division (formerly the Siegle pigments business) of BASF Farben and Fasern, AG. (RA 12; 14; Int. (I) 20). The "U.B. Pigmente" business (SP) was organized as follows:

Code	Title
ST	Technology
STA	Technical Services Department
SV	Sales

(RA 14).

12. During the period 1971–1979, Sparte CP (and its predecessor Sparte CF) had the following responsibilities respecting BASF's United States organic pigments business: short, middle, and long-range strategic and operations planning; marketing and sales development; production, export planning (in conjunction with Sparte UN); and production technology. (RA 13; Int. (I) 16).

13. Until August 1, 1980, Ressort U (Overseas Operations) was organized into four Sparten, one of which was Sparte UN (North America). (RA 37). Sparte UN was subdivided into three departments, as follows:

Code	Title
UNV	Sales
UNT	Technical Coordination
UNOK	Profit Control

(RA 38).

14. As of March 1979, Sparte UN had the following responsibilities respecting BASF's sale of organic pigments in the United States:

responsibility for the combined results of all United States subsidiaries; planning of exports from Europe (jointly with Sparte CP); handling of exports to BWC; coordination of technology transfer between Sparte CP and BWC; coordination in setting up strategies and plans; and planning and coordination of all major capital investments in tangible fixed assets to be made in the United States (in conjunction with Sparte CP). (Int. (I) 16; RA 39–40). [15]

15. The names and positions of some officers and employees of BASF and BWC are summarized hereinbelow as an aid to understanding the documentary and testimonial evidence in this proceeding.

Dr. Bernhard Timm: From 1971 to February 1981, he held the following positions:

Dates	Position
7/2/74 - present	Chairman, Supervisory Board of BASF
1971 - 7/2/74	Chairman, "Vorstand" (Board of Executive Directors) of BASF AG
1971 - 4/8/74	Member, Board of Directors, BASF Wyandotte Corporation

(RA 41).

Dr. Mathias Seefelder: From 1974 to February 1981, he held the following positions:

Dates	Position
7/2/74 - present	Chairman, "Vorstand" of BASF AG
4/8/74 - 11/15/80	Member, Board of Directors, BWC

(RA 42).

Dr. Hans Albers: From 1971 to February 1981, he held the following positions: [16]

Dates	Position	Code[5]
7/2/74 - 7/31/80	Director, Ressort Dyestuffs, Chemicals Dispersions, BASF AG	C
1/1/74 - present	Member, "Vorstand" of BASF AG	
4/25/78 - present	Member, Board of Directors of BWC	
11/1/71 - 7/1/74	General Manager, Sparte Dyestuffs and Auxiliaries, BASF AG	CF

(RA 43).

Dr. Otto Christmann: From July 1974 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	General Manager, Sparte Textile Dyes and Chemicals, BASF AG	CT
7/2/74 - 12/31/77	General Manager, Sparte Dyestuffs and Auxiliaries, BASF AG	CF

(RA 44).

Karl Muench: From 1971 to August 1, 1980, he held the following positions: [17]

Dates	Position	Code
1/1/78 - 8/1/80	General Manager, Sparte Pigments and Auxiliaries, BASF AG	CP
1971 - 12/31/77	Director, Sales Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFV

(RA 45).

Bernard Hardekopf: From January 1, 1978 to August 1, 1980, he held the position of Director, Sales Department, Sparte Pigments and Auxiliaries, BASF A.G. (CPV). (RA 46).

Werner Scheuer: From 1971 to August 1, 1980, he held the following positions:

[5] An understanding of BASF's system of organization codes is helpful because the authors and recipients of BASF's documents are generally indicated by organization code only.

Dates	Position	Code
1/1/78 - 8/1/80	Deputy Director, Pigments and Soluble Dyes, Sales Department Sparte Pigments and Auxiliaries, BASF AG	CPV/P
1971 - 12/31/77	Deputy Director, Sales Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFV/P

(RA 47).

Dr. Erich Stoeckl: From April 1, 1967 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Director, Pigments Department, Sparte Pigments and Auxiliaries, BASF AG	CPP
[18] 4/1/67 - 1/1/78	Director, Dyes Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFA

While holding both of these positions, Dr. Stoeckl was responsible for BASF's production of organic pigments. (RA 48).

Dr. Schrodel: From 1971 to June 12, 1979, he held the following positions:

Dates	Position	Code
1/1/78 - 6/12/79	Deputy Director, Tricolor Factory, Pigments Department, Sparte Pigments and Auxiliaries, BASF AG	CPP/T
1971 - 12/31/77	Deputy Director, Tricolor Factory, Dyes Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFA/T

(RA 49).

Dr. Brunkhorst: From 1971 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Deputy Director, Azo Factory, Pigments Department, Sparte Pigments and Auxiliaries, BASF AG	CPP/A
[19] 1971 - 12/31/77	Deputy Director, Azo Factory, Dyes Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFA/A

(RA 50).

Dr. Trauth: From 1971 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Deputy Director, Finish Factory, Pigments Department, Sparte Pigments and Auxiliaries, BASF AG	CPP/F
1971 - 12/31/77	Deputy Director, Finish Factory, Dyes Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFA/F

(RA 51).

Dr. Polster: From 1971 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Deputy Director, Pigments Development Laboratory, Pigments Department, Sparte Pigments and Auxiliaries, BASF AG	CPP/P
1971 - 12/31/77	Deputy Director, Development Laboratory, Dyes Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFA/P

(RA 52). [20]

Dr. Norbert Gotz: From 1971 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Director, Technical Services Department, Sparte Pigments and Auxiliaries, BASF AG	CPE
1971 - 12/31/77	Director, Technical Services Department, Sparte Dyestuffs and Auxiliaries, BASF AG	CFE

(RA 53; 16).

Dr. Walter Puff: From 1971 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Deputy Director, Technical Services - "Sonder F" Subdepartment, Sparte Pigments and Auxiliaries, BASF AG	CPE/SF
1971 - 12/31/77	Deputy Director, Technical Services - "Sonder F" Subdepartment, Sparte Dyestuffs and Auxiliaries, BASF AG	CFE/SF

(RA 54). The Technical Services - "Sonder F" Subdepartment of Sparte CP was responsible, *inter alia,* for providing technical assistance and advice to purchasers of BASF's organic pigments through its Market Service Groups. (RA 17–18). [21]

Dr. Gustav Bock: From 1971 to August 1, 1980, he held the following positions:

Dates	Position	Code
1/1/78 - 8/1/80	Leader, Development Group, Technical Services - "Sonder F" Subdepartment, Sparte Pigments and Auxiliaries, BASF AG	CPE/SF1
1971 - 12/31/77	Leader, Development Group, Technical Services - "Sonder F" Subdepartment, Sparte Dyestuffs and Auxiliaries, BASF AG	CFE/SF1

(RA 55).

16. The Development Group of the Technical Services - "Sonder F" Subdepartment of Sparte CP was responsible, *inter alia,* for forwarding requests for development of new or improved organic pigments to the research laboratories or the production site laboratories; checking and testing new or improved products that came from the research laboratories or the production site laboratories; designating new or improved products as so-called "E" (developmental or experimental) products; sampling "E" products to selected customers for testing purposes; and participating in the decision to upgrade the status of an "E" pigment to a so-called "SF" (test product) pigment. As of January 1, 1979, when a product was upgraded from an experimental pigment ("E") to a test product ("SF"), the "Market Opening Pigments and Dyestuffs" group (organization code CPE/SF 3) assumed responsibility for the introduction of the product to interested customers. Prior to the formation of the "Market Opening" group, this responsibility was assumed by the appropriate market service group within the Technical Services - "Sonder F" Subdepartment that served the industry in which the "SF" product was to be used. (RA 21; Puff dep. CX 5094E–F). [22]

Dr. M. Minsinger: From 1975 to August 1, 1980, he was the General Manager, Sparte North America, BASF AG (code UN). As of May 11, 1976, he was also a member of BWC's Board of Directors. (RA 59).

Dr. von Selchow: From 1971 to August 1, 1980, he was the Director, Sales Department, Sparte North America, BASF AG (code UNV). (RA 60).

Gerd Meyer: From 1971 to August 1, 1980, he was the Prokurist-Marketing, Sales Department, Sparte North America, BASF AG (code UNV/M). (RA 61).

Peter Tschirch: From 1977 to August 1, 1980, he was the Prokurist, Profit Control, Sparte North America, BASF AG (code UNOK). (RA 63).

Dr. von Pigenot: From 1973 to August 1, 1980, he was a Member, Technical Coordination - Dyes, Pigments and Auxiliaries, Sparte North Amercia, BASF AG (code UNT). (RA 64).

17. "Commission F" of BASF AG is responsible for reviewing possible acquisitions by BASF and recommending approval or disapproval of the acquisition to BASF's Board of Directors ("Vorstand"). (RA 36).

18. "Commission S" of BASF AG is responsible for reviewing proposed fixed asset investment plans and recommending approval or disapproval of the capital investment plan to BASF's Vorstand. (Muench 3777–78).

B. *BASF Wyandotte Corporation (BWC) And Its Business*

19. BASF Wyandotte Corporation ("BWC") is a corporation organized under the laws of the State of Michigan, with its principal place of business at 100 Cherry Hill Road, Parsippany, New Jersey. (Comp. 1; Ans. 1).

20. BWC was formed in 1971 as the result of a merger of BASF Corporation, a BASF AG subsidiary conducting business in the United States, into Wyandotte Chemicals Corporation, which BASF AG had acquired in 1969. (RA 65–67). [23]

21. As of March 1979, BWC was a wholly-owned subsidiary of BASF America Corporation, a wholly-owned subsidiary of BASF AG. (Comp. 2; Ans. 2; RA 68).

22. As of January 1, 1979, BWC engaged in four main lines of business:

> Industrial Chemicals, including both organic and inorganic chemicals;
>
> Colors and Intermediates, including organic and inorganic pigments, dyestuffs, auxiliaries, agricultural chemicals, plasticizers, and organic intermediates;
>
> Polymers, including urethane and expandable polystyrene; and
>
> Chemical Specialties, including industrial specialties, chemical process specialties, cleaning and sanitizing products, printing plates and equipment, and magnetic recording media.

(RA 71; 73).

23. As of January 1, 1978, BWC maintained the following plants and production sites in the United States:

Bedford, Massachusetts
  Magnetic recording media

Carlstadt, New Jersey
  Leather finishes and protective paints

Charlotte, North Carolina
  Textile and other auxiliaries, leather
  tanning chemicals and dyestuff laboratories

East Stroudsburg, Pennsylvania
  Cleaning and sanitizing products [24]

Geismar, Louisiana
  Chlorine, caustic soda, ethylene oxide,

ethylene glycol, toluene diisocyanate, polyether polyols, butanediol

Greenville, Mississippi
Agricultural testing station

Jamesburg, New Jersey
Expandable polystyrene

Kearny, New Jersey
Expandable polystyrene

Parsippany, New Jersey
Administration

Port Edwards, Wisconsin
Chlorine, caustic soda

Santa Fe Springs, California
Cleaning and sanitizing products

Troy, Michigan
Urethane systems

Tucker, Georgia
Cleaning and sanitizing products

Washington, New Jersey
Polyether polyols

Wyandotte, Michigan
Chlorine, caustic soda, sodium bicarbonate, propylene oxide, polyether polyols, surfactants, cleaning and sanitizing products, transparent iron oxide pigments.

(RA 72).

24. BWC's butanediol (an intermediate for the production of plastics) plant located at Geismar, Louisiana, was put into operation in 1977. (RA 148). In 1978, BWC completed the construction of a Basagran herbicides plant at Geismar. (RA 149). Also in 1978, BWC [25]put into operation a plant for the manufacture of Vitamin E at Wyandotte, Michigan. (RA 150). On November 5, 1979, BWC began construction of a plant for the manufacture of diphenyl methane diisocyanate (MDI) at Geismar. (RA 152).

25. BWC had the following sales, earnings, assets, and capital expenditures for the years 1971–1977:

Million $	1971	1972	1973	1974	1975	1976	1977
Net Sales	268.8	315.4	378.3	517.4	589.8	710.0	
Earnings After Taxes	[***]	[***]	[***]	[***]	[***]	[***]	
Total Assets	254.8	281.4	300.3	354.6	437.1	530.6	
Fixed Assets	147.6	157.6	169.2	187.7	224.1	270.5	
Capital Expenditures	22.9	27.4	30.6	42.0	53.7	76.8	

(RA 70).

26. As of March 1979, BWC was organized into four groups: Industrial Chemicals Group, Colors and Intermediates Group, Polymers Group, and Chemicals Specialties Group. These four basic groups were further subdivided into divisions and departments, each with a progressively narrower scope of responsibility. (RA 73–74; 76–78).

27. BWC's Colors and Intermediates Group (formerly the Colors and Chemicals Group) consisted of three divisions, one of which was the Colors and Auxiliaries Divsion. (RA 74). The Colors and Auxiliaries Division was responsible for organic pigments, inorganic pigments, dyestuffs, and auxiliaries (RA 76), and was structured into six departments: Manufacturing, TCC (Textile Colors and Chemicals) Marketing, PIC (Pigments and Industrial Colors) Marketing, Whitestone Operations, Leather and Paper Dyes Marketing, and Business Strategies. (RA 77).

28. The PIC Department was responsible for organic pigments, inorganic pigments and dyes for all non-textile applications except leather and paper applications. (RA 78). It was headed by a Marketing Manager, who was responsible for the Sales Manager and **[26]**Technical Service Manager. (RA 79). The Sales Manager was directly responsible for the PIC sales force (RA 80); the Technical Service Manager was directly responsible for the PIC Department's technical service force. (RA 81). As of January 1978, the position of Technical Service Manager was abolished and the Sales Manager assumed responsibility for two newly created Industry Managers, one of whom handled printing inks customers and the other paints and coatings customers. Each of the industry managers assumed responsibility for both technical service and sales to their respective industry. (RA 82).

29. The names and positions of certain officers and employees of BASF/BWC for the relevant period are given hereinbelow:

Dieter Ambros: From April 20, 1971 to April 10, 1979, he was the President of BWC. During the same time period, he was a member of BWC's Board of Directors. (RA 83).

Dr. J.F. Kohnle: From 1970 to February 1981, he held the following positions with BWC and BASF:

Dates	Position	Code
10/79 - present[6]	Group Vice-President, Colors and Fine Chemicals Group, BWC	
1/1/76 - 10/79	Group Vice-President Colors and Intermediates Group, BWC	
10/1/72 - 11/3/75	Director, Strategic Planning and Five Year Planning, Zentralbereich Zentrale Planung, BASF AG	AZS
[27] 7/1/70 - 10/1/72	Group Leader, Strategic Planning, Zentralbereich Zentrale Planung, BASF AG	AZS

(RA 84).

James G. Brown: From November 1973 to March 1977, he was the General Manager, Colors and Auxiliaries Division, BWC. (RA 85). He was succeeded by Gunter Koenen. (RA 86).

Dr. Edwin Hahn: From 1968 to February 1981, he has held the following positions with BWC and BASF:

Dates	Position	Code
6/13/79 - present	General Manager, Dyestuff Laboratory BASF AG	WF
1/1/78 - 6/12/79	Director, Central Development, Sparte Pigments and Auxiliaries, BASF AG	CPOZ
3/1/74 - 12/31/77	Director, Central Development, Sparte Dyestuffs and Auxiliaries, BASF AG	CFE/ZE
1/70 - 1/74	General Manager, Colors and Auxiliaries Division, BWC	
1968 - 1/70	Director of Technical Relations, BASF Corporation	

(RA 87).

Dr. Uwe Soenksen: From 1971 to July 1979, he held the following positions at BWC and BASF: **[28]**

[6] In October 1979, BWC's Colors and Intermediates Group was reorganized and renamed the Colors and Fine Chemicals Group. As part of the reorganization, a new Pigments Division was created by combining the former Chemetron Pigments Division and the former PIC Department. (RA 75).

Dates	Position	Code
5/78 - 7/79	Venture Manager, Colors and Auxiliaries Division, BWC	
9/77 - 5/78	Manufacturing Manager, Colors and Auxiliaries Division, BWC	
2/74 - 9/77	Manufacturing Manager, Dyestuffs, Colors and Auxiliaries Division, BWC	
1971 - 2/74	Technical Coordination, Sparte North America BASF AG	UNT

(RA 88).

Dr. J. Dayan: From July 1974 to February 1981, he held the following positions:

Dates	Position
5/78 - present	Manufacturing Manager, Colors and Auxiliaries Division, BWC
9/77 - 5/78	Director, Group Technology, Colors and Intermediates Group, BWC
7/74 - 9/77	Assistant to General Manager/Manager, Planning and Administration, Colors and Intermediates Group, BWC

(RA 89). **[29]**

Ted Smock: From 1971 to March 1978, he held the following positions:

Dates	Position
1971 - 9/76	Marketing Manager, PIC Department, BWC
9/76 - 3/78	Director, National Pigments Accounts, PIC Department, BWC

(RA 90).

Eli Aschner: From September 1976 to January 1980, he was the Marketing Manager, PIC Department, BWC. (RA 91).

J. O'Grady: From 1965 to 1977, he was the Sales Manager, PIC Department, BWC. (RA 92).

Gunter Kirchmer: From 1971 to August 1, 1980, he held the following positions at BWC and BASF:

Dates	Position	Code
1/1/79 - 8/1/80	Leader, Market Opening Group, Pigments and Dyestuffs, Technical Services - "Sonder F" Subdepartment, Sparte Pigments and Auxiliaries, BASF AG	CPE/SF3
1/1/78 - 12/31/78	Market Service - Paints, Technical Services - "Sonder F" Subdepartment, Sparte Pigments and Auxiliaries, BASF AG	CPE/SF4
[30] 6/75 - 1/1/78	Market Service - Paints, Technical Services - "Sonder F" Subdepartment, Sparte Dyestuffs and Auxiliaries, BASF AG	CFE/SF4
1971 - 6/75	Technical Service Manager, PIC Department, BWC	

(RA 93).

Horst Bender: From 1970 to January 1978, he held the following positions at BWC and BASF:

Dates	Position	Code
1/1/77 - 3/1/78	Sales Manager, PIC Department, BWC	
8/1/75 - 8/1/77	Technical Service Manager, PIC Department, BWC	
1/1/72 - 8/1/75	Senior Technical Advisor, Printing Inks, PIC Department, BWC	
1/1/70 - 12/31/72	Market Service - Printing Inks, Technical Service - "Sonder F" Subdepartment, Sparte Dyestuffs and Auxiliaries, BASF AG	CFE/SF3

(RA 94).

C. *Chemetron Pigments Division ("CPD") And Its Business*

30. Chemetron Corporation was a corporation organized under the laws of the State of Delaware, with its principal place of business [31]located at 111 E. Wacker Drive, Chicago, Illinois. (Comp. 7; Ans.

7). It was a wholly-owned subsidiary of Allegheny Ludlum Industries, Inc. (presently, Allegheny International), a corporation organized under the laws of the State of Pennsylvania, with its principal place of business at 2700 Two Oliver Plaza, Pittsburgh, Pennsylvania. (Comp. 8; Ans. 8).

31. Prior to its acquisition by BWC, the Chemetron Pigments Division ("CPD") was an unincorporated division of Chemetron Corporation engaged in the manufacture and sale of organic pigments throughout the United States. (Comp. 9; Ans. 9)

32. Prior to 1964, Chemetron Corporation conducted its organic pigments business through Holland Color and Chemical Company of Holland, Michigan. (RA 112). In 1964, Chemetron Corporation acquired Standard Ultramarine and Color Co. of Huntington, West Virginia, and combined it with Holland Color and Chemical to form the Holland-Suco Color Co. as a subsidiary. (RA 113). In 1968, the Holland-Suco Color Co. was renamed the Pigments Division, Chemetron Corporation. (RA 114).

33. At the time of the acquisition, CPD manufactured organic pigments at two locations in the United States: Holland, Michigan and Huntington, West Virginia. (RA 110–11; CX 1907Q).

34. The name and positions of certain CPD officers and employees during the relevant period are given hereinbelow:

Jerome E. Counihan: From December 1973 to March 1979, he was the President of CPD. (RA 95).

W. R. Wickline: From November 1974 to March 1979, he held the following positions:

Dates	Position
5/77 - 3/79	Vice President, Marketing and Sales, CPD
3/76 - 5/77	Director, Marketing and Sales, CPD
11/74 - 3/76	General Sales Manager, CPD [32]

(RA 97). As Vice-President - Marketing and Sales, Mr. Wickline was responsible for the Marketing Research, Marketing, and Sales Departments of CPD. (RA 98; CX 2005F).

Richard L. Alsager: From December 1974 to March 1979, he was CPD's Marketing Research Manager. (RA 101).

P.E. Malik: From December 1976 to March 1979, he was a Marketing Research Analyst for CPD and reported to Mr. Alsager. (RA 102; CX 2005G).

T.W. Rogers: As of June 1978, he was Manager of CPD's Sales

Department which included three regional sales managers, 14 salesmen and one sales trainee. (RA 104; CX 2005I).

A.A. Egloff: As of March 1979, he was Manager of CPD's Marketing Department which included, *inter alia,* one technical service representative for solvent inks and another for coatings. (RA 103; CX 2005H).

Dr. S.P. Malchick: From October 1973 to March 1979, he held the following positions with CPD:

Dates	Position
10/73 - 2/77	Director of Research
2/77 - 3/79	Director of Technology

(RA 105). As the Director of Technology, Dr. Malchick was responsible for four departments: Research - Pigments and Chemicals; Research - Dispersions and Vehicles; Technical Service - Graphic Arts; and Technical Service - Coatings and Plastics. (RA 106; CX 2005Q-R, Y, EE, FF). The Research - Pigments and Chemicals Department consisted of the following research groups: azo reds; analytical services; pigments and intermediates process; phthalos; azo yellows; and high performance pigments. (RA 107).

Charles S. Long: From July 1975 to March 1979, he was CPD's Director of Engineering. (RA 109). **[33]**

D. *The Acquisition And Its Background*

35. In 1978, Allegheny Ludlum Industries (ALI) attempted to sell the assets of CPD to Rhinechem Corporation ("Rhinechem"), a subsidiary of Bayer AG ("Bayer"), a West German corporation. (CC's Factual Admissions, ¶ 44). A written agreement concerning the proposed sale of CPD to Rhinechem was entered into by ALI and Rhinechem on August 25, 1978. (BWC's Factual Admissions, ¶ 124). Among the unsuccessful bidders were BASF/BWC, Dainippon, and Sandoz. (Sweeney 7331–32). Upon application by the Federal Trade Commission, the United States District Court for the Northern District of Illinois, on October 20, 1978, issued an order preliminarily enjoining that sale and acquisition. (CC's Factual Admissions, ¶ 45). *See FTC v. Rhinechem Corporation,* 459 F. Supp. 785 (N.D. Ill. 1978).

36. In one of the proposed findings in support of the requested injunction submitted by the Commission's Chicago Regional Office to the District Court in the *Rhinechem* proceeding, it was stated that BWC would be among the more acceptable purchasers of CPD than Rhinechem. (Sweeney 7374–75).

37. Mr. Clayton A. Sweeney, then Senior Vice-President of ALI, met with complaint counsel after the injunction against the Rhinechem sale had been entered and described the nature of the three

serious potential purchasers in the bidding for CPD. (Sweeney 7380). Mr. Sweeney met again with complaint counsel before he signed a tentative agreement with BWC in November 1978. (Sweeney 7380–84).

38. Mr. Sweeney testified that he knew that complaint counsel had recommended to the Commission that a preliminary injunction application be authorized with respect to BWC's acquisition of CPD. On March 19, 1979, there was a meeting among Mr. Sweeney of ALI, complaint counsel and certain Federal Trade Commissioners and some of their staff. (Sweeney 7387–88). Subsequently, the Commission did not authorize an application for preliminary injunction against the acquisition. (Sweeney 7388–89).

39. On November 17, 1978, ALI, Chemetron Corporation, and BWC executed a purchase agreement. (RA 127). The acquisition of CPD by BWC was consummated on March 23, 1979. (RA 128). On April 5, 1979, an administrative complaint was issued in this proceeding. [34]

II. THE PRODUCT MARKET

A. *Colorants—Organic Pigments, Inorganic Pigments, And Dyes*

40. Colorants (agents used to impart color to materials) are generally classified into three groups: organic pigments, inorganic pigments and dyes. (CX 3102B, E; Malchick 2875–76). Organic pigments provide much of the color in printing inks, coatings (which include automotive paints, house paints and industrial paints), and plastics. Smaller areas of consumption include textiles and paper. (Schober 1646; Papillo 1785; Whittemore 1926; Malchick 2876). Dyestuffs and inorganic pigments are also used to impart color in various applications. (Smith 1301–04, 1348–49; Malchick 2875–76).

41. Pigments are particulate solids which are used as colorants. Organic pigments are carbon compounds. Inorganic pigments are not carbon compounds. Pigments are usually incorporated or dispersed in a vehicle or substrate for application to the material to be colored. A pigment is normally insoluble in the vehicle or substrate and remains a solid particle throughout the coloration process. (CX 1951F; 2047G; 3102A–C; 3987A; Smith 1321–22, 1585–86). The raw materials used to produce organic pigments are different from those used to produce inorganic pigments. Organic pigments are derivatives of petroleum or coal tar. (CX 2042W; 3101M; Smith 1467, 1585–86; Papillo 1802–03).

42. Dyes are organic chemicals. Unlike pigments, however, dyes are soluble compounds for which fibers have an affinity. (CX 1903B;

1951F; Smith 1304). Because of their different physical and chemical characteristics, pigments and dyes are applied differently in the coloration process. (CX 1951F; 3102C).

43. Organic pigments are classified by the ITC as "lakes" or "toners." (CX 16G; 3102N). A lake is an organic pigment which has been combined with an inorganic material (such as light alumina hydrate). A toner does not contain any inorganic material. (Smith 1314–15A). Historically, more organic pigments used to be sold in lake form than today. In 1978, organic pigment lakes represented less than 2% of total organic pigment production reported to the ITC. (CX 3987E).

44. Organic pigments may be divided into different classes on the basis of their chemistry as follows: azo pigments, condensation pigments, vat pigments, and polycyclic pigments. (Smith 1306–07). *See* CX 3102R. Azo pigments cover a wide variety of colors and pigment types. (Smith 1328, 1359). Polycyclic pigments include carbazole violets, flavanthrone yellows, indanthrone blues, phthalocyanines and quinacridones. (Smith 1354). Organic pigments may also be grouped by their color or shade. (Glassman 8465, 8475). [35]

45. The *Colour Index,* a standard reference book used by the pigments industry, categorizes and lists pigments according to their shade and chemical type. Each pigment is defined by a *Colour Index* name ("C.I. name") and a *Colour Index* chemical constitution number ("C.I. number"). (CX 3102D; Smith 1304, 1306). A *Colour Index* name is often variously abbreviated (*e.g.,* Pigment Blue 15 as P.B. 15, Blue 15, or B–15). (CX 1801K–O; 3102W).

46. Some of the families of organic pigments and their corresponding *Colour Index* designations are as follows (CX 3101D–F is the basic source; additional sources are noted):

Pigment Name	**C.I. Name**
Alkali Blue (CX 779F)	Pigment Blue 19 or 61
Anthrapyrimidine (CX 1702F)	Pigment Yellow 108
Azomethines	Pigment Yellow 129
Benzimidazolones	Pigment Yellow 120
	Pigment Red 175, 176, 183, 185, 208
	Pigment Violet 32
	Pigment Brown 25
BON Maroon	Pigment Red 63
BON Reds	Pigment Red 52 (calcium)
(CX 16K)	Pigment Red 52:2 (manganese)
Carbazole Violet	Pigment Violet 23

Pigment Name	C.I. Name
Diarylide Yellows & Oranges	Pigment Yellow 12, 13, 14, 15, 16, 17, 55, 83
	Pigment Orange 14, 15, 16
Dinitraniline Orange	Pigment Orange 5
Disazo Condensations	Pigment Yellow 93, 94, 95
	Pigment Orange 31
	Pigment Red 144, 166
	Pigment Brown 23
Flavanthrone Yellow	Pigment Yellow 112 [36]
Hansa Yellows	Pigment Yellow 1, 3, 4, 5, 10, 60, 73, 74, 75, 78, 85, 97
	Pigment Orange 1
Indanthrone Blues	Pigment Blue 21 and 22
Isoindoline (CX 1702H)	Pigment Yellow 139
Isoindolinones	Pigment Yellow 109, 110
	Pigment Red 180
Lithol Reds (CX 16K)	Pigment Red 49 (sodium)
	Pigment Red 49:1 (barium)
	Pigment Red 49:2 (calcium)
Lithol Rubines (CX 1702B)	Pigment Red 57 or 57:1
Naphthol Reds (CX 3102W)	Pigment Red 17, 22, 23
Methyl Violet (CX 779D)	Pigment Violet 3
Nickel Azo Yellow	Pigment Green 10
Para Red	Pigment 1
(Permanent) Red 2B (CX 16K; 3102X)	Pigment Red 48:1 (barium)
	Pigment Red 48:2 (calcium)
Perylenes	Pigment Red 123, 149, 179, 190
Pigment Scarlet	Pigment Red 60
PhthalocyanineBlues (CX 16L; 1702H)	Pigment Blue 15, 15:1, 15:2, 15:3, 15:4, 16
PhthalocyanineGreens	Pigment Green 7, 36
Pyrazolones	Pigment Yellow 10
	Pigment Orange 13, 34
	Pigment Red 37, 38, 41, 42
Quinacridones	Pigment Orange 47, 48, 49
	Pigment Red 122, 192, 206, 207, 209
	Pigment Violet 19, 42 [37]
Quinophthalones	Pigment Yellow 138, 143
Red Lake C	Pigment Red 53
Rhodamines (Basic Dye Complexes) (CX 779F)	Pigment Red 81
	Pigment Violet 1

Pigment Name	C.I. Name
Toluidine Red	Pigment Red 3

47. Examples of azo pigments are hansa yellows, diarylide yellows, dinitraniline orange, pyrazolones, red lake C, BON red, lithol red, permanent red 2B, lithol rubine, and napthol red pigments. (CX 3101M; 3102R, Z). Examples of polycyclic pigments are phthalocyanines ("phthols"), quinacridones, carbazole violet, flavanthrone yellow, indanthrone blue, and perylenes. (CX 3102R, V; Smith 1354).

48. The crystalline structure of a commercial phthalocyanine blue pigment is either alpha- or beta-phase. (CX 3102CC). The alpha-form phthalo blues (or alpha blues), which are green-shade (GS) blues, are Pigment Blue 15 (also sometimes referred to as Pigment Blue 15:0), Pigment Blue 15:1 and Pigment Blue 15:2. The beta-form phthalo blues (or beta blues), which are red-shade (RS) blues, are Pigment Blue 15:3 and Pigment Blue 15:4. (CX 16L; 114F; 1839R). There is also a metal-free (no copper atom) phthalo blue, which is Pigment Blue 16. (CX 144F). Phthalo green pigments come in two shades, a blue-shade (BS) and a yellow-shade (YS), which are Pigment Green 7 and Pigment 36, respectively. (CX 114G; 1839R). Phthalocyanines are sometimes referred to as copper phthalocyanines (CPC) or as "PCN." (CX 200C; 204A, H; 3202C).

B. *The Production Process Of Organic Pigments*

49. Organic pigments are synthesized from chemical constituents in a process that is generally similar for all organic pigments. The raw materials which are used to produce organic pigments are precursor chemicals known as "intermediates." (Smith 1317). Major intermediates used in the production of azo yellows are dichlorobenzidine (DCB), MNPT, and arylides (AAA, AAOA, AAMX, and AAOT). (CX 2022; 3101M; 3946VVV; Smith 1325). For azo reds, the main intermediates are C-Amine, beta naphthol, BON acid (BONA), tobias acid, 2B-acid, and 4B-acid. (CX 2042W; 3101M; 3946UUU). These intermediates are in turn based upon the following derivatives of petroleum or coal tar: benzene, toluene, xylene, ethylene, and naphthalene. (CX 2042W; 3101M; Smith 1467). All organic pigments are in some way derived from one or more of these five basic building blocks, which are all compounds of carbon. (Smith 1585–86). [38]

50. The production process of organic pigments may be divided into two separate phases; pigment synthesis and "finishing". Synthesis is the formation of the organic pigment molecule by a chemical reaction of the component parts of raw materials. Finishing (also known as "conditioning"), usually involves the physical modification

of a pigment to give it desirable end-use properties. Finishing includes surface treatment of pigment particles, alteration of particle size, and alteration of particle distribution. (CX 3102AA–BB; Smith 1322–23; Malchick 2993–95). Synthesis and finishing are not always clearly separable. For example, for many azo pigments, synthesis yields products in pigmentary form. (CX 3102BB–CC). Most pigments require a separate finishing step. (Smith 1324).

51. Organic pigments are synthesized in a reaction vessel, in which pigment intermediates and other reaction ingredients are combined under carefully controlled conditions, such as temperature, pH level, and concentration of reactants. After synthesis is complete, various finishing steps may be applied. The pigment slurry is then filtered and pumped to a filter press, where it is washed with water to remove impurities. The resulting product is pigment "presscake," a water-wet pigment paste containing about 60–80% water. [***]

52. These vessels can be used for production of some inorganic pigments, such as iron blue and chrome yellow, as well as for production of organic pigments. [***]

53. Presscake can either be sold as is, or it can be used to produce dry colors or dispersions. (CX 3102BB; [***]. If used for dry colors, the presscake is dried in ovenlike units for specified times, and then the pigment is pulverized by grinding. [***] Each batch of dry color is typically blended with other batches to control the color of the products to be sold. [***] Dry color can be sold as is, or dispersed with other materials. When dispersed, it usually is combined with a liquid and then used by the coatings or inks industry. If it is dispersed with dry materials, it is normally used in plastics or rubber applications. [***]

54. The production process for polycyclic pigments is somewhat longer than the process for production of, for example, simple azo pigments. [***] Polycyclic pigments generally require some additional equipment compared to azo pigments, such as explosion-proof vessels and buildings in which to conduct the synthesis. [***]

55. The initial synthesis of quinacridones, phthalos, flavanthrones, indanthrones and carbazole violet creates a "crude" material which is still an intermediate. This crude must be properly **[39]** prepared for finishing. This step may involve a kind of grinding; in the case of these pigments, "salt-grinding" is a process very commonly used in the United States. [***]

56. Following salt-grinding, these pigments are finished in much the same way as other organic pigments are finished. [***] testified that these steps—the filtration of the pigment from the slurry

created from the crude material, and the drying and pulverizing of the pigment to produce a dry color—are "areas of commonality" between polycyclic pigments and other organic pigments. [***]

57. Production equipment for pigments like carbazole violet, flavanthrone yellows, indanthrone blues, phthalos and quinacridones is very similar. The equipment can be, and has been, used interchangeably. [***] uses the same equipment to produce both phthalocyanines and carbazole violets. Asked if switching production of one pigment to the other was common, he said: "We can and we do." [***]

58. [***] testified that [***] "routinely" uses the same equipment to produce phthalo blue and carbazole violet, cleaning the equipment between each use. [***] He testified that [***] has produced quincridones in the same reactor it has used to produce phthalos. [***] He also testified that [***] has used the same equipment to finish both phthalocyanines and flavanthrone yellows, again cleaning the equipment thoroughly between each use. [***]

59. [***] are produced with a vessel for the initial synthesis, a vessel for washing, a grinder, additional tanks for washing, and "filterpresses" (devices used to squeeze much of the water out of the pigment following the washing and leave it in more easily manageable "presscake" form, which may be sold commercially or finished in other ways). [***]

60. The equipment for azo pigments is similar to that for polycyclic pigments after the stage at which the crude intermediate is ground. In fact, much of this equipment is interchangeable. **[40]** [***]

61. A major obstacle to such interchange is the need to clean equipment used to produce, for example, a red pigment before it is used for a yellow pigment, and the possibility of contamination of the pigment if the equipment has not been thoroughly cleaned. [***] Another factor is the economic cost associated with it. In addition to the labor costs of cleaning, the lost production time during cleaning is a cost that must be considered. (Malchick 3176–77). [***] However, because of contamination problems, the equipment may sometimes be "dedicated" to one pigment despite the fact that the equipment could otherwise be used to produce other types of pigments. [***]

62. There are some differences among the production processes used for various organic pigments. Some azo pigments (*e.g.,* Pigment Yellow 12) do not necessarily have a finishing step between synthesis and filtration. (CX 3101O; 3102BB; [***]). The type of vessel and medium in which synthesis takes place may also be different. [***] are produced in aqueous solutions in unpressurized vessels known as

"coupling tanks" (or "strike tanks"), whereas the synthesis of [***] is a solvent-based process done in a "reactor" which is sometimes pressurized. [***]

C. *The Physical And Functional Characteristics Of Organic Pigments and Pigment Products And Their Uses*

63. The physical properties of an organic pigment determine the pigments end use application. (Smith 1312–13). These properties include: shade, color strength, cleanliness, transparency, lightfastness, chemical fastness, heat fastness, bleed resistance, dispersibility, and rheology. The quality of a pigment is essentially determined by its value-in-use. (CX 3102K).

64. The shade of a pigment is its color as perceived by a viewer. (Smith 1311). Color strength (also known as tinctorial strength) refers to the coloring power of a pigment. The cleaniness refers to the pigment's degree of color; it is the opposite of dirtiness of color. (Smith 1312).

65. Transparency is a property which is important in the production of process printing inks and metallic automotive coatings. An ink made with a transparent pigment will allow the **[41]** color of an underlying ink to show through (and combine with) the color of an overlying ink, thereby producing a multi-color image. (Smith 1310). Pigment transparency is necessary in a metallic car coating so that the aluminum flakes in the coating can reflect the pigment color which overlies them. (Panush 2204).

66. Lightfastness, chemical fastness, heat fastness, and bleed resistance concern an organic pigment's ability to resist the degrading effects of sunlight, chemicals, heat, and solvents. A pigment which is lightfast will not fade or darken under exposure to sunlight. Similarly, a chemically-resistant pigment is unaffected by sulphur dioxide and other chemicals. Resistance to sunlight and chemicals are important properties of pigments used in coatings, particularly automotive coatings. (Smith 1309; Panush 2232–36). Heat resistant organic pigments are required in the coloration of plastics because of the latter's high processing temperatures. (Smith 1309–10). Bleed resistance, or solvent resistance, is the ability of a pigment to remain completely insoluble in solvents. (Smith 1311).

67. Dispersibility concerns the ease with which organic pigment particles are incorporated in the vehicle or substrate in which they are applied. (CX 966B; Panush 2216–19).

68. The rheology of a pigment is measured by its properties of flow (fluidity). Floculation refers to the tendency of some pigment particles to aglomerate in a vehicle to form blotches. Rheology is an

important attribute of a pigment used in printing inks. (CX 3102K; Smith 1307–10).

69. "Value-in-use" refers to the relationship between a pigment's price and its tinctorial strength. Thus, a blue pigment priced at $4.00 per pound which was twice the tinctorial strength of a $3.00 blue pigment, has a lower "cost" than the $3.00 pigment. In other words, the "money value" of the $4.00 pigment would be higher. (CX 3102K; 3202D; Aschner 5411–12; McKenzie 6920).

70. "High-performance" refers to an organic pigment's physical properties. High-performance pigments are those which have excellent end-use properties (such as fastness to light, chemicals, etc.) and which can be used in demanding applications (such as automotive coatings and synthetic fibers). (Smith 1318–19, 1370–71; Panush 2242–43). High-performance organic pigments include phthalocyanine blues and greens, isoindolines, isoindolinones, anthrapyrimidine, flavanthrone, perylenes, quinacridones, indanthrone blue (also known as indanthrene blue or indo blue), carbazole dioxazine, benzimidazolones, asomethines, and quinophthalones. (CX 3101F; Panush 2241–42). **[42]**

71. Organic pigments are sold in a wide variety of wet and dry product forms, including presscake, dry color, and dispersions. (CX 3101J–K; Smith 1315). Presscakes are water-wet granules of organic pigment which are obtained in the manufacturing process before drying. (Smith 1315; Malchick 3008). Presscake contains 60–80% water and can be dried and pulverized to produce dry colors. (Malchick 3009–10). Either presscake or dry color can be used to produce an organic pigment dispersion, a value-added product with pigment content of at least 20%.

72. The most common dispersions made from presscake are "flushed colors." (CX 3102BB; 3418D). In the flushing process, the water content of the presscake is replaced ("flushed" away) by an oil-based liquid known as "vehicle" or "varnish." [***]

73. Along with dry colors and presscake, flushed color is one of the three most common commercial forms of organic pigments used today. (Malchick 3008).

74. The equipment required for one production line for flushed colors [***] costs approximately $500,000. Because of the danger of color contamination, separate production lines are used for blue, red, and yellow flushed colors. [***]

75. Hilton-Davis introduced flushed colors to the printing ink industry. In the late 1940s and early 1950s, Holland Color (Chemetron's predecessor) and Federal Color (Sun's predecessor) entered the flushed color business, at first selling to small ink makers and

eventually selling to the very large ink makers. Most U.S. manufacturers of oil inks today use flushed colors. (CX 2012B; Counihan 5525–28).

76. Flushed colors compete with other forms of pigment products for use in various applications. Flushed colors achieved their substantial role in the printing ink industry through direct competition against dry colors (Counihan 5685–87), and flushed colors are currently marketed by salesmen who emphasize advantages of flushed color over dry products. (Weissglass 2514–15). Flushed colors also compete with dry products in coatings applications. (Counihan dep. CX 5087NN–OO). **[43]**

77. Presscake and easily dispersing (ED) dry pigments have mounted a counterattack against flushed colors. (Geiss 10,723–24). The easily dispersing (ED) pigments in particular are viewed as a threat to flushed colors. (CX 1958G–H; 2047E; Malchick 3297–98, 3299). [***] promoted easily dispersible pigments against flushed colors. (CX 204B, V; Aschner 5473–74). The competition between flushed colors and other product forms is expected to intensify (CX 1958G–H) as a result of the research and development efforts of companies [***] (Geiss 10,723–24; Bock dep. CX 5085CC; Hahn dep. CX 5089B–E).

78. Organic pigments are used to impart color to a variety of products, including printing inks, coatings (paints), plastics, rubber, textiles, carbon paper, and artist supplies. (CX 1951B; 3307D; 3987A; Malchick 2876–80). The major users of organic pigments are the printing ink, coatings, and plastics industries, which together account for about 95% of all organic pigment consumption. Printing inks are the largest users of organic pigments (about 55% of total consumption), with coatings (25%) and plastics (15%) as the next largest users. (CX 1839; 1951B–F; 1958J; 3307D; Whittemore 1930–31).

79. Some organic pigments are predominantly used in one end use application. Most diarylide yellow pigments, for example, are consumed by the printing ink industry. (Aschner 5359). Usually, the same organic pigment can be sold to a variety of end users. (Smith 1369–70). Thus, diarylide yellows can be used in coatings, plastics, and textiles as well as in inks. (Smith 1367). Phthalocyanine pigments can be used in virtually all applications. (CX 114D; 3801E–F). Product catalogues distributed by organic pigment companies also indicate that a particular organic pigment is often suitable for a range of end-use applications (CX 114D–J; 4018).

80. Each end-use has its own technical and performance needs in connection with its use of organic pigments. (Schober 1646; Panush

2240–44; Malchick 2876–80; Aschner 5390–91). In discussing product development, [***] with responsibility for organic pigments sales, emphasized the importance of "application testing" in which a pigment product is tested in each of the end use applications in order to alter or tailor the pigment's properties to suit the particular technologies and requirements of the end use industry. [***]

81. Marketing of organic pigments is generally end-use oriented. Producers typically have part of their sales force specialize in serving one of the three major end use industries, printing inks, coatings and plastics. Salesmen generally have an extensive background in one or more of the end uses, and rely on [44]other sales and technical personnel in connection with other end uses. (Papillo 1871; Alsager 3575–84; Parker 4945). Some organic pigments producers also divide their technical service staff along end-use industry lines (Alsager 3723–24).

82. Many pigment producers have become rather specialized, with product lines geared primarily to one or two end-uses. For example, Apollo and Magruder Color cater primarily to the printing ink business, while DuPont and Rhinechem cater primarily to the coatings industry. CPD, before its acquisition by BWC, catered primarily to the printing inks and coatings business. Even among those companies which are not specialized, the focus within the company is on different end-uses. [***]

83. There are four major printing processes used today in Europe and the United States: letterpress, offset (lithographic), flexographic, and gravure. (CX 1951B–E; Stammen 2380; Whittemore 1926–29).

84. Letterpress printing uses plates that have raised surfaces. The ink is put on the raised surface, which is pressed against paper to print an image. Letterpress printing, used for newspapers and some magazines, comprises about 15% of all printing and is decreasing in popularity. (CX 1951C; Whittemore 1926–27; Stammen 2382–83).

85. Offset printing, also known as lithographic printing, is used to print newspapers, magazines, and books. About 40% of all printing is done with the offset process, which has several steps. First, a solution (known as "fountain solution") covers the parts of a plate cylinder that are not to be printed. The plate cylinder then comes in contact with ink rollers, which put ink on the parts of the plate cylinder that are not covered with the fountain solution. Next, the inked cylinder prints onto an offset "blanket," a cylinder which transfers the ink to paper on an impression cylinder. Offset printing is done either on individual sheets of paper (sheet-fed) or on a

continuous web of paper (web offset). (CX 1951C–D; Whittemore 1927–28; Stammen 2382).

86. Flexographic printing, like offset printing, uses a transfer cylinder. The printing is done on flexible artificial substances (such as polyethylene) used in packaging. Flexographic printing represents about 20% of all printing. (CX 1951C–D; Stammen 2383–85).

87. Gravure printing, which accounts for about 25% of printing, is divided between publication gravure (used to print magazines, catalogues, and newspaper supplements) and packaging gravure (used to print cartons for products like food and cigarettes). The gravure process is basically the opposite of letterpress. A gravure cylinder has small, engraved cells of varying depths, in contrast to the raised surface on a letterpress cylinder. After the gravure cylinder **[45]**is rotated in ink, a "doctor blade" removes the ink from the cylinder's surface but leaves the ink which is in the small cells. This remaining ink is then transferred onto the print medium. (Whittemore 1928; Stammen 2385–86).

88. Four-color process printing is used to reproduce color photographs on a printing press by overlaying one color on top of another. Layers of yellow, red, blue, and black ink are printed, and the different layers combine to form a multi-color image. Process printing can be used in any printing process (offset, gravure, etc.). (Smith 1310; Stammen 2458; Malchick 2962).

89. Different types of inks are used by the letterpress, offset, flexographic, and gravure printing processes. Oil inks (also known as paste inks) are viscous, oleoresinous inks that are used in letterpress and offset printing. Virtually all flushed colors are used in oil inks. Fluid inks (also known as liquid inks), on the other hand, are thin, water- or solvent-based inks used in either the flexographic or gravure process. Fluid inks use mostly dry color, as well a some presscakes. (Whittemore 1926, 1930).

90. Approximately 60–65% of ink pigments are incorporated in oil inks, with the remaining 35–40% going into fluid inks. The use of fluid inks is growing rapidly and at a faster rate than oil inks. (Whittemore 1931–32). The growth of fluid inks is due to the increased attractiveness of gravure printing, which in comparison to other printing processes produces higher quality and is more economical in long production runs. (Stammen 2387–99; Whittemore 1932).

91. The coatings industry uses organic pigments in exterior and interior house paints (known as architectural coatings or trade sales paints), automotive coatings, and other industrial coatings. (CX 723QQQ; 3801O–P). Architectural coatings or trade sales paints

comprise more than one-half of all coatings. (CX 1839T). In the coatings business, there has been a shift from solvent-based systems to water-based (aqueous) systems because the latter are safer, more convenient, and more practical. (CX 3307E–F; Aschner 5437–38). The coatings industry uses organic pigments primarily in dry-toner form. (CX 1951F).

92. Coatings and plastics producers place a high value on obtaining a particular color in the product. Stability and lightfastness are also important considerations in the coatings end-use. (Smith 1308–10; Panush 2226–27). Furthermore, organic pigments used in automotive coatings are generally difficult to disperse in the medium in which they are used, and may have less desirable rheology or flow characteristics. (Panush 2205).

93. In the automotive coatings area, in which the aesthetic appeal of a particular shade is important to the automaker, the **[46]** number of shades required is large and the cost of the pigment relative to the cost of the automobile negligible. (Papillo 1881). [***] testified that "Price is not the consideration in development of an automotive color." [***]

94. Several witnesses testified about color popularity and its impact on the automotive coatings end-use. Erhard R. Schober, Director of Marketing for Mobay Chemical Corporation's Pigments Division, the successor to Harmon Colors Corporation (a subsidiary of Rhinechem Corporation), called by complaint counsel as a witness, stated that, even when exposure tests show a given pigment is technically suitable for the coatings end-use, the end-user may not actually use that pigment until the particular shade becomes "fashionable." (Tr. 1651–52). Mr. Panush explained that it is very important in the automotive coatings business to anticipate fashion and styling changes in order to be able to have the appropriate pigments on hand to create the colors desired by the public. He stated that it is necessary for a supplier of automotive coatings to be prepared with a wide range of colors to satisfy the customers' needs. (Tr. 2264–67).

95. Durability is also a very important consideration in the automotive coatings area, and lengthy exposure tests of each prospective pigment are conducted. (Alsager 3637; Hahn 4098). Such tests are conducted at sites in Florida and Arizona for periods of esposure to the sun and the elements ranging from twelve months to more than two years. The exposed test panels are compared with the unexposed panels to determine how much shade, hue and/or strength has been lost. (Schober 1650–52; Papillo 1793–95; Panush 2208, 2220–36).

96. In plastics, heatfastness is often the characteristic most important to producers because of the thermal processes used for their products. (Smith 1310; Geiss 2078).

97. [***] identified Sun's end-use industry customers for organic pigments as paint, printing ink, plastic, textile, cosmetic. [***] **[47]**

D. *Phthalocyanine Pigments*

98. Phthalocyanine(or "phthalo") pigments are produced from phthalocyanine blue crude, an intermediate product. (CX 1839R; 3604P). Phthalo blue crude is produced (1) by combining phthalic anhydride, urea and copper chloride or (2) combining phthalodinitrile and copper chloride [***] (CX 654C).

99. Phthalo blue crude can be finished to produce phthalo blue pigments by several techniques. [***]

100. Phthalo blue crude is also "finished" to produce phthalo green pigments. (CX 1839R; 3216P). Phthalocyaninemolecules, which are present in blue crude, have 16 hydrogen atoms that can be replaced by halogens, such as chlorine and bromine. [***]

101. Although the finishing of phthalo crude does not change the chemical structure of the phthalo molecule, the finishing process is necessary to convert the crude into a pigment with tinctorial strength and other desirable end-use properties. (Smith 1338).

102. Phthalo pigments are the most important blue and green organic pigments. (CX 3216H; 3604N; 3846GGGG). Phthalo pigments account for about 80% of blue and green pigments used in this country and about 20% of all organic pigments used in the United States. (CX 602O; 654C).

103. The prices of phthalo pigments are moderate and fall in about the middle of the range of prices of all organic pigments. (CX 1251, 3708). Prices of organic pigments vary from about $3 or $4 **[48]** per pound to $30 or $40 per pound. Phthalo pigment prices range from $4 to $8 per pound. (Stammen 2416; McKenzie 6918; Glassman 8517–19).

104. Phthalo pigments are high-performance pigments, have many desirable performance characteristics and wide end-use applications, including printing inks, coatings, plastics and textiles. Combined with their versatility and moderate prices, phthalo pigments are considered the "workhorses" of the organic pigments industry. (CX 203F; 3202D; 3418T; 3801F; Smith 1371–72; Aschner 5366; McKenzie 6940–42), and they are sold in a wider variety of product forms than other organic pigments. (CX 3418T).

105. When phthalocyanine pigments were introduced in the 1930's, they set new standards for organic pigments. (CX 602O; 1951J; 3604E, L). Their performance properties make them the most

problem-free organic pigments available. (CX 3418T; 3603C). Phthalo blues and greens have outstanding lightfastness, heat stability, and chemical resistance—a combination of properties not matched by other blue and green pigments. (CX 3219C).

106. In the demanding use of automotive coatings, phthalos can produce colors ranging from green-shade blue through yellow-shade green, a range not matched by other organic pigments. (Panush 2273, 2275–76). Phthalos also have high tinctorial strength and excellent transparency and are regarded as "indispensable" to automotive coatings business, along with three other organic pigments: perylenes, quinacridones and benzimidazolones. (CX 3603C; Panush 2279–81, 2342–43).

107. Phthalocyaninepigments have dominated the blue/green sector of the organic pigment industry because of their high value-in-use—*i.e.,* the combination of their high-performance properties and moderate price. (CX 654B–C; 3202D). Their cost-effectiveness in certain applications puts phthalos "in a class by themselves." (Canon 12, 541).

108. Reflecting the importance of phthalo blues and greens in the fields of blue/green organic pigments, many planning and marketing documents of the leading sellers of phthalo pigments contain references to a "phthalocyanine market." [***] (CX 241FF; 3104G; 3202O; 3216Y; 3225I; 3418S–U; 3420E).

109. Reflecting the predominant position phthalo pigments occupy in [***] organic pigment business, [***] appears to pay special attention to the phthalo business. For example, [***] divides its organic pigments business into three product groups (phthalocyanines, quinacridones, and other organic pigments), and divides its organic pigment research and development in the same fashion. (CX 3224B–D; 3232D; 3233B; 3234D). [***] **[49]**[***]

110. A number of BWC's documents also have referred to a "phthalocyanine market." (CX 602O–S; 618A; 1204B). Some of them discussed the size of the phthalo "market" and the shares of BWC and its top competitors within that "market." (CX 215K; 221U–MM; 227AA; 1013F–H; 1841A; 1842L). This type of analysis appeared in planning or strategy documents which examined BWC's position both in the overall organic pigments market and in the phthalo segment. (CX 212; 241FF). For example, [***] a major planning document, analyzed the phthalo market and gave "phthalocyanine market share projections" [***] (CX 212U). This analysis was similar to that done for the all organic pigments market. (CX 212Y–AA).

111. Phthalocyaninepigments were of strategic importance to BWC. (CX 702G; CPF 439; 508–10; 518–19; 536–37). The 1976 Annual

Technical Report, which reviewed the status of BWC's PIC Department, analyzed the organic pigment market (CX 723E–V) and referred to BWC's "phthalocyanine strategy." (CX 723W–CC). Through increased sales efforts, supported by technical and research and development assistance from BASF AG, BWC projected [***] share of the phthalo market by [***] and began planning for possible construction of a domestic phthalo manufacturing facility. These concepts were incorporated into the [***] plan. (CX 723CC).

112. In a similar vein, some industry firms referred to a "phthalocyanine market" in connection with the analyses of their expansion or entry plans. At the request of [***] a chemical marketing consultant, prepared a 109-page report entitled "PhthalocyanineMarket and Business Entry Analysis." (CX 3846; [***]). This report analyzed the U.S. market for phthalocyanines and gave conclusions relating to the advantages and risks of [***] entering the phthalocyanine pigment business. (CX 3846(5)G–(5)N). When [***] considered the construction of a new phthalocyanine plant, it commissioned a market study. The study, prepared by the [***] was entitled "A Strategy for Penetrating the U.S. Phthalocyanine Market." [***]

113. The leading sellers of phthalo pigments maintain a separate research and development group for phthalos within their R&D **[50]** departments. [***] divides its organic pigment research into three pigment groups, one of which is phthalocyanines, and its quarterly research reports contain a separate section for phthalos. (CX 3232D; 3233B; 3234D). [***] R&D program has a separate section for phthalocyanine projects. (CX 3108I–J). CPD, before the acquisition by BWC, had a phthalocyanine R&D group and a senior chemist for phthalocyanines (CX 2005PPP; Malchick 3057) and developed separate R&D plans for phthalocyanine pigments. (CX 2063, 2068FF–KK; 2070F–K; 2071UU–ZZ).

114. There is no separate trade association for phthalocyanine pigment manufacturers. (Smith 1527–28; Whittemore 1994; Geiss 2167; Weissglass 2532; McKenzie 6921–22).

115. A number of industry witnesses testified that there is no separate market or submarket for phthalocyanine pigments. Harold C. Whittemore, Senior Vice-President of Sun Chemical (a leading seller of phthalo pigments), testifying for complaint counsel, stated that he did not believe there is a differentiable phthalocyanine pigment market in the United States. (Tr. 1981). Dr. James Canon, former Vice-President of Harshaw Chemical and General Manager of Harshaw's Color Department, testified for respondent that there is no phthalocyanine submarket and that phthalos are "just another

family of pigments." (Tr. 12,525). No industry witness testified that phthalos constituted a separate or submarket.

116. The Organic Pigment Report series published by the International Trade Commission (ITC) report production, consumption, import and export data for organic pigments for the United States. The ITC Organic Pigment reports break out phthalo blues and phthalo greens from other blues and greens. (CX 16L–M, S–T; 3987K–L).

117. Phthalocyanine pigments and diarylide pigments are the two classes of organic pigments known to contain levels of polychlorinated biphenyls (PCBs) in excess of 50 ppm (parts per million). PCBs are suspected carcinogens. Because of federal regulations effective July 1, 1979 which limit PCB levels to 50 ppm in manufactured goods, phthalocyanine pigment suppliers have been under pressure to modify their production processes to lower the PCB content of their phthalo pigments. (CX 766R). As a result of the PCB problem, the Ecology Committee of the DCMA formed a Phthalocyanine Subcommittee. (CX 3980D; Smith 1528; Weissglass 2533). Dr. Hugh M. Smith, Director of Research and Development of the Pigment Division of Sun Chemical, and a member of the DCMA Phthalocyanine Subommittee, explained the purpose of the group and stated that the Subcommittee "very carefully avoided discussion of marketing aspects in these meetings." (CX 3976–78; Smith 1528).

118. CX 3977 was prepared before the Phthalocyanine Subcommitteeof the DCMA Ecology Committee was formed. Its purpose was to present **[51]**the industry position to the Environmental Protection Agency, which was considering strict regulation of PCBs in the diarylide and phthalocyanine pigment industries. According to Dr. Smith, CX 3977 was an "advocacy document" designed to obtain as much leniency as possibly in the regulation. (Smith 1383, 1530–32).

E. *Disputed Pigments: Carbon Black, Fluorescent Pigments And D&C/FD&C Lakes*

119. Carbon black is an organic pigment in the sense that it consists of carbon molecules and is insoluble. (Malchick 2963–70; Hahn 4042–43; McKenzie 6924).

120. Carbon black is produced through a controlled combustion process in which various types of organic materials are burned slowly to yield carbon residues. (Malchick 3183).

121. About 95% of all carbon black is used as a compounding and reinforcing agent in the production of rubber in the United States. A relatively small amount of carbon black is used to impart black in inks, coatings and some plastics, usually as a blend with other

pigments. (Panush 2366; Stammen 2461–62; Malchick 2963, 3216, 3233–34).

122. The magnitude in value or volume of carbon black used as a colorant in the United States is not known. Richard L. Alsager, Marketing Research Manager of BWC's Pigments Division, produced a rough estimate of the dollar value of carbon black used as a colorant in 1978 at [***] million (Alsager 3747). The reliability of this figure is problematical at best.

123. The price of carbon black is about 50 cents per pound. (Stammen 2465). By blending a black organic pigment with less expensive carbon black, a user would be able to achieve some economy in large volume applications. [***] testifed that carbon black was the "basic black colorant" in his printing ink business. [***]

124. The degree to which carbon black is used as a substitute for organic pigments in such applications as printing inks and coatings is considered to be very small. (Papillo 1841).

125. Although carbon black is an organic product, there is convincing evidence that by trade usage carbon black is not generally treated as an organic pigment and sometimes is treated as though it were an inorganic product. F. 126–27, 139–40, *infra.*

126. The *Colour Index* lists Pigment Black 6 and 7, which are carbon blacks, among inorganic pigments. (Malchick 3224, 3226–28). [52]The *Pigments Handbook* (and some end-use industry marketing studies) did not group carbon black with other organic pigments. (Malchick 3215, Alsager 4866–67, 4872–75). Sol Panush, Manager of Color of Celanese Corporation and an automotive coatings specialist since 1941, testified that he considered carbon black to be an inorganic pigment. (Panush 2333, 2366). And there are authoritative chemical reference works which classify carbon black as an inorganic material. (Malchick 3249–50).

127. The 1978–1979 Membership Directory of the Dry Color Manufacturers Association ("DCMA") contains a small number of pigment producers which also produce carbon black. (Alsager 4857–59). But, the names of some firms known to be carbon black producers are not included. (CX 3976D–H; Alsager 4849–53). In any event, Mr. Papillo testified that the activities of the DCMA do not concern carbon black. (Papillo 1841). And the DCMA's recent presentation to the EPA concerning organic pigments specifically excluded carbon black, along with titanium oxide (white), from the scope of the presentation. (CX 3102A, H).

128. Fluorescent pigments are organic or inorganic pigmentary products used in color applications which require luminescence. (CX

3102B; Papillo 1862–63; Whittemore 1988; Malchick 2970–79, 3251–52).

129. Organic flourescent pigments are produced by incorporating fluorescent dyes (organic) into polymar resins and finishing the dyed polymar into insoluble particulate products. (Hahn dep. CX 5088UU–VV; Malchick 2971). Organic fluorescent pigments differ from conventional organic pigments, which are produced by chemical synthesis and finishing. In a sense, organic fluorescent pigments are not true organic pigments; they are pulverized dyed plastics which can be used in pigmentary application.

130. There is a record reference to a report on the plastics industry prepared by the Charles H. Kline consulting firm which called daylight fluorescent pigments "true organic pigments." (Alsager 4873–74). And Dr. S.P. Malchick, General Manager of BWC's Chemetron Pigments Division, likened the production process of organic fluorescent "pigments" to the process used to produce some azo type organic pigments [***] (Malchick 3213).

131. Organic fluorescent pigments are treated as distinct products from organic pigments. The *Pigments Handbook* discusses fluorescent pigments not in organic pigments chapter but in two special chapters entitled "Luminescent Pigments, Organic" and "Luminescent Pigments, Inorganic." (Malchick 3253–54). **[53]**

132. [***]

133. Flourescent pigments are not interchangeable with organic pigments and organic pigment prices are determined without regard to fluorescent pigments. (Papillo 1838A–39; Whittemore 1935).

134. To the extent some organic fluorescent pigments are used in printing inks, coatings and plastics, they are used by the same industries which use organic pigments.

135. D&C lakes and FD&C lakes are colorants (dyes, organic and inorganic pigments) which are certified by the FDA for use in drugs and cosmetics (D&C) or in foods, drugs and cosmetics (FD&C), as the case may be. (CX 3108; Smith 1344–45; Papillo 1862–63; McKenzie 6924). Most FD&C pigments are inorganic and some are dyes. (Malchick 3261–62, 3263–66).

136. The FDA certified pigments and non-certified pigments are not practical substitutes for each other. Sun Chemical produces both Pigment Red 53:1 (Red Lake C) and D&C Red No. 9, which are chemically identical, but Sun's D&C Red No. 9 is considerably more expensive (several dollars per pound) than Red Lake C. (Smith 1345–47). This is typical of the price relationship between D&C colorants and their non-certified organic pigment counterparts. (Whittemore 2001). The reason for the price difference is that Sun must carefully

control the manufacturing process for the D&C colorant so that its purity is acceptable by FDA standards. (Smith 1346). [***]

137. Organic pigment prices are determined without regard to the prices of the FDA certified pigments. (Whittemore 1935–36).

138. Sun Chemical's customers for Red Lake C are different from the customers for D&C Red No. 9. Colorants used in drug and cosmetic products must be FDA-certified colorants and Red Lake C cannot be used. Conversely, customers do not replace Red Lake C with D&C Red No. 9. (Smith 1347). However, [***] testified that certain [***] have been sold as "normal" organic pigments after they failed the FDA's certification tests. He stated that the same equipment and process are used to produce both types of organic pigments. [***]

139. In response to complaint counsel's industry survey, companies which reported 1977 sales data for organic pigments rarely **[54]** reported data for carbon black, fluorescent pigments or D&C/FD&C lakes. The companies which reported data for both were:

<u>Carbon Black</u>
DuPont
<u>Fluorescent Pigments</u>
Crown Metro
Hercules
<u>FD&C Lakes</u>
DuPont
Kohnstamm
<u>D&C Lakes</u>
Kohnstamm
Max Marx
Sterling Drug (Hilton-Davis)
Sun Chemical

(Krause 978–79, 983–84). Neither CPD nor BWC produced any carbon black, fluorescent pigment or D&C/FD&C lake during 1972, 1977, 1978 and 1979 (the years covered by the survey). (CX 9(5)O–(5)P).

140. The organic pigment data collected and reported by the ITC do not include data for carbon black, fluorescent pigments or D&C/FD&C lakes. (CX 16G) (FD&C lakes are not to be reported in the ITC's organic pigments section but rather as dyes); *compare* CX 3987T *with* CX 155B *and* Panush 2366 (companies which produce fluorescent pigments and carbon black are not listed by the ITC as organic pigment manufacturers).

141. "Activated pigments" or "activated products" are obtained

by finely "grinding" certain crudes (intermediate products) but stopping short of completing the finishing process. In this sense, activated pigments may be characterized as "semi-crude" or "semi-finished." (Smith 1474–77). Activated products offer users some economy by permitting them to complete the finishing process with their own equipment. (Kohnle 4552–53). Activated pigments were designed to compete with finished pigments. (Hahn 4107–13).

142. Activated pigments sold by BWC appear to have achieved market acceptance. [***] The magnitude of all activated organic pigment sales in this country is not known. For the purposes of this case, "activated" pigments are treated as organic pigments. **[55]**

143. [***] testified that activated products are "crude" materials because they must undergo further finishing to produce the proper particle size and configuration. [***] testified that activated products are a "kind of organic percursors" which can be further "processed into a pigment," and that "an activated pigment is not a pigment." [***]

F. *Interpigment Competition*

144. In theory, pigments of similar colors are potential substitutes for each other. Historically, there has been little interpigment competition between organic pigments and the less expensive inorganic pigments, for the reason that the performance properties rather than the price determine the end-use applications of a given pigment. However, a relatively small number of inorganic pigments which complement organic pigments of similar colors are sometimes blended with organic pigments for some end-uses within the limits of the performance properties required for particular applications. In recent years, new technologies have made computer-programmed color-matching possible. However, inorganic pigments as a class are not practical substitutes for organic pigments. F. 145–64, *infra.*

145. Some inorganic pigments are or can be used in conjunction with or in place of the more expensive organic pigments in some applications. They include iron blue, ultramarine blue, chrome yellow, molybdate orange, chrome green, chrome oxide green, cadmium pigments and nickel titanate pigments. In all cases, however, the performance properties required for a given application determine the user's decision. (Smith 1532–34; Papillo 1874; Geiss 2151–56; Malchick 2912–21; McKenzie 6912–21; Mertz 7120–21).

146. A 1979 study of organic pigments prepared [***] (a producer of organic pigments) stated that, "Any discussion of the market for organic pigments would be incomplete without some mention of the inorganic pigments which, to some degree, may compete with

organics [***] select inorganic pigments are believed to be in direct competition with organics. [***] (CX 3946SS).

147. An ink producer may wish to produce a certain shade of blue through use of an inorganic pigment like iron blue and/or an organic pigment like phthalo blue. *If* both pigments produce the desired result (*assuming* all other relevant performance characteristics are [**56**]equal), the choice will be an economic one. (Smith 1520–23; Stammen 2454–55; McKenzie 6912–13, 6919, 6952–55; Canon 12,540–41, 12,575). Mr. McKenzie noted that iron blue and phthalocyanine blue also compete in the plastics and coatings end-uses. (Tr. 6914–15).

148. Many publication gravure ink producers mix phthalo blue with iron blue in order to cut the cost of the final product without significant changes in the final result. [***]

149. Ultramarine blue and phthalocyanine blue also compete directly in some end-uses. [***] (Tr. 4902–03).

150. Alkali blue and iron blue also compete in some applications. (Smith 1518–20). Mr. Alsager testified that CPD was keenly aware of the direct competition of alkali blue and iron blue in the typewriter ribbon and carbon paper segment of the ink end use, "where cost development in both iron blue and alkali blue forced the products, in an end use calculation, to be extremely price competitive." He testified that "[d]ual formulas are maintained depending upon the price of iron blue or the price of alkali blue in these applications, and the customers switch back and forth, based upon the prices they are able to negotiate at any point in time." (Tr. 4905).

151. Some producers of organic pigments also produce inorganic pigments for sale to the same end-use industries to which they sell organic pigments. American Cyanamid, for example, produced (until very recently) phthalo blue as well as iron blue, both of which were purchased and used by printing ink producers. Until January 1, 1980, American Cyanamid produced a range of inorganic chrome pigments as well as its line of organic pigments. DuPont, Harshaw and CIBA-GEIGY also produce some of these inorganic pigments in addition to organic pigments. (Lipton 1625; Schober 1698–1712; Papillo 1857, 1874–75; Geiss 2124; Panush 2352–54; McKenzie 6904, 6907–12).

152. Some customers in the major end-use industries purchase both organic pigments and the inorganic pigments discussed hereinabove. (Panush 2204; McKenzie 6907–08; Mertz 7056–59).

153. The pigment user generally seeks a certain color in his particular application, certain performance characteristics (lightfastness, heatfastness, durability and rheology, among others) in his particular application and price. If an inorganic pigment [**57**]meets

the requirements of color and performance, and is cheaper than an otherwise similar organic pigment, a customer will very likely use the inorganic pigment. (Malchick 2876–80).

154. A computer programmed color-matching service available from Allied Color Systems, Inc. can enable a pigment user to obtain a formulation best suited for his performance and economic needs using available pigments, organic and inorganic. The user's requirements are programmed into a computer and the user obtains an analysis of those pigments, organic or inorganic, which best fulfill his requirements. The computer will also indicate whether blends of organic and inorganic pigments will satisfy the customer's requirements, the ratio of the blend and its cost. With this information, the customer can select the color he wants at the lowest possible cost consistent with the performance required. [***]. Mr. Mertz of Applied Color Systems explained that his company produces "color control systems for the use of color formulation and production control in various companies that produce colored products." This includes customers in all end-use segments. (RX 7086; Mertz 7056, 7059–82, 7096–7121, 7104–05, 7172–75).

155. Dr. Malchick and Dr. Bock, a group leader within the development group of Applications Technology for pigments of BASF AG, and in charge of the development of pigments and dyestuffs applications in the non-textile field, testified about the results of chemical tests of selected color samples taken from ordinary consumer products in the United States. Dr. Malchick assembled various pairs of physical exhibits of similar commercial items of almost identical color in this country. (Tr. 2936–59). Dr. Bock and his staff in Germany then chemically analyzed the colorants used in the physical samples. (Bock 3413–18). One of each of these pairs of samples was shown to contain an organic pigment while the other was shown to contain an inorganic pigment. (Bock 3417). *See* Physical exhibits RX 7007 and 7008 (boxes from photographic items, colored "Kodak Yellow"), and RX 7057 and 7058 (tubes of yellow acrylic paint).

156. Some organic pigments have unique properties which make them particularly suited for a specific end-use, and there are no good substitutes for these pigments in that specific end-use. For example, a producer of automotive paint may use a perylene, quinacridone or benzimidazalone pigment to achieve a certain shade, with the requisite durability, that cannot be produced with any other pigments. [***]. However, there are other uses in which several organic pigments or inorganic pigments, or mixtures of the two, can be substituted. [***]

157. Iron blue is used in a blend with phthalo blue in automobile coatings to produce greener shade blues. Yellow shade greens are achieved in auto coatings by blending phthalo blue with [***] **[58]** [***] Indanthrone blues (organic blues) can be blended with other pigments to replicate red shade phthalo blue. [***]

158. In the printing ink industry, phthalo green is only rarely used in process color printing to achieve a green color. Instead, an ink made with blue pigment is combined in the printing process with an ink made with yellow pigment to get the final green color. The blue pigment may be iron blue or phthalo blue, and the yellow pigment may be chrome yellow or diarylide yellow, depending on the application. (Stammen 2410–14). The end user therefore has a range of organic and certain inorganic pigments from which to choose. His choice is dictated by the performance requirements of the application and the cost of the pigment or pigment mixture. (Geiss 2153, 2167–68; Stammen 2458–59).

159. Mr. Alsager of BWC testified that "Chemetron produced an entire line of composite pigments" to compete with phthalo green. These "Kleer Greens" were combinations of [***] (Alsager 4897).

160. Phthalocyanine pigments, both blue and green, are polycyclic organic pigments some of which have high performance characteristics. Properties of high performance pigments include high lightfastness, good weatherfastness and stability under severe atmospheric temperatures during processing. (Papillo 1776–79; Malchick 3275–79).

161. Unlike phthalocyanines, iron blue and alkali blue are not high-performance pigments. (Smith 1371–72). Phthalo blue and iron blue have different performance properties. (Smith 1579–80; McKenzie 6937–38). For example, phthalo blue is more brilliant and less "gray" than iron blue. (Smith 1579–80; Stammen 2416). The phthalo blues and iron blues used in printing inks are quite different in hue. Iron blue is a red-shade blue, in contrast to the green shade of phthalo blue. (Stammen 2409, 2416).

162. The interchangeability of iron blue and phthalo blue is extremely small. (Papillo 1803). Similarly, viewed in the context of all blue pigments consumed, there is little competition between phthalo blue and alkali blue. (McKenzie 6950–51).

163. In order to achieve a non-reddish blue ink, phthalo blue must be used instead of iron blue. [***]. Also, iron blue cannot be used in place of phthalo blue when an ink is supposed to produce a brilliant printed image. [***]

164. According to a 1976 report to the President by the ITC, iron blue and phthalocyanine blue are not "essentially **[59]**interchange-

able" in the same uses and therefore not "directly competitive." (CX 3990T). The ITC based this conclusion on the different end uses and cost-effectiveness of the two pigments. Because of its superior performance properties, phthalo blue is used, for example, in automotive coatings and detergent-resistant inks, while iron blue is used in less demanding applications such as carbon paper. Phthalo blue's higher tinctorial strength is more than offset by its higher price. Therefore, phthalo blue is more costly to use. (CX 3990S–T; UUU–WWW).

G. *Price Sensitivity*

165. Pigments are complex and heterogeneous chemical products which are highly end-use oriented. From the demand side, the most important elements are, in a descending order: (1) color, (2) performance properties and (3) price. *See* F. 63–97, *supra.* Consequently, the degree of price competition in pigments, *inter se* or between organics and inorganics, may be expected to be rather small. To the extent that the demand for a given pigment may be said to be primarily a function of its color and performance properties, price sensitivity analysis may not be as meaningful in delineating the product market in this case as it is in most Section 7 cases.

166. Moreover, three considerations further limit the usefulness of price sensitivity analysis in this case. First, it would be important but difficult to hold constant many non-price factors which are known to affect significantly the relationship between organic pigment prices and sales quantities (*e.g.,* a change in demand (taste or government regulation) or in supply (raw material shortage or production stoppage)). (Glassman 9102–07, 9114–16; Kamerschen 11,154–55). *See* RX 2126–30.

167. Second, to the extent the tinctorial strength of pigments varies, a comparison of unit prices of pigments may not reflect the true relative costs of the pigments to the user. *See* RPF 170; Glassman 9180–85. This problem is greatly magnified when one compares the annual average price of organic pigments with the annual average price of inorganic pigments (as respondent did in this case).

168. Third, the amount of time usually required for pigment product modifications and the prevalence of the time-consuming (two to five years or longer) product approval process involved in many end-use applications, strongly suggest that the true competitive relationship between pigments may not be reliably reflected in a comparison of annual price and consumption data. *See* Glassman 9135–36, 9138–42.

169. Not surprisingly, while Mr. Glassman (respondent's expert

witness who sponsored the price and quantity series of RX's) opined [60]that his price/price and price/quantity analyses showed that the result was inconsistent with the existence of an organic pigment market and a phthalocyanine submarket, Dr. Kamerschen, complaint counsel's expert witness who reviewed and analyzed the same data, gave the opposite opinion. Nevertheless, the record evidence related to the elasticity of demand and price sensitivity is summarized hereinbelow.

170. No organic pigment can be substituted for another organic pigment without a corresponding change in the properties or performance of the finished product. (Smith 1526–27, 1533–34; Papillo 1859, 1869–70; Panush 2337).

171. The cross-elasticity of demand and interchangeability of use is especially limited in the coatings and plastics end-use industries where the aesthetic appeal of a particular hue or the technical demands of an application process may as a practical matter foreclose substitution amoung pigments. (Schober 1652; Panush 2264–67). A producer of automotive coatings will require, for example, a pigment that has been proven to withstand two years or more of test exposure in Florida. A pigment that lacks such durability or which has not undergone such testing is not acceptable for automotive coatings. (Papillo 1793–94; Panush 2233–34). Similarly, plastics end-use applications require pigments which are resistant to a high degree of heat stress. (Geiss 2078).

172. In process printing, four colors—blue, yellow, red and black—are used, and only pigments or blends of those colors can be used. (Stammen 2399–2401; Malchick 2962). Any other shade would produce unsatisfactory results in the finished product. (Stammen 2458–59).

173. Phthalocyanine pigments are not generally interchangeable with one another. Mr. Panush testified that he was personally aware of some 60 different phthalocyanine blues and 30 phthalocyanine greens, and that these were not directly substitutable for one another. He stated that they are chemically nearly identical products but the difference comes in the processing, in the preparation of the pigment, and the particle size and its distribution. (Panush 2337–41). Mr. Panush further testified that, despite the identity of their *Colour Index* numbers, phthalocyanine pigments designed for the ink industry are not substitutable for phthalocyanine pigments produced for the automotive coatings industry, crystallizing phthalocyanine pigments are not substitutable for non-crystallizing phthalocyanine pigments, and flocculating phthalocyanine pigments are not substitutable for non-flocculating phthalo-

cyanine pigments. (Panush 2337–41; Smith 1526; Papillo 1856–57, 1866–67; McKenzie 6955–56).

174. Michael L. Glassman, an industrial organization economist, who was formerly employed as Chief of the Division of Economic **[61]** Evidence of the Bureau of Economics at the FTC (later as Assistant Director for Economic Evidence at the FTC and now employed by Glassman-Oliver Economic Consultants, Inc.) testified in respondent's behalf. He prepared a number of exhibits, in an attempt to ascertain whether phthalocyanine pigments were reasonably interchangeable products. These RX's analyzed the change in price over several years for alpah blue and beta blue phthalocyanine pigments and phthalocyanine Green 7 and Green 36. He found one phthalocyanine blue "having a very substantial additional increase in price, Green 7 increasing about the same rate two years in succession and the rate of increase in price of the two remaining pigments plummeting down to just about the 5% range, so that the behavior year-to-year among these pigments is quite different in terms of price." (Glassman 8500). Mr. Glassman concluded that these exhibits showed price movements which were "not consistent with a strong substitution relationship among the pigments . . . and as an economist this will be a piece of evidence that it will be inappropriate to include these four phthalocyanine pigments in the same market for purposes of evaluating the competitive effects of the merger." (Glassman 8499–8501, 8503–11, 8537–41). In discussing the price differences and divergent price fluctuations of different phthalocyanine organic pigments within the same *Colour Index* number, Mr. Glassman concluded that "sometimes these differences in performance characteristics are substantial enough so that the products are really not good substitutes for one another." (Glassman 8525–34). *See* RX 2113 (Pigment Blue 15:0); RX 2114 (Pigment Blue 15:1); RX 2115 (Pigment Blue 15:2); RX 2116 (Pigment Blue 15:3).

175. Mr. Glassman also examined the prices (illustrated on RX 2113) of different producers' blue phthalo pigments within the same *Colour Index* classification and noted that in 1976, the most inexpensive phthalo product was 63% of the price of the most expensive phthalo product. In 1977, that differential decreased to 51%, with the cheapest pigment being sold at $3.42 and the most expensive at $7.02. (Glassman 8518). Mr. Glassman also examined the price movements from year to year, and found in one year such wide movements that created "a situation which generally would be regarded as impossible if these products were really close substitutes." (Glassman 8518). He stated that it demonstrated that the prices did not behave in a fashion consistent with strong substitu-

tion. (Glassman 8500). Mr. Glassman concluded it "is wholly inappropriate to define a market as including only phthalocyanine pigments and, therefore, the exercise of calculating market shares within that market for purposes of evaluating competition is a procedure which has no economic meaning." (Glassman 8547).

176. In an attempt to test the hypothesis that all organic pigments were substitutes and capable of being grouped in the same market, Mr. Glassman analyzed the price movements of different pairs, chosen as the most likely candidates for substitution, of organic pigments over time and found that, for virtually every pair of [62]pigments tested, prices did not move together and frequently moved in opposite directions. (Glassman 8591–8570). From RX 2109, Mr. Glassman observed that the substitution relationship, based on similarity of price movements, of alkali blue with either green shade phthalocyanine blue or red shade phthalocyanine blue was as strong or stronger than the relationship between either of the two phthalocyanines. (Glassman 8496–97, 8502–04, 8541–44). Mr. Glassman obtained similar results from his price/quantity studies of pairs of organic pigments. The price-quantity studies were to test the hypothesis that a rise in the price of one pigment should lead to an increase in the quantity of another pigment, if they were substitutes, as demand shifted to the less expensive pigment. Mr. Glassman observed "generally quite inconsistent reactions of quantities to price changes." (Glassman 8570–77). For only one pair of red organic pigments did Mr. Glassman's analysis show strong substitution. (RX 2122; 2130; Glassman 8564–65, 8571–72).

177. Mr. Glassman concluded that the grouping of all organic pigments was "an inappropriate grouping to determine a market." (Glassman 8453). Mr. Glassman further stated that, based on his review of the transcripts, his conversations with industry members and statistical studies that he performed, "the idea of starting with a common chemistry was a misguided venture in terms of defining a market because it ignores the realities of substitution as it actually takes place . . ." (Glassman 8467). He further stated that, if one assumes the existence of an organic pigments market, one should include at least those inorganic pigments which compete directly with organic pigments included within the market definition, for example, iron blue, chrome yellow, cadmiums, molybdate orange and nickel titanates. (Glassman 8580–81).

178. On the other hand, Dr. Kamerschen, a respected industrial organization economist and Distinguished Professor of Economics, University of Georgia, who testified as complaint counsel's expert witness on rebuttal, concluded that the price data in evidence was

more consistent than inconsistent with the existence of an organic pigment market.

179. On the basis of statistical analyses of price data for 12 selected organic pigments, Dr. Kamerschen observed a significant positive correlation in their prices and concluded that the result is consistent with organic pigments constituting an economically significant product market. (Kamerschen 11,132–34, 11,140–42, 11,144–45). *See* CX 7044.

180. Dr. Kamerschen's statistical analysis also showed that the prices of molybdate orange (an inorganic pigment) are not so highly correlated with the price of the 12 organic pigments as the organic pigments' prices are among themselves. Dr. Kamerschen testified that this was an indication that molybdate orange is not in the same market as the 12 selected organic pigments. (Kamerschen 11,150–51). *See* CX 7044. **[63]**

181. Dr. Adelman, an eminent industrial organization economist, testifying in surrebuttal, strongly criticized Dr. Kamerschen's reliance on price correlation analysis. In Dr. Adelman's view, Dr. Kamerschen's correlation analysis of organic pigment prices is invalid because inflation tends to make all commodities positively correlated in prices movements, and Mr. Glassman's analysis of relative prices over time is superior to Dr. Kamerschen's formal statistical treatment for the reason that Mr. Glassman attempted to avoid some of the built-in inflation bias. (Adelman 12,237–38, 12,241–43, 12,248–50, 12,257–61, 12,491).

182. From RX 10010, scatter diagram of organic price changes, Dr. Adelman observed that the diagram indicates there is no true correlation among the pigments Dr. Kamerschen analyzed, and that the price correlation Dr. Kamerschen found was attributable mainly to the price surge associated with the oil embargo in 1974 and to a lesser extent in 1975. (Adelman 12,270–76, 12,281–82).

H. *There Are Significant Differences Between Organic Pigments Used In Europe And Those Used In The United States*

189.* Dry pigments are used by virtually all users of organic pigments in Europe. European dry pigments are formulated for use with particular vehicle systems and often are not directly transferable to the United States consumer. (Bock 3399; Hahn 3967).

190. Many printing ink producers in the United States use flushed pigments in which the water from the presscake form is replaced by some kind of oil or other vehicle to create a semi-liquid pigment dispersion. This form of organic pigment may more readily

* There are no Findings numbered 183–188.

be mixed into the material which becomes an oil or paste ink than a dry pigment can if, as is usually the case in the United States, the printing ink producer is capable of using flushed pigments. (Smith 1320–21; Whittemore 1926–33; Geiss 2160; Weissglass 2489–90).

191. Flushed pigments represent approximately half of all organic pigment sales to the printing ink industry in the United States. The printing ink industry consumes approximately half of all organic pigments sold in the United States. (Whittemore 1930–32; Geiss 2160; Alsager 3598–99; Hahn 4105).

192. Historically, European inkmakers use almost exclusively dry pigments and a large segment of the United States printing ink industry is closed to producers of dry organic pigments. (Geiss 2137; Aschner 5341–42, 5373–78; Glassman 8751). **[64]**

193. European ink producers generally make their inks with solvents which are classed chemically as "aromatic." United States ink producers generally use solvents which are classed chemically as "aliphatic." The two types of solvents are incompatible. (Whittemore 1942, 1977–78; Stammen 2437–40, 2467–68; Bock 3399; Hahn 3966–67; Kohnle 4409; Parker 4951–52).

194. An organic pigment developed for use in one ink system cannot be satisfactorily used in the other ink system; the color and color strength will differ markedly, and other characteristics may differ as well. (Stammen 2451–54; Hahn 3962–63; Aschner 5362–64). Mr. Aschner described the difficulties involved in marketing in the United States the pigments created for European end users as trying to sell "a left-handed shoe [where] everybody is buying right-handed shoes." (Tr. 5413).

195. Different organic pigments are used for reds in printing inks. In the United States, barium lithol is most often used; in Europe, lithol rubine is more common. (Whittemore 1964–65; Aschner 5362–64).

196. Different vehicle systems are also used for automotive coatings in the United States and Europe. In the United States, thermosetting or thermoplastic acrylics are used; in Europe, alkydmelamine vehicles. Weatherability requirements are also different. (Whittemore 1942–43). Mr. Parker of ICI testified that European auto coatings producers use a different system with different product requirements than is used in the United States. (Tr. 4952–53).

197. In the production of coatings for architectural uses in the United States, aqueous systems for incorporating the pigment into a paint are generally used. In the production of coatings for architectural uses in Europe, solvent-based systems are generally used. [***].

198. Because of the different technical requirements of organic

pigment users in the United States, it is sometimes difficult for European organic pigments to be accepted and sold in the United States. [***] **[65]**

I. *Organic Pigments Constitute A Valid Product Market*

199. In a formal submission to the FTC made prior to the issuance of the Complaint, respondent took the position that organic pigments was a relevant product market in which to assess the effect of BWC's acquisition of CPD. (CX 1907BB).

200. The record evidence as a whole shows that organic pigments as a group constitutes a valid product market for the purpose of evaluating the competitive effects of the acquisition challenged in this proceeding.

(1) *Industry Recognition Of The Organic Pigment Industry As A Distinct and Significant Economic Activity*

201. BWC's internal documents recognize the existence of the "organic pigments market" and estimate the size of that market and the market shares of BWC and its competitors. (CX 186F,K; 277H–L, Y; 212Y–AA; 702B; 723E–V; 724; 1841A; 1843A; 1951B). For example, [***] BASF and BWC prepared a joint report entitled "Survey of the U.S. Organic Pigment Market and the BASF Group's Position with Respect to It." (CX 703B). Similarly, in BWC's [***] plan the market shares of BWC and its major competitors in the "organic pigment market" are calculated. (CX 241FF). CPD's documents also analyze the organic pigments market and estimate the market shares of CPD and its competitors therein. (CX 1801A–B, H–I; 2047H–L).

202. The organic pigments market has been evaluated as the basis for investment decisions by BASF and BWC. BASF and BWC evaluated the proposed acquisitions of [***] (CX 908; 910B), [***] (CX 955), and CPD (CX 960A, E–F; 927A) in the context of a United States organic pigments market.

203. Other organic pigments producers also recognize that organic pigments constitute a separate market and base their business decisions on their analyses of it. [***] compute their respective shares of the "organic pigments market" in their long-range business plans. (CX 3005B, G; 3010Q, PP; 3104D–J; 3105B). Likewise, [***] analyzes a "U.S. organic pigment market" in its marketing documents and estimates market shares of itself and its competitors. (CX 3302A; 3307B–D). [***] also examines the "organic pigment market" separately from inorganic pigments. (CX 3418C, V, W). In a study completed in 1978, [***] thoroughly reviewed the "U.S. organic

pigment market" as it weighed its alternatives for future involvement in the pigments business. (CX 3801). [66]

204. In their documents, manufacturers of organic pigments consider other manufacturers of organic pigments to be their competitors. Strengths and weaknesses in the production and sale of organic pigments and shares of the organic pigments market are regularly analyzed for the following companies: American Cyanamid, American Hoechst, BWC, Chemetron, CIBA-GEIGY, DuPont, Harmon Colors, Hercules, Hilton-Davis, and Sun Chemical. (CX 212K, AA; 239D; 241FF; 1841A; 2047K; 3010FFF–LLL; 3105B; 3302B–C; 3418J–AA; 3801J).

205. Within the PIC Department of BWC, organic pigments and dyes were separate product categories, with separate sales forecasts, and profit analyses. (CX 155B, D, G, H; 186B; 230A–F; 235A–E; 1842D, I). Sun Chemical and American Hoechst sell only organic pigments (CX 2036F; Geiss 2055), and the entire product line of Harmon Colors is organic pigments, except for two inorganic preparations. (Schober 1642). Magruder Color does not produce inorganic pigments; Indol Chemical, [***] has never produced inorganic pigments. [***] From 1973 to 1978, CPD produced only one inorganic pigment. (Malchick 2838). DuPont and American Cyanamid, which sell both organic and inorganic pigments, analyze and categorize the two pigment types differently. (CX 3224B–D; 3418C, V, W).

206. The organization and activities of the Dry Colors Manufacturers' Association ("DCMA"), the trade association for the colored pigments industry are divided along organic and inorganic lines. The DCMA's Ecology Committee is divided into an Organic Section and an Inorganic Section, and the DCMA has an Organic Pigments Subcommittee. (CX 3980D–E). The DCMA has also prepared reports which differentiate between the organic and inorganic pigment industries. (CX 3102A, E; 3973; 3976C).

(2) *Public Recognition Of The Organic Pigment Industry As A Distinct And Significant Economic Activity*

207. The trade association for colored pigments companies is the Dry Colors Manufacturers' Association ("DCMA"). Domestic manufacturers and importers of colored pigments, as well as domestic producers of pigment intermediates, are eligible for membership in the DCMA. (CX 3102E–F).

208. The International Trade Commission ("ITC") (formerly the Tariff Commission) annually issues a report on production and sale of various synthetic organic chemicals, including organic pigments and dyes. The data for organic pigments and those for dyes are

reported separately. (CX 16B). The SIC code which applies to the products [67]included in the organic pigments section of the ITC report is 28653. (CX 16I). These reports are relied on by industry firms to assess their position in the organic pigment industry. (CX 1843; 2013A; 3006H–L; 3801B).

209. Organic pigments are classified under SIC product codes 2865, 28653 and 2865311. Inorganic pigments are classified under SIC product code 2816. Carbon black is classified under SIC product code 2895. *Standard Industrial Classification Manual* (1972).

210. The *Colour Index* places organic and inorganic pigments in separate classifications. (Malchick 3219–24). Similarly, organic and inorganic pigments are discussed in separate sections of the *Pigments Handbook.* (Malchick 3215). Both the *Colour Index* and the *Pigments Handbook* are recognized as authoritative sources of information concerning pigments. (Smith 1306, 1511).

211. The tariffs for organic and inorganic pigments are different. Before the Tokyo Round of tariff negotiations, organic pigment imports were classified under tariff item number 406.70 (CX 3219A; 3989A) and were subject to a duty of 20% of the American selling price ("ASP") of a competitive domestic product, or 12½% if there were no comparable domestic product. (CX 1907M). Inorganic pigments were classified under different tariff numbers and were subject to lower tariffs (only two inorganic pigments had tariffs higher than 10%). (CX 3971B). Following the Tokyo Round, the tariffs and classification numbers for organic pigments and inorganic pigments remain separate. (CX 1233A; 1234E. *Compare* CX 1234E *with* F–H).

212. The U.S. Department of Commerce compiles statistics for organic pigments and exports. (CX 3987F).

(3) *Peculiar Characteristics and Uses*

213. Organic pigments have distinct chemical and physical properties (such as high coloring strength and brilliance) which make them usable in applications for which dyes and inorganic pigments are unsuitable. (F. 40–42, 63–70, 78–80, *supra*).

214. Pigments and dyes differ significantly in their application and uses. Pigments are applied as small insoluble particles which color or opacify a substrate; they retain their insolubility throughout the coloration process. In contrast, dyes are soluble when applied, although they may later become insoluble. (CX 1951F; 3102C; Malchick 2875–76).

215. Generally speaking, organic pigments are more brilliant, purer, richer in color, and available in more varied colors than [68] inorganic pigments. (CX 3102N; 3986A). They are also usually more

transparent (less opague) than inorganic pigments. (CX 3986A; Panush 2207). Organic pigments tend to be less resistant than inorganic pigments to sunlight, chemicals, heat, and other degrading influences. (CX 3102N; 3986A; Malchick 3208–09). These characteristics are of critical importance and dictate that organic and inorganic pigments have distinctly different end-uses. For example, where brightness is required, an organic pigment will be chosen (Schober 1735). Likewise, organic pigments are used in a metallic automotive coating because of their transparency, while inorganic pigments can be used in other automotive finishes. (Panush 2204).

216. The degree of interchangeability between organic pigments and inorganic pigments is limited. (Smith 1578; Papillo 1800–01). When organic and inorganic pigments are blended together in a coating, they generally contribute different physical attributes to that coating. (Panush 2367). Because of their different properties, inorganic pigments are used far less often in printing inks, but more often in coatings and plastics applications, than are organic pigments. (CX 3946SS).

(4) *Unique Production Facilities And Processes*

217. The raw materials used to produce organic pigments are different from those used for inorganic pigments. (Papillo 1802–03). All organic pigments are derived from one or more of the following compounds of carbon: benzene, toluene, xylene, naphthalene, and ethylene. (CX 3102Q; Smith 1585–86). These intermediates become part of the molecular structure of an organic pigment, but they are not part of the structure of any inorganic pigment. (CX 3101M–N; Smith 1557–59). Organic pigments have sophisticated and complex molecules, whereas molecules of inorganic pigments are rather simple by comparison. (Panush 2204, 2207). The technical barriers to the production of inorganic pigments are lower. (Papillo 1858). In fact, some inorganic pigments occur in nature and can be mined. (Panush 2207).

218. From a research and development perspective, organic pigments have a clearly different chemical basis than inorganic pigments. (Smith 1489). A chemist can develop considerable expertise in organic pigments without developing comparable expertise in inorganic pigments. (Smith 1489).

219. There is significant commonality in the equipment used to synthesize and finish organic pigments. F. 49–62, 98–101, *supra.* The equipment can be, and has been used interchangeably. [***] uses the same equipment to produce Pigment Yellow 12 and **[69]**other diarylide yellow pigments. [***] In addition, by thoroughly cleaning the coupling tank, auxiliary tanks, the filter press, and the drying

and grinding equipment used to produce monoazo yellow pigments, [***] is able to make azo reds in the same production line. [***] The equipment used for rhodamine pigment production is similar to that used for monoazo and disazo pigments. [***]

219A. Respondent has acknowledged that the production technology used to make organic pigments is different from that used for inorganic pigments. (CX 1907BB; Smith 1489). The division of BASF AG which produces organic pigments does not produce any inorganic pigments; indeed, Dr. Erich Stoeckl, the person in charge of BASF's production of organic pigments, stated that he does "not know anything about the process involved in producing inorganic pigments." (Stoeckl dep. CX 5097AA–BB).

220. Besides a commonality of equipment, there is significant commonality of the processes and know-how used to synthesize and finish organic pigments. F. 49–62, *supra.* For example, all azo pigments are produced by the chemical steps of diazotization and coupling. (CX 1951G–H). Thus, the production of Pigment Yellow 12 and Pigment Yellow 14, both diarylide azos, is essentially the same. And there are elements of similarity between the production of yellow and red azos, and between monoazo and disazo pigments. [***] The production of polycyclic organic pigments (*e.g.,* phthalocyanine, quinacridones, and perylenes) is like that of azos in terms of the filtration, drying, and pulverization of the pigment to produce a dry color. [***]

(5) *Distinct Prices*

221. Most organic pigments are considerably more expensive than most inorganic pigments. (Papillo 1801–02; Panush 2207). Organic pigments comprise about 10% of the total quantity but 30% of the total value of all pigments (organic and inorganic). (CX 3986A). Thus, the average price per pound of organic pigments is at least three times that of inorganics.

III. THE GEOGRAPHIC MARKET

222. By agreement between the parties, the relevant geographic market in which to assess the effect of BWC's acquisition of CPD is the United States plus Puerto Rico and the Virgin Islands. (Tr. 162–64). **[70]**

IV. THE NATURE OF COMPETITION IN THE ORGANIC PIGMENTS INDUSTRY—AN OVERVIEW

A. *A Historical Background*

223. The organic pigments industry in the United States is a mature industry. (CX 1958B). Since the first synthetic organic

pigment (lithol red) was developed in the latter half of the 19th century (RA 27), the snythetic chemical colorants industry worldwide was largely dominated by European chemical companies during the early decades of this Century, and it was not until the 1940's that the organic pigments industry in the United States came into its own. In the early 1940's four pigment companies, DuPont, American Cyanamid, Imperial Color and Chemical and Sherwin-Williams, produced much of the output of the organic pigments industry in the United States. (Counihan 5523–24).

224. DuPont was the largest domestic pigment manufacturer and was integrated vertically. It manufactured raw materials for pigments, manufactured the pigments and also manufactured trade sale paints, industrial finishes and automotive coatings. (Counihan 5523). American Cyanamid became a substantial factor in pigment in the early 1940's by acquiring United Color and Pigment Company and also sold intermediates (raw materials) to other pigment producers. Imperial Color and Chemical was a privately held company which produced organic pigments. (Counihan 5523–24). Sherwin-Williams, which entered the organic pigment business in 1896, was vertically integrated. It manufactured raw materials for pigments, produced the pigments and also manufactured trade sales paints, industrial finishes and automotive coatings. (Counihan 5524). Harmon Color, smaller than these four, manufactured high-performance pigments for automotive coatings. (Counihan 5524).

225. The organic pigment industry is end-use oriented. For some years past, the two main end-use industries which accounted for the bulk of organic pigment consumption in the United States have been printing inks and coatings. F. 78, *supra.*

226. In the 1940's Hilton Davis Color Company introduced flushed colors to the printing ink industry. In the late 1940's and early 50's, Holland Color (Chemetron's predecessor) and Federal Color (Sun Chemical's predecessor) entered the flushed color business. Most United States manufacturers of oil inks today use flushed colors. (Counihan 5525–28; CX 2012B).

227. The impact of flushed pigment technology is demonstrated by the fact that the five leading printing ink manufacturers in the United States today are in the pigment business, serving themselves and also serving the merchant market. These companies are Inmont, **[71]**owned by United Technologies Corporation; Sinclair and Valentine, owned by Wheelabrator-Frye Corporation; Sun Chemical; Borden Chemical; and Flint Ink. (Counihan 5527). In recent years, in response to inroads made by flushed colors in the ink and coatings applications, certain dry pigment producers have developed and

promoted easy-dispersing pigments (or ED pigments). F. 249–50, *infra.*

228. Although prior to the late 1940's only DuPont had manufactured phthalocyanines (a polycyclic organic pigment) in the United States, as that decade drew to a close American Cyanamid, Standard Ultramarine and Color Company, Imperial Color Company and Thomasset began producing phthalocyanine blue pigments. (Counihan 5528). In 1978, the United States producers of phthalocyanine pigments included Sun Chemical, DuPont, CPD, American Cyanamid, Sterling Drug/Hilton Davis, Hercules, Pope Chemical, Apollo Chemical and others. [***]

229. In 1955, Harshaw Chemical Company acquired the technology to disperse pigments in water. About this time, latex emulsion paints came into the market and Harshaw moved into this field. By this time, commercial forms of organic pigments in the United States included dry pigments, flushed pigments and water-based pigments. (Counihan 5529).

230. In 1957, Farbwerke Hoeschst AG, (one of the three successor companies of I. G. Farben, along with BASF AG and Bayer AG) acquired Carbic Color and Chemical Company and formed American Hoechst Company, Inc. Hoechst had a group of patented yellow organic pigments (called Hostaperms) and was able to sell them in the United States without paying the American Selling Price tariff. In addition, Hoechst had control over the raw materials needed to make these pigments. American Hoechst later constructed a manufacturing plant in Rhode Island to produce the Hostaperm yellows domestically. (Counihan 5533–35). These patents expired in the mid-70's.

231. Also in the late 1950's, Sandoz, a Swiss firm, acquired Fine Chemical Company, and Allied Chemical acquired Harmon Colors. (Counihan 5536). In the 1950's Tenneco acquired New York Color, manufacturer of pigments, and Berkshire Chemical, a manufacturer of dyes, and formed Tenneco Colors. (Counihan 5537).

232. In the 1960's, Hercules Corporation acquired Imperial Color and Chemical Company, and later sold its pigment business to CIBA-GEIGY in September 1979. (Counihan 5536, 5553).

233. During the 1960's, several new organic pigment firms entered the field. In 1964, Pope Chemical was formed to produce flushed colors and expanded into the standard pigments for oil inks, namely, Red Lake C, diarylide yellow, phthalocyanine blue and lithol rubine. (Counihan 5536–37). **[72]**

234. Also in 1964, Chemetron Corporation acquired the Standard Ultramarine and Color Company of Huntington, West Virginia, and

merged it with the Holland Color and Chemical Company to form Holland SUCO Chemical Company, which became the Pigments Division of Chemetron (CPD). (Counihan 5537).

235. In 1964, Magruder Color Company entered the flushed color field by acquiring Adco Color (Counihan 5536–37), and in 1980 purchased Indol, a manufacturer of diarylide yellow pigments. During the 1970's, Magruder has been the fastest growing pigment company in the United States. It moved into a large pigment manufacturing plant in New Jersey in 1977, thereafter purchased a phthalocyanine dispersion company in Chicago and built a plant in Puerto Rico to manufacture Red Lake C and rhodamine pigments. (Counihan 5555–56).

236. During the 1960's, Sun Chemical Company acquired Federal Color Laboratories and merged it with Ansbacher-Siegle to form the Sun Chemicals Pigment Division. Since the Federal Color acquisition, it has become the largest organic pigment manufacturer in the United States. (Counihan 5537–38).

237. In 1969, Apollo Color Company was formed to produce flushed colors for printing inks. Apollo manufactured the standard pigments for oil inks, namely, diarylide yellow, lithol rubine, Red Lake C and phthalocyanine blue. (Counihan 5538–39).

238. In about 1967, Japanese manufacturers began to import phthalocyanine crude into the United States. At that time, American Cyanamid, DuPont, Thomasset, Standard Ultramarine and Imperial were the only firms in the United States that manufactured phthalocyanine crude. The Japanese firms also taught their customers the techniques needed to finish the crude into phthalocyanine presscake for flushing and phthalocyanine dry pigment for resale. According to Mr. Counihan, the Japanese importers thus have placed four new firms in the phthalocyanine business: Apollo, Magruder, Sun Chemical and Pope Chemical. Phthalocyaninecrude imported from Japan is now thought to account for about one half of the available crude supply in the United States. Both BWC and BASF AG presently purchase phthalocyanine crude from Japan. The principal Japanese importers of phthalocyanine crude to the United States are Toyo Ink and Dainippon. (Counihan 5539–41).

239. In 1970, as a result of the CIBA-GEIGY merger, CIBA-GEIGY formed a pigment department in the Plastics and Additives Division, and in September, 1979, acquired the pigment business of Hercules Corporation. (Counihan 5542, 5553).

240. In 1972, Sherwin-Williams sold its pigment formulae and customer list, with the exception of alkali blue, to Sun, and otherwise left the pigment industry. (Counihan 5542). In 1973, General Aniline

and Film ("GAF") closed its Linden, New Jersey, plant [73]and left the pigment industry. (Counihan 5542–43). In 1980, American Cyanamid discontinued the manufacture of chrome pigments and sold its phthalocyanine pigment formulations and customer lists to Sun Chemical. (Counihan 5554).

241. Thus, the 1970's witnessed a major shift in ownership of domestic manufactures of organic pigments through acquisitions. As a result, at the end of the decade, four of the top seven firms in the organic pigment market were owned by large foreign chemical companies. These companies have now completed the long-sought transformation from importers of specialty pigments to full participants in the United States organic pigment market. (CX 1–2; 3946I; RX 2103A). F. 223–32, *supra.*

B. *Capacity Expansions and Areas Of Growth In The Organic Pigments Industry*

242. During the period 1969 to 1980, many of the major competitors in the organic pigments industry expanded their organic pigment production capacities. For example, Du Pont announced plans to build a new quinacridone facility in 1969 (Counihan 5539) and to double its phthalocyanine production in 1970. (CX 602Q; Counihan 5542). American Hoechst invested about [***] million in the new organic pigments facilities at Coventry, Rhode Island between 1970 and 1975 and proposes to spend another [***] million for expansion. (Geiss 2089–92). Similarly, American Cyanamid expanded its azo pigments plant in 1975. (Counihan 5543). CPD constructed a new phthalocyanine green facility at Huntington, established the necessary equipment for the production of perylenes and increased its azo production capacity at Holland, Michigan. (Long 5914–26, 5928–30). Sun Chemical spent $12 million to construct a new diarylide yellow production facility in Muskegon, Michigan. (Whittemore 1916). The new facility, which came on stream in December 1978, represented the first phase of a long-range plan involving the investment of over $30 million in organic pigments production. (Whittemore 1914, 1916; Counihan 5551). *See also* Giniger 7210.

243. Until the late 1970's, the demand for phthalocyanine pigments have generally exceeded the available supply. (CX 282B; 593C; 602S; 706J). A temporary over-supply of some phthalocyanine blue pigments existed in 1975. (CX 187II). The shortage of phthalocyanines arose as a result of the withdrawal of Sherwin-Williams and GAF from the market, a reduction in the available supply of phthalocyanine crude (much of which is imported from Japan), and increased demand in certain end-use segments. (CX 593C). By the

late 1970's, however, there existed a worldwide overcapacity caused, in part, by new phthalocyanine facilities constructed in Europe [***] (CX 1718; 1720; 3202I; 3224D) and small capacity expansions in the United States. (CX 3202I; 3216Y; 3846WWW; Geiss 2142). [74]

244. Although organic pigments is a mature industry, industry firms identified four areas of increased demand and growth. These include replacement of environmentally hazardous inorganic pigments, pigments for plastics, pigments for gravure printing systems and easily dispersing pigments. (CX 3101S; [***]).

245. Since the mid-1970's, the industry has witnessed an increasing growth in the demand for high-performance organic pigments and a concomitant need for development of advanced technology in order to maintain a competitive position in the market. [***] cited his firm's inability to produce pigments with high-performance characteristics as one of the reasons for [***] recent withdrawal from the organic pigment business. [***] testified, on the other hand, that one reason [***] stayed in the U.S. organic pigments market was its ability to develop and market the more sophisticated organic pigments which it had in its product line. [***] The trend to higher-performance pigments can be attributed, in part, to increased demand for technically advanced organic pigments to be used as replacements for inorganics and for use in plastics. (CX 2047G; 3004L; 3106II; 3218G; 3418C; 3607D; 3609I).

246. The replacement of environmentally hazardous inorganic pigments by organic pigments was caused by governmental regulations limiting the amount of lead in consumer products and the permissible level of lead or chrome in the workplace. (Smith 1387–89; Papillo 1807–08; Panush 2287–88). The paints and coatings end-use segment of the organic pigments market began converting from chromate inorganic pigments (such as chrome yellow, chrome green, and molybdate orange) in the early 1970s. (Schober 1676). By the mid-seventies, most of the automobile manufacturers (such as GM and Ford) and the companies that supply automotive coatings to them (such as Celanese, PPG, and Inmont) had switched to organic pigments in place of the chrome inorganics. (Schober 1671–72; Panush 2286; Papillo 1809). The primary organic pigments being used as chrome replacements are isoindolines, isoindolinones, and benzimidazolones, which are high-performance organic pigments. (Panush 2286–87; Smith 1390–91). Although the manufacturers of chrome and lead based inorganic pigments have modified some of their products, they have been unsuccessful in their attempts to regain the business lost to organic pigments. (Panush 2288–90; Schober 1677–78, 1733).

247. The plastics end-use segment of the industry is also considered to be an area of relatively rapid growth for the organic pigments business. (CX 3010J–M; 3946LL; Geiss 2078). The plastics sector generally consumes high-performance organic pigments because of their superior heat and bleed resistance. (Geiss 2078–79). [75]

248. The use of publication gravure inks is also increasing. (CX 3106HH; Stammen 2441). This growth is shown by Siegwerk's recent construction of a new printing ink facility in Iowa. (Stammen 2379–80). BASF's organic pigment assortment contains a large number of products that are particularly suited for gravure systems. (CX 956B; Hahn 4114).

249. One of the fastest growing product forms is easily dispersing ("ED") organic pigments. (CX 2047E; 3101S; 3418D; 3946(7)X). ED pigments are dry, powered organic pigments which contain a small amount [***] of a dispersing agent. (CX 3946(7)S, (7)W). The advantage of ED pigments is that a minimum amount of energy input (for milling, etc.) is required for the pigments to develop most of nearly all of their color strength in the medium in which they are dispersed. [***] Moreover, ED pigments can be applied in all end uses. [***]

250. ED pigments are a product development objective of the organic pigments industry, with the ultimate goal being a true "stir-in" pigment. (Bock dep. CX 5085BB; Counihan dep. CX 5087NN). The European companies—BASF, Hoechst, and CIBA-GEIGY—are the leaders in ED pigments. (CX 1958H; 3946(7)X; Bock dep. CX 5085CC; Geiss 10723–24; Malchick 3299). In the U.S., Sun Chemical, CPD, and Inmont have developed ED pigment products. (CX 3946(7)(x); Counihan dep. CX 5087MM, NN).

C. *The Significance Of Basic Research, Product Development And Applications Research In The Organic Pigments Industry*

251. Compared to the level of technological expertise required by the chemical industry generally, the level of expertise required to successfully compete in the organic pigments industry is above average. (Canon 12531–32; 12571).

252. In order to become a successful competitor in the organic pigments market, a company must make a commitment to research and development. (Schober 1665–66; Papillo 1787–88; Malchick 3319–20; Lipton 1603–04; Hahn dep. CX 5088AA–DD). A research and development program is important to the development of new pigment products, to the improvement or modification of existing products, to meet the changing needs of end users, and to expand a

firm's customer base and its sales to existing customers. (Lipton 1595; 1603–04; Papillo 1787–88; Geiss 2176–77; Panush 2249–51).

253. The level of research and development expenditures for the organic pigments industry exceeds that of the economy in general. **[76]**(Kamerschen 10949–50). The large competitors in the organic pigments market invest substantially greater sums of money in research and development than the smaller firms. (RA 144; CX 3035B; 3120; 3227A; 3414; 3822B; 3842; 3863; 3885; 3901B; 3911; 3932A).

254. Environmental regulations and work-place health restrictions have increased the importance of research and development in the organic pigments industry. (CX 3004L; 3009J; 3215C; 3218G; 3606T; 3607C; 3609I).

255. The organic pigments companies (including Du Pont, Sun, CIBA-GEIGY, Hoechst, BASF) distinguish basic research from product development as they relate to organic pigments. (CX 3515A; 3613A–B; Hahn dep. CX 5088M–P; Geiss 2068). Basic research involves the synthesis of new organic compounds. (Papillo 1789; Geiss 2068). Product development involves the development of new product forms or modification of existing products. (Papillo 1788–89; Malchick 3080–81; Hahn dep. CX 5088M; Geiss 2068; Lipton 1603–04).

256. Because organic pigments must be incorporated into a system for use in inks, paints, or plastics, each of which has its own applications technology and pigments requirements, a company must engage in considerable research in "applications technology" to be a substantial competitor in the organic pigments market. This involves the testing of pigments in different applications and alteration of pigmentary properties to make it suitable for use in an end-use area. Applications technology is an important element in the sale of organic pigments. (Papillo 1785–86; Malchick 2876–80; Counihan dep. CX 5087U).

257. The leading competitors in the organic pigments market have well defined research and development procedures. (CX 1076; 3515D–E; Smith 1422–36). The development of a product from its initial synthesis to commercial introduction generally involves several steps, including: initial experimental synthesis and preliminary testing; laboratory manufacture of a small quantity (about 100 grams) of the pigment and applications testing; pilot plant production and further testing (*e.g.,* toxicological tests); initial production trials and testing by selected customers; and establishment of final production procedures and commercial introduction. (CX 3115D–E; Papillo 1783–84; Smith 1422-36). Although a large variety of

compounds may be synthesized in the laboratory, relatively few of them become commercial products. (CX 3115D–E; Papillo 1783–84; Smith 1422–36; Bock 3452–53).

258. The time and expense required to develop a commercially acceptable pigment varies depending upon whether it is a new chromophore, an improvement of a pigment already in a company's product line, or a modification of a product in a competitor's line. (CX 3515B–D; Smith 1441–42). Generally, the development process requires a period of time ranging from several months to several [77] years. (Malchick 3334; Bock 3452–53; Smith 1436; 1439–42; Counihan dep. CX 5087 PP–RR).

259. Paul Papillo, Vice-President of CIBA-GEIGY Corporation, testified that the time required to move from synthesis to commercialization was 10–15 years for development of a new chemical type or chromophore, 5–8 years for modification of an existing specialty pigment, and 2–3 years for modification of an existing conventional or commodity organic pigment. (Papillo 1786–87; CX 3515 B–D). The costs associated with the development of a speciality organic pigment by CIBA-GEIGY were estimated to be about $3.5 million; for development of a conventional organic pigment, about $560,000. (CX 3515B (based on an exchange rate for 1978 of 56.283 cents per Swiss Franc); Papillo 1848–49; CX 3613A).

260. While Mr. Papillo testified that research and development was important to a firm such as CIBA-GEIGY, BASF or Sandoz (Tr. 1838), he also noted that the speciality pigments developed through this type of research were aimed at the high priced segment of the industry, principally for use in the automotive coatings end use. (Tr. 1881). He also testified that DuPont, the second-ranking firm in the U.S. organic pigment market, has not been active in new chemistry for pigments for some time. (Tr. 1888).

261. [***] attributed his company's position in the United States organic pigments market, in part, to the research and development program of its parent, [***] (Tr. 2138). He also testified that it is not necessary for an organic pigment company in the United States to be strong in research to be successful, citing Sun Chemical and Magruder as examples. (Tr. 2170).

262. Historically, both product patents and process patents have been used by organic pigments manufacturers to protect their production processes. (CX 3601B–H; Geiss 2069). Many of the patents associated with high-performance pigments have expired (Papillo 1796–97), although patents on some perylene pigments and benzimidazolones are still in effect. (Papillo 1797; Geiss 2149; CX 3601 B–H). After the expiration of a patent, a duplication of the product by a

competitor may require specialized equipment, intermediates, and/or process knowledge not readily available to all industry participants. (Papillo 1799–1800). Competitors continue to regard patent activity as a predictor of research capability and competitive potential. (CX 3215B–E; Papillo 1814–15).

263. However, a number of successful organic pigment manufacturers in the United States have engaged in little or no research in the traditional sense. For example, [***] testified that [***] had never successfully developed a new pigment molecule and placed it in the [78]market place, but that [***] had successfully developed pigment products to the stage that they were competitive with pigments sold by other producers. He testified that the industry had seen some technical improvements, but no major technical breakthroughs. [***] also testified that [***] typically focused on the development of existing structures, and that even if a product modification was patented, it was possible to circumvent the patented process. [***]

264. Mr. Weissglass of Magruder, a fast-growing firm, testified that Magruder's research and development budget was approximately [***].

265. Mr. Giniger of Pope, a small but fast-growing firm, testified that Pope's research and development effort is [***] (Tr. 7209).

266. Mr. Counihan, former President of CPD, observed that small flushed pigments manufacturers with a low level of research and development are able to make money while companies with large research facilities have difficulty making money. (Tr. 5561). Mr. Counihan testified that the term research and development as used by CPD essentially described product development, namely CPD would attempt to develop an already existing pigment type to a quality which would be attractive in the marketplace. CPD attempted to introduce pigments which were new to it, but which were already sold by other manufacturers. In any event, it met with little commercial success. (Tr. 5660–64).

267. Mr. Panush of Celanese Corporation testified that, at least in the automotive coatings end use, it is generally important for organic pigments manufacturers to have a research and development capability. (Tr. 2249). This is consistent with the testimony of Mr. Papillo of CIBA-GEIGY, who testified that the pigments developed for automotive end users are high-priced and that automotive end use customers tend to be less concerned with price than other end use customers. (Tr. 1881).

268. [***] stated that one of the factors that led [***] to withdraw from the organic pigments market was the need to develop high-performance organic pigments to compete with the products of

companies like BASF, Hoechst, and CIBA-GEIGY, which expended substantially greater funds on product development. [***] **[79]**

269. Dr. Erich Stoeckl, head of Pigment Production at BASF AG, testified that many major pigments manufacturers have switched the emphasis of their research from new product research to cost reduction and environmental regulatory compliance, and that the development of new compounds has "practically come to a standstill." (Tr. 5056). Dr. Stoeckl further testified that he foresees no major new developments in organic pigments or production in the 1980's. (Tr. 5057).

270. Dr. Gustav Bock who heads BASF's applications technology testified that customers are not willing to pay the additional cost involved in developing new pigments and that, in his opinion, there will not be any major technological breakthroughs in the organic pigments industry in the 1980's. (Tr. 3400, 3498).

271. Dr. Erwin Hahn, director of pigment research at BASF AG, testified that the [***] and other pigments introduced in the last few years by BWC were not technological breakthroughs. (Tr. 4137).

272. [***] its own research activities also noted that increased emphasis on cost reduction and the development of environmentally more acceptable products leaves less room for research into new pigments. (CX 1087A).

273. With regard to phthalocyanines, [***] testified that phthalocyanines in general do not require a higher level of technology than other organic pigments. In fact, phthalocyanine blue does not require as high a level of technology as the average organic pigment. [***]

274. A study conducted by [***] in 1978 (CX 1958) found that: [***] Also, a 1978 [***] study of the organic pigments industry concluded that [***] (CX 3007I). **[80]**

275. Although the discovery of new pigment chromophores is rare, the few developments of new pigment products in the past 25 years have come from the major organic pigments manufacturers, including BASF AG (isoindolines and quinophthalones), CIBA-GEIGY (quinophthalones, azo methines, and isoindolinones), Hoechst AG (benzimidazolone), Harmon (perylenes), Du Pont (quinacridones), and American Cyanamid (BON Red Homologue). (Smith 1357–63). In the last 10 years, the significant technological advancements have been made by BASF, CIBA-GEIGY, and Hoechst. (Papillo 1838–38A; Geiss 2073–74).

D. *Marketing And Technical Service*

276. Organic pigments are largely heterogenous and strongly end-use oriented, and as such require a marketing force which

understands not only the technical performance characteristics of particular pigment products but also the technical requirements of the pigment user. And technical service provided the user is an integral part of organic pigment marketing. (Geiss 2067; Parker 4949–50, 4963; CX 2042PP).

277. An organic pigment manufacturer's technical service department (as distinguished from research and development) is generally responsible for evaluation of competitive products as well as products developed by its own research and development laboratories, quality control, and solving technical problems and providing technical assistance to end users. (Counihan 5746–47; Geiss 2071). The level of technical service provided by an organic pigments manufacturer is important to end users because of its role in developing and modifying pigment products for specific applications. (Stammen 2426–27; Panush 2211–14; Malchick 2876–80).

278. An organic pigments manufacturer must have a direct sales force (as opposed to manufacturer's representatives) (Counihan 5786–89) which has received substantial technical training. (Schober 1646–47). A well-established organic pigments sales organization is difficult and time consuming to develop. (CX 960D; Counihan 5667–68; Counihan dep. CX 5087FFFF–GGGG).

279. In order to be a successful competitor in the organic pigments industry, a company must obtain product approvals from end users of its pigments. Product approvals are a prerequisite to sales. (Schober 1753–54). Generally speaking, an end user will not buy a pigment product until he has tested that product in the formulation or application in which it will be used. (Papillo 1788; Aschner 5390–91). The time required to obtain product approval ranges from a few months (for some ink uses) to several years (for automotive coatings uses). (Papillo 1783–95; Schober 1655–57; Panush 2237). In the automotive coatings segment of the market, end users will not test pigment products unless the supplier has a demonstrated [81]technical competence and service capability. (Papillo 1832–33; Panush 2209–13). The complexity and cost of reformulating a pigment system precludes easy substitution of established pigments. (CX 3223I). Once a reputation for quality and service is developed, it is hard to dislodge established pigment suppliers. (CX 204C; 3008E).

E. *The Scope Of Product Line*

280. Organic pigment manufacturers that can offer their customers a wide range of products (chemical types in a variety of forms, *i.e.*, dry, flushed, dispersed) have a competitive advantage over producers whose product lines are limited. (Schober 1740; Geiss 2177; CX 3119;

3846 (5)K; 3946V; 3613A). A producer of a broad line of pigments is a more viable supplier than companies that specialize in a limited field of application or type of pigment, other things being equal. (Schober 1752–53; Counihan 5750–51; Weissglass 2490; Aschner 5441–42).

281. The major competitors in the organic pigments industry offer a wider variety of pigment types and forms for more end-use applications than the smaller competitors. (Stipulation dated January 4, 1982; Whittemore 1911–12; Geiss 2056, 10,698–99).

282. Organic pigments manufacturers sometimes purchase organic pigments from competitors and resell them to their customers in the same or modified form. (Geiss 2094–95; Weissglass 2490; Aschner 5367–68). One reason for this practice is to fill out or broaden its product line. (CX 187J; 769TTT; Weissglass 2490; Aschner 5367–68, 5441–42). CPD, for example, purchased and resold Pigment Green 36, the only major phthalocyanine blue/green pigment which it did not produce. (CX 779F–G).

F. *Organic Pigment Prices And Price Changes*

283. Historically, organic pigment prices have tended to rise about 10% in two-year cycles. In 1974, however, inflation resulted in a 30% across-the-board price increase. (CX 203D). From 1975 through 1977, the average price per pound of organic pigment sold in the merchant market (excluding captive consumption) increased at an annual rate of about 7% each year (11% from 1974 to 1975 and 1975 to 1976, but negative 2% from 1976 to 1977). (CX 1801A).

284. The pace of price rises for organic pigments increased beginning in late 1977 and continuing into 1980. In August 1977, for example [***] announced identical price inceases for P.R. 48 (Red 2B), which were followed by [***] (CX 233B), **[82]**but did not hold. The following month, [***] increased its price for Red 2B to the same level from which the other competitors had attempted the increase. (CX 235B). At the same time, [***] increased their prices for phthalocyanine blue pigments by 5%. (CX 235B).

285. In 1978, the major organic pigments producers increased prices twice. In April 1978, [***] increased prices across the board. (CX 255B). Again, in August 1978, [***] increased their prices for Pigment Red 48 and, effective September 1978, for phthalocyanines. (CX 257D).

286. In April 1979, [***] increased their prices for organic pigments (CX 275A; 6013), and the prices held. (CX 282B; [***]). In March 1980, when BWC announced a new round of price increases, Sun, Du Pont, American Cyanamid, Hilton-Davis, and Magruder indicated that they would follow. (CX 290D).

287. Certain companies appear to have established themselves as

price leaders in certain product types. American Cyanamid, for example, was considered to be the price leader for barium and calcium lithol red (P. R. 49:1 and 49:2) pigments. (McKenzie 6943–44; CX 3415B). [***] is the price leader for quinacridones. (CX 3009M). Harmon and BWC are price leaders for certain organic pigments sold to the automotive coatings end-use segment of the market. (Aschner 5491–93; CX 240B). However, the large number of products, many of which are heterogenous, in the organic pigments market and the complex product and pricing structure of the industry are not conducive to price coordination among industry firms. (Glassman 8769–81; Adelman 10084–90). Dr. Kamerschen, complaint counsel's expert witness, however, expresed a view that the organic pigments industry members nevertheless had the ability to coordinate their pricing. (Kamerschen 10,975–81).

288. [***] testified that prices in the organic pigments business have not kept up with inflation. He stated that when [***] attempted to increase prices to bring them into line with costs it was forced by price competition to retreat to former levels and that it was the small competitors that were particularly effective price competitors. [***]

289. Mr. Allan Weissglass, President of Magruder, testified that considerable price cutting occurs in the organic pigment industry. (Weissglass 2525).

290. Dr. Kohnle, of BWC testified that there are many sales off list price, and that discounts differed from one product to another. (Kohnle 4501–03). *See also* Kohnle Deposition Testimony. (CX 5091L–K). **[83]**

291. Mr. Counihan, former president of CPD, testified that one of the twin problems faced by CPD during the time he was its president "was the intensive pricing pressure by the competition." (Counihan 5690). He further stated that although there are price lists for organic pigments, "[n]othing is being sold at the list price. Everything is under the market." (Counihan 5691).

292. Dr. Canon, former vice-president of Harshaw Chemical, testified that the phthalocyanine prices have been chaotic. (Canon 12,520).

293. Mr. Aschner, former marketing manager of BWC's PIC department, testified that selling below list prices was "very common" particularly since competitors registered American Selling Prices higher than actual market prices. (Aschner 5335) He stated that there was no such thing as "a fixed price and a stable market," (Aschner 5336); [***] He observed that there was a substantial amount of off-list selling of organic pigments (Aschner 5407–11) and

that "list prices are rarely what customers pay for any toner." (Aschner 5338).

294. A number of Commission Exhibits in evidence tend to confirm the conclusion that the organic pigments industry is price competitive.

295. [***] document assessing the diarylide yellow "market" notes that "the current published book prices are at least 10–15% higher than the actual market selling prices." (CX 3009M). Also an [***] Semi-Annual Report for 1976 commented that there were pricing battles with respect to different pigments including 3B Reds, lithol rubines and phthalo blues. (RX 6003J).

296. [***] report prepared for [***] in December 1979 commented that green shade phthalocyanine, "although listing at a higher price than red shade, actually is sold at a lower price because competition is keener." (CX 3023Q).

297. The [***] Long Range Plan (CX 3105), [***] noted certain companies that competed on the basis of pricing, including Montedison (CX 3105D), American Hoechst (CX 3105F), Borden (CX 3105I), Du Pont (CX 3105L), Industrial Color (CX 3105S), Magruder (CX 3105U), Pope Chemical (CX 3105V), Roma (CX 3105X) and Uhlich (CX 3105Y). Similar characterizations of industry members are found [***] **[84]**

298. The [***] Long Range Plan noted that the ink industry, [***] is highly price competitive, a factor which had held [***] to periods of small or negative sales increases during the late 1970's. (CX 2047E–G).

G. *Vertical Integration*

298–A. Organic pigments manufacturers which also produce intermediates (from which organic pigments are manufactured) have an advantage over those which do not. (CX 3215C; 3846(5)K–(5)L; 3946JJ; 3989J). An organic pigments manufacturer that produces a substantial amount of its required intermediates can establish a strong market position in the finished pigments which are produced from those intermediates. (CX 2052 (CPD - C-Amine based products); CX 3415A–B (American Cyanamid - lithol reds)), have a cost advantage over unintegrated competitors, and a strategic advantage in having a secure source of raw material supply. (Papillo 1812–13; Counihan 5736–37; Counihan dep. CX 5087SS–WW; Kohnle dep. CX 5090EE–HH). A number of foreign and domestic organic pigments manufacturers produce varying amounts of their requirements for some intermediates. [***]

298–B. A few organic pigment producers are forward-integrated into end uses, such as industrial and architectural coatings and printing inks. *See* F. 227, *supra;* F. 522, 527, *infra.* Organic pigment suppliers generally do not view such captive consumption as their sales prospects. (Schober 1660–61).

298–C. The relataively limited number of intermediates suppliers can make the availability of raw materials sometimes unreliable. (CX 3218J; Canon 12,553–54). In 1974, when a severe shortage of raw materials developed (Weissglass 2527), integrated manufacturers were able to comand premium prices for their organic pigments. (CX 2045A; 3223D; Canon 12,549–50; Counihan 5672–73).

H. *Market Intelligence*

298–D. The major organic pigments manufacturers regularly monitor the pricing changes, capacity expansions, and product introduction attempts of their competitors. (Schober 1661–62; Counihan 5559–60; Bock 3429–30). *Also see* CX 702H; 704C–G, L–N; 705A; 726A; 3017; 3018; 3113; 3204. Market intelligence is developed through contacts with competing salesmen (Schober 1662) and customers. (CX 704P, AA, FF–GG, LL). Competitors also maintain contacts through the trade association (DCMA) (Counihan 5559–60), visits to competitors' plants and other meetings. *See* CX 704V–Z, CC–DD; 907, 919, 951; 3003F; 3017–18; 321D–G; 3204C; 3205; 3408; 3409A; RX 6102A–B. **[85]**

I. *Resales of Organic Pigments*

298–E. Organic pigments manufacturers sometimes purchase some organic pigments from competitors for resale in the same or modified form to end users. (Papillo 1809–11; Aschner 5367–68, 5419–20; Weissglass 2489). Resales can be profitable (Weissglass 2490), and can make a contribution to a manufacturer's fixed costs. (Geiss 2095). A competitor will also resell organic pigments in order to fill out or broaden its product line. (Weissglass 2490; Aschner 5367–68, 5441–42).

298–F. A manufacturer may sell pigments to competitors for resale in order to increase his products' market penetration (Papillo 1810–11) and to develop a source for products which it does not manufacture but may want to buy for resale. (Aschner 5471–73). A manufacturer may also sell a competitor a product for resale in order to keep the competitor from producing that pigment himself. (CX 719B; 1334A; 3205A). The prices of pigment products sold to competitors are generally at a discount of between 10–20%. (Aschner 5421–22).

298–G. BWC and CPD sold significant quantities of organic pigments to others for resale (CX 1821; 1842G; 2029) and were active resellers of organic pigments produced by others. (CX 9(5)G–(5)N).

298–H. [***] purchased phthalocyanine pigments from BASF AG in Europe, imported them into the United States through Amercian Hoechst and sold them [***] (Aschner 5422–23; Kohnle dep. CX 636A; 638A; 5090Y–Z). [***] resold phthalocyanine pigments purchased from BASF/BWC for a period of two years. (CX 719A; 1334A). [***] believed that by selling to such "co-manufacturers," it could "track" the sales of the products and eventually obtain the business directly and also deter the co-manufacturer from building its own production facilities. (CX 212D; 719).

J. *Government Regulation And Competition In The Organic Pigments Industry*

298–I. Organic pigments manufacturers faced an increasing number of environmental and work-place safety regulations throughout the 1970s. (CX 1958B, D, H–J; Counihan 5650–52). Most of the regulations which affect the organic pigments industry are promulgated under the Occupational Safety and Health Act and the Toxic Substances Control Act. The latter is enforced by the Environmental Protection Agency and requires registration by all chemical companies, including organic pigments manufacturers. (Weissglass 2533). **[86]**

298–J. The regulations which have had the most pronounced impact on the organic pigments industry relate to the use, handling, and treatment of dichlorobenzidine (DCB), which is used in the manufacture of diarylide yellow organic pigments, and polychlorinated biphenyl (PCB), which is a by-product associated with the production of diarylide yellow and phthalocyanine pigments. (CX 654D–E; 704M–N; 766; 3977M, U; Smith 1364–65). These materials must be stored separately and disposed of through primary and secondary waste treatment facilities. (Counihan dep. CX 5087PPP–QQQ; CX 3305L–O). The Dry Color Manufacturers Association (DCMA) established in its Ecology Committee special subcommittees responsible for analyzing the effect of government regulations on the organic pigments business and representing the industry's viewpoint before the appropriate regulatory agencies. (Counihan 5650–52).

298–K. One result of the government's environmental and occupational safety regulations has been to increase the costs borne by organic pigments manufacturers. (CX 3009I–K; 3024D; 3107KK; 3218D; 3219D; 3946K; 3989I; Mecke 4174–75). Some have predicted that the increased costs may hasten the exit of firms out of organic pigments production and discourage new entry. (CX 2047G; 3101T; 3606T; 3607C; Counihan dep. CX 5087PPP–RRR). However, the organic pigments industry has successfully adapted to the increasing number of regulations and the burdens they impose (Weissglass

2524–25), by adjusting production plans and modifying products and processes. Magruder, for example, considered and rejected manufacturing diarylide yellow because of the regulatory costs associated with constructing a new facility and acquired Indol, which produced diarylides. (Weissglass 2494–95). [***] as the location for a new diarylide yellow pigments facility in part because of the relatively low waste treatment costs associated with that site. (CX 3109H). [***] made significant investments to create a "PCB-free" process for phthalocyanine crude, suffering a temporary decrease in the profitability of its phthalo business. (CX 3203C). [***] has experienced significantly increased costs as a result of new investments in waste treatment facilities. (CX 3202N).

K. *Significance Of Imports Of Organic Pigments And Competition*

298–L. The leading competitors in the United States organic pigments industry view the market for organic pigments from a worldwide perspective. (Lipton 1597–98, 1605; Whittemore 1941; Nicoll 10,673–74; McKenzie 12,179).

298–M. The dollar value of organic pigments imported into the United States increased more than six-fold from 1968 to 1977 and the ratio of imports to apparent consumption (United States production plus imports less exports) of organic pigments in the United States [87]has tripled. (CX 3986G). The following table illustrates the yearly increases in the value of organic pigments imported and consumed in the United States:

Year	Value of Imports ($000)	Ratio of Imports to Apparent U.S. Consumption
1968	4,940	3.6%
1969	8,783	5.5
1970	10,622	7.2
1971	12,966	8.0
1972	12,017	6.6
1973	16,647	8.2
1974	27,305	10.3
1975	20,278	9.5
1976	32,346	10.1
1977	36,437	11.5

(CX 3986G; 3989E).

298–N. During the period 1968 through 1977, more than 75% of the organic pigments imported into the United States (on a dollar value basis) were produced in West Germany and Switzerland. (CX 3986F; 3989E). The following table illustrates the dollar value and percentage (in relation to total imports) of organic pigments imported from West Germany and Switzerland:

	Imports From W. Germany		Imports From Switzerland	
Year	Value ($000)	% Of All Imports	Value ($000)	% Of All Imports
1968	2,125	43	2,410	49
1969	4,095	47	3,883	44
1970	4,659	44	4,825	45
1971	6,302	49	5,624	43
1972	4,888	41	5,518	46
1973	7,206	43	6,003	36
1974	12,553	46	9,179	34
1975	8,281	41	6,303	31
1976	13,488	42	12,618	39
1977	16,246	45	[***]	[***]

(CX 3986F; 3989E).

298–O. CIBA-GEIGY of Switzerland has been the single largest producer of organic pigments imported into the United States. And, Hoechst AG, Bayer AG, and BASF AG, all off-shoots of I.G. Farben, are the other three principal producers of organic pigments imported into the United States. (CX 3801K; Krause 978–79; Stipulation dated January 4, 1982). [88]

298–P. Because of the continuing increase in organic pigment imports, the major domestic manufacturers pay close attention to the activities of the leading foreign producers. (Whittemore 1941; Papillo 1815–17; Geiss 2072–73; McKenzie 12,179). The DCMA obtains for its members import data from the Bureau of the Census. Sun Chemical, the top-ranking firm in the United States organic pigments market, routinely tests organic pigments offered for sale in Europe.

298–Q. The dramatic increase in the level of organic pigment imports in the 1970s was in part the result of a significant reduction in the tariff negotiated in 1967 (at the so-called Kennedy Round) and phased in over a five-year period. (Alsager 3757–58; Counihan dep. CX 5087DDDD). As of 1972, a two-tiered tariff system was in effect, under which an imported organic pigment that had a competitive counterpart in this country was assessed a duty of 20% of the "American selling price" (ASP) of the domestic product. (Alsager dep. CX 5083EE). The ASP was based upon prices of domestic products registered with the Bureau of Customs. (CX 3410–11). If the imported product had no competitive counterpart in the United States, then the duty was determined by applying a formula to the product's FOB price. The tariff on such "non-competitive" products generally amounted to about 15%. (Geiss 10,718).

298–R. The tariff on organic pigments was radically revised in 1980. (CX 1230–31; 1233; 1907M–N; 3028). The ASP formula was replaced by a formula under which so-called "competitive products" are assessed a duty equal to 31.3% of their "transaction value" (similar to FOB price) and "non-competitive products" a tariff equal to 20.4% of their transaction value. The applicable tariff rates will decrease by an equal amount each year for eight years until they reach 20% on competitive products and 8.3% on non-competitive products. (CX 1233A). When the tariff reductions are fully implemented in 1987, the duty applied to imported organic pigments will have decreased 36% from its 1979 level. (CX 1233A; Alsager dep. CX 5083HH–II).

298–S. During the recent tariff negotiations, the organic pigments industry vigorously opposed a tariff reduction for fear that it might lead to another substantial rise in organic pigment imports. (Alsager dep. CX 5083AA, CC–DD, JJ–KK; 3219A–U; 3973B–C). The tariff reductions that began in 1980 can be expected to increase the level of imports of organic pigments in the future. (CX 2047E; 3846XXX–ZZZ; Geiss 10,719–20).

298–T. To the extent that the United States organic pigment market becomes more accessible to foreign producers and imports remain uncontrolled by leading domestic suppliers of organic pigments, imports can have a moderating effect on the organic pigment industry in the United States. [89]

V. EFFECTS OF THE CHALLENGED ACQUISITION

A. *Chemetron Corporation Pigment Division (CDP) And Its Acquisition By BWC*

299. CPD, a division of Chemetron Corporation, was formed by the combination of the Holland Color and Chemical Company, located in Holland, Michigan, and acquired in 1944 by National Cylinder Gas (later to become Chemetron Corporation) and Standard Ultramarine and Color Company, located in Huntington, West Virginia, and acquired by Chemetron in 1964. (Counihan 5563–65).

300. On November 30, 1977, Chemetron Corporation was acquired by Allegheny Ludlum Industries, Inc. ("ALI"). (Sweeney 7370). At the time or shortly thereafter, ALI informed Chemetron Pigment Division (CPD) of its intention to sell CPD and to cut CPD's budget to a subsistence level. (Counihan dep. CX 5087K–M; Sweeney 7372).

301. Several companies expressed interest in buying CPD, includ-

ing CIBA-GEIGY, Rhinechem Corporation (Bayer/Harmon), BASF (BWC), Dainippon, and Sandoz. (Sweeney 7371–72; Counihan dep. CX 5087M). [***] (RA 123). Rhinechem's proposed acquisition of CPD was enjoined on October 20, 1978, by the United States District Court for the Northern District of Illinois. (RA 126; *FTC v. Rhinechem Corp.,* 459 F.Supp. 785 (N.D. Ill. 1978)). CPD once again had several serious suitors, including BASF (BWC), Sandoz, and Dainippon. (Sweeney 7375–77). On November 17, 1978, ALI, Chemetron Corporation, and BWC executed a purchase agreement for the sale of CPD's assets to BWC [***] (RA 127). The acquisition was consummated on March 23, 1979. (RA 128).

(1) *CPD's Production And Sale Of Organic Pigments*

302. From 1972 to 1978, CPD's sales of organic pigments (dry toner basis) were:

1972	$13.66 million
1973	21.81 million
1974	29.31 million
1975	23.91 million
1976	33.72 million
[***]	[***]
[***]	[***] [90]

(CX 2 (1978); 1801A (1972–1977)). Except for the industry-wide recession in 1975, CPD's sales grew steadily [***] between 1972 and 1978. (CX 1839U).

303. CPD's exports of organic pigments also grew before the acquisition. Exports nearly doubled between 1977 and 1978, [***] (CX 2; 9LLL, UUU).

304. Dr. Malchick, General Manager of CPD/BWC, characterized CPD as "one of the broadest line manufacturers of pigments" (Malchick 2821–22), producing "a broad range of organic pigments for a broad range of uses. . . ." (Malchick 2861). Covering the entire spectrum of colors (CX 1839O), CPD's organic pigments included diarylide yellows, hansa yellows, dinitraniline orange, pyrazalone orange, toluidine red, permanent red 2B, lithol red, BON reds, red lake C, lithol rubine, BON maroon, rhodamine pigments, perylenes, methyl violets, carbazole dioxazine, phthalocyanine blues and greens, and alkali blue. (CX 779F; Stipulation dated January 4, 1982). In all, CPD sold [***] different types of organic pigments ([***] which it produced, plus [***] which it resold). (CX 779A, F–G).

304A. CPD sold several of its products under tradenames, including:

CPD Trade Name	Chemical Type	C.I. Name
MACATAWA Red	BON Red (calcium)	Pigment Red 52:1
MOLORA Red	BON Red (manganese)	Pigment Red 52:2
SAUGATUCK Red	—	Pigment Orange 46
AZALEAN "B"	—	Pigment Red 200

(CX 779F).

305. A substantial portion of CPD's sales of organic pigments were red, blue, and yellow pigments. (CX 1813; 1839W). [***] (CX 779F; 3987J).

306. CPD's blue pigments accounted for about [***] of all organic blues produced. (CX 1808). CPD sold [***] of all alkali blue in the United States, and was a major worldwide participant as well. (CX 966C; 1843D; Muench 3870). In addition, CPD produced a full line of phthalo blues and had significant sales positions in each type: Pigment Blue 15:0 (5%); 15:1 (14%); 15:2 (43%); 15:3 (15%); and 15:4 (19%). (CX 779F). **[91]**

307. CPD was also a major producer of diarylide yellows in flushed form. CPD sold [***] of all diarylide yellow pigments (dry and flushed combined), and [***] of all flushed diarylide yellows. (CX 1801O). CPD also manufactured phthalo green (Pigment Green).

308. CPD sold its organic pigments mostly in flushed form. It also sold dry pigments, presscake, and other dispersions. (CX 1839O; 2036A). Sales of flushed colors were approximately [***] (CX 1818).

309. CPD's pigments were sold primarily to the printing ink industry, although sales were also made to coatings, and plastics industries. (CX 960F; 2029; 2036A). In 1978, CPD's dollar sales (as-is basis) of organic pigment products were divided among the major end-use industries as follows:

Printing Inks	[***]
Coatings	[***]
Plastics	[***]
To Other Firm For Resale	[***]
Total	[***]

(Source: CX 1821).

310. CPD was a major supplier of organic pigment products (mostly in flushed form) to the ink industry, accounting for [***] of all organic pigments used in inks. (CX 2047I, M). Of CPD's sales (as-is basis, dollars) to the ink industry, [***] were in flushed form, [***] dry pigments, and [***] were presscakes and other product forms. (CX 1816A). Sales to the coatings and plastics industries were [***] dry pigments, [***] flushed and pre-dispersed pastes, [***] presscake and related forms, and [***] in other forms. (CX 1822A).

311. CPD was the [***] producer of flushed color, [***] (CX 1815). [***] considered CPD to be a strong competitor in [***] (Whittemore 1944–46).

312. At the time of the acquisition, CPD produced two important intermediates, phthalocyanine crude and C-Amine. (CX 2042T; Counihan dep. CX 5087A, WW–XX, ZZ). Phthalocyaninecrude is the starting material for all phthalocyanine blue and green pigments (CX 2052S), and C-Amine is used in the production of several red and orange azo pigments. (CX 2052L). [***] **[92]**

313. At the time of the acquisition, the major domestic manufacturers of phthalo crude were [***] (CX 3–7; 602P–Q; 3216Y; 3846NNN, PPP). Other phthalo producers made their pigments from crude imported from Japan. (CX 593C; 3846PPP).

314. Before the acquisition, CPD was largely self-sufficient in phthalo crude, and also sold it in the merchant market. (CX 2042T; 3216Y). Since the acquisition, however, crude production at the Holland and Huntington plants has ceased. (Malchick 3157). BWC, like many others, now uses the low-priced phthalo crude imported from Japan. (Counihan 5636).

315. CPD was [***] producer of C-Amine (CX 2052N), an important intermediate used in the production of azo pigments. (CX 2052L). The following organic pigments are dependent on C-Amine as an intermediate:

C.I. Name	Pigment Name	CPD Product Name
Pigment Red 53:1	Red lake C (barium)	—
Pigment Red 52:1	BON red (calcium)	MACATAWA Red
Pigment Red 52:2	BON red (manganese)	MOLORA Red
Pigment Orange 46	—	SAUGATUCK Red
Pigment Red 200	—	AZALEAN "B"
—	—	MICHIGAN Red

(CX 1839Q; 2052L).

316. The only other domestic producer of C-Amine was [***] and the only other seller of C-Amine in the merchant market was a Korean importer. (Counihan dep. CX 5087YY). [***] (Counihan 5736–38).

317. CPD manufactured an entire family of azo pigments based on C-Amine and captured a leading sales position for such pigments:

Pigment	CPD Share of U.S. Sales (1978)
Red Lake C	[***]
MACATAWA Red (BON red 52:1)	[***]
MOLORA Red (BON red 52:2)	[***]
SAUGATUCK Red (Pigment Orange 46)	[***]

Pigment	CPD Share of U.S. Sales (1978)
AZALEAN "B" (Pigment Red 200)	[***]
MICHIGAN Red	[***]

(CX 1839Q). [93]

318. CPD's business was heavily dependent on sales to the printing ink industry, primarily in the form of flushed and predispersed color. (CX 2047D). A breakdown of sales in the years before the acquisition shows that sales to the ink industry accounted for [***] of CPD's total sales in 1976 (CX 2049D), [***] of total sales in 1977 (CX 2031A), and [***] of total sales in 1978 (CX 1821).

319. Mr. Whittemore of Sun testified that he considered CPD to be a major competitor in flushed colors, but that he did not consider it to be a particularly significant factor in dry colors. (Tr. 1944–45). [***] *Also see* Malchick 3050–54.

320. Mr. Papillo of CIBA-GEIGY testified that he did not consider CPD to be an active supplier of either specialty pigments or phthalocyanines to the automotive coatings end use, even though he was aware that CPD manufactured phthalocyanine blues and greens for the printing ink industry. (Tr. 1867).

321. Mr. Geiss of American Hoechst testified that CPD was largely a manufacturer of flushed color for the printing ink industry, and that with the exception of a limited purpose Yellow HR (suitable for packaging gravure ink applications) developed several years after the prototype product of American Hoechst had come off patent, CPD did not succeed in making any significant developments in the organic pigments field in the 1970's. (Tr. 2162).

322. Mr. Counihan, former president of CPD, testified that CPD's sales were primarily to the printing ink end use industry, including flushed pigments such as azos, phthalocyanine blue and other hues used by the oil ink industry. (Tr. 5635–36). Prior to its acquisition, CPD manufactured low to medium price pigments, such as diarylide yellow, lithol rubine, phthalocyanine blue, permanent Red 2B and alkali blue, but did not manufacture high technology pigments despite several efforts to develop the ability to manufacture such pigments. (Counihan 5638–41).

(2) *CPD's Research And Development*

323. CPD had a growing research and development program. (CX 2005H–X; 2054; 2056–71; Malchick 3301–02). [***] [94][***] During the same period, a Graphic Arts Testing Center was established at the Holland plant in order to test and demonstrate its organic pigment products in an actual performance setting. (CX 2008; Malchick 3303). CPD also constructed a new pilot plant at Holland in

1975 and acquired the ability to explore more complicated processes. Projects tested at the pilot plant included the chlorination of phthalo greens (a process later installed at CPD), and the development of a kerosene-based process to manufacture phthalo crude. (CX 654B, H; Malchick 2827–28, 3302–04; Long 5932–35).

324. CPD's research and development department's main function was product development, which included improvement of CPD's existing products as well as development of counter-offerings to competitor's products. Two other important functions of the department were to reduce manufacturing costs and to develop new process technologies for the production of [***] pigments. (Malchick 3061–62).

325. The research and development department of CPD was divided into two sections, one for pigment dispersions and the other for the chemistry and pigment formation. The latter section had separate research groups for phthalocyanines, azo reds, azo yellows, high-performance pigments, and pigment intermediates and process. (CX 2005H–V; Malchick 3056–57).

326. Among the chemical types that CPD successfully introduced, beginning in 1974, were dinitraniline orange, BON maroon, perylene red, AZALEAN "B", diarylide yellow AAMX (Pigment Yellow 13), and Pigment Yellow 83 (HR Yellow). (CX 2024; Geiss 2080–85; Malchick 3346–48). Perylene red is a "high technology" pigment. In 1977, CPD successfully developed Pigment Yellow 83, a counter-offering to American Hoechst's HR Yellow which came off patent in 1973. Although a number of small organic pigment producers in the United States, including Roma Chemical, MaGruder, Galaxie and Inmont, were able to duplicate and make counter-offerings to Hoechst's HR Yellow earlier than CPD and Sun Chemical, CPD's Pigment Yellow 83 (a resinated product) had performance properties matching or surpassing American Hoechst's and took some packaging ink business away from American Hoechst. (CX 3003B; 3030B; Geiss 2080–85). CPD was also successful in producing several types of Pigment Yellow 74, including one with high lightfastness. (Malchick 3283–84). These "Luna" yellows were developed to compete with DuPont's "Dalamar" yellows and were introduced into the market with a fair amount of success. (Counihan 5643–44).

327. Mr. Counihan, former president of CPD, testified that CPD's laboratory was not a traditional research laboratory but was rather a product development laboratory with little chance of developing complex pigments. (Tr. 5704–05). The real purpose of the laboratory was product development. In addition, by having the research **[95]**

personnel stationed in the production facility, CPD was able to solve the continuing quality problems caused by old and rundown production facilities. (Counihan 5705).

328. Sun Chemical, the top-ranking firm in the market, did not consider CPD as an innovator, although CPD had a good ability to match competitive products within a reasonable time after they were introduced. Mr. Whittemore of Sun characterized CPD's research efforts as a lot of Ph.D's and no output, and testified that Sun "was constantly surprised at the size of their [CPD's] effort and how little came of it." (Whittemore 1945, 1994).

329. [***] testified that "from our selfish point of view," [***] CPD was not strong in research. [***] held CPD's marketing and technical support staff "in low esteem." *Id.* He further testified that prior to the acquisition, CPD did not compete for the [***] business, and even though CPD may have thought they were competitive in [***] they are not today and were not in 1978. (Tr. 2327–28).

330. [***]

331. [***] attempted to develop [***] suitable for use with solvent inks, an ink application which does not use flushed color. Although [***] was able to develop a line of [***] that were approved by customers, [***] (Counihan 5644–47).

(3) *CPD's Marketing Resources*

332. CPD's greatest strength was its marketing force. (Counihan dep. CX 5087FFFF). CPD had a "very strong [and] knowledgeable **[96]**marketing team." (Counihan 5774–75, 5790–94). CPD's marketing/sales department was divided into three branches: sales, marketing, and marketing research. (CX 2005Y). The sales branch, which had nationwide coverage, was headed by a manager and had [***] regional sales managers, [***] salesmen, and [***] sales trainee. (RA 104; CX 2005EE–II). The marketing branch, also headed by a manager, consisted of various support personnel plus five technical service representatives (two for solvent inks, and one each for graphic arts, coatings, and government affairs). (CX 2005CC). CPD's technical service representatives were experienced in the printing ink and coatings industries and acted as liaisons between customers, salesmen, and the CPD research department. They both introduced new products to the customer and explained their application to the CPD salesmen. (Counihan dep. CX 5087FFFF–GGGG).

333. CPD's marketing activities were supported by a large technical service staff (about 30 employees) which was primarily oriented to the printing ink industry. CPD had two technical service managers, one for graphic arts and the other for coatings and plastics. (CX 2005W–X).

334. [***] rated CPD's sales force before the acquisition as average, and stated that its technical service operations spent less money than other competitors. [***]

(4) *CPD's Production Facilities—CPD Disinvestment*

335. Before the acquisition, CPD's Holland plant produced mostly flushed colors and some dry colors operating with three shifts a day, five days a week. (CX 1827; Long 5947).

336. CPD's Huntington plant produced both flushed and dry organic pigments. (CX 1827). Except for a two-week shutdown each year to service equipment, CPD operated the Huntington plant with three shifts a day, seven days a week. (Long 5944–46).

337. CPD had a third organic pigments plant, located in Port Hope, Canada, which began production in about 1971 but was closed down before CPD was acquired by Allegheny Ludlum. BWC has since transferred a salt grinder, two flushers, and a continuous dryer from Port Hope to Huntington. (Long 5966–69).

338. In 1974, CPD established an Engineering Department. Prior to that time, it was necessary for CPD to request engineering services through the Chemicals Group of Chemetron Corporation. **[97]**(Long 5898–99). Since 1974 the Engineering Department added five or six engineers at Huntington and four engineers at Holland. (CX 2005KK–LL; Long 5899–5901). The Engineering Department designed and installed a new facility for phthalocyanine green production at the Huntington plant. This facility was producing phthalo green at the time of the acquisition. BWC has subsequently shut down this facility. (Long 5914–19).

339. The Huntington plant of CPD, formerly owned by SUCO (Standard Ultramarine and Color Company), was built in 1909. According to Mr. Counihan, at the time the plant was acquired by Chemetron in 1964, it was "on the verge of collapsing," and since that acquisition, Chemetron made capital investments "on a band-aid basis." (Counihan 5563–68).

340. Mr. Panush of Celanese testified that he had seen the Huntington plant in the 1950's and it was then [***] (Tr. 2318). Mr. Papillo of CIBA-GEIGY stated that on a scale of one to ten, ten being the best, the Huntingon plant was [***] (Tr. 1898). [***] had considered and decided against the CPD acquisition. (Counihan 5547). The 1977–1982 [***] Long Range Plan described the Huntington plant as being [***] (CX 3105J) *Also see* CX 3106M, 3107L. A 1974 [***] presentation of organic pigments characterized the Huntington plant as [***] (CX 3223F).

341. The executive summary to the BWC 1980–1984 five year plan characterized the Huntington plant as [***] (CX 286B). The

BASF AG evaluation of the acquisition of CPD noted that at Huntington [***] (CX 967EEE).

342. Mr. Counihan testified that, had CPD's management agreed to spend the money to put the Huntington plan in good condition, the problems facing the Division would not be as intensive as they are today. (Tr. 5572–73).

343. Several years before the acquisition, the steel flooring under one of the acid tanks on the fourth floor of the intermediates section gave way and the tank fell to the floor below, smashed a continuous dryer and then fell through to the second floor. (Long 5814; Counihan 5568).

344. A few years prior to the acquisition, a section of steel flooring in the phthalocyanine area of the Huntington plant collapsed and a 20 by 20 foot section tilted down at an angle to the rest of the floor. (Long 5814–15; Counihan 5570).

345. The pipes in the Huntington plant are old. Steampipes failed when they were corroded through. In the case of a bad leak, **[98]**the operation associated with that pipe had to be shut down and repaired immediately. Once the pipe was shut down, it took between two and eight hours to repair. (Long 5809–10).

346. Process lines at Huntington, used to convey the product from one process to another, often ruptured. (Long 5809). Mr. Long, manager of CPD engineering, testified that in the 1970's CPD "had a failure in virtually every line in the plant." When a pipeline failed, the general procedure at Huntington was to repair only the section of pipe that had failed, for the reason that there was no fund for a total renovation package. (Long 5813). As a result, CPD was making repeated repairs on the same run of pipe. (Long 5811–12).

347. The pumps at Huntington were also in poor condition and in constant repair. At least two maintenance personnel were assigned full time to pump repair, and they would rebuild at least two to three pumps every day. (Long 5806–07).

348. Pumps in an organic pigments plant are used to transfer materials, liquids or slurries, from one tank to another or from a tank to a filter press. The failures experienced with the pumps were either motor failures, shaft failures or impeller failures. (Long 5807). When a pump involved in transferring material from one tank to another fails, the entire process stops. The result is lost production time. (Long 5808).

349. Mr. Long testified that CPD should have bought new pumps in the majority of cases rather than buying rebuilt or used pumps. (Tr. 5813). The reason that CPD did not purchase new pumps was

that they could not get the capital to do a total renovation package. (Long 5813).

350. Laurie R. Hiscock, Works Manager of the Huntington Plant of BWC, testified that the majority of the floors at Huntington are steel plates, with some flooring of concrete and some of grated steel. (Tr. 6017–18). The steel flooring was in extremely poor condition. Mr. Long testified that the floors were buckled in many areas, making it difficult to move across. (Tr. 5806). Mr. Hiscock stated that because of the movement of material and equipment over the floors, the floors tended to bend and separate over a period of time, and as soon as there was any moisture around, the corrosion increased considerably. (Tr. 6018).

351. Mr. Hiscock cited a number of instances where the deteriorating floor conditions caused serious production and safety problems. (*E.g.,* Hiscock 6025–36). He also testified that the condition of the floors in the plant made material handling very difficult within the entire Huntington plant. (Tr. 6018–19). CPD replaced the floor sections in a piecemeal fashion and then, in the words of Mr. Long, waited "very shortly for the next piece to fall." **[99]**(Tr. 5815). The reason all of the flooring was not replaced was that renovation funds were not available to CPD. (Long 5815).

352. The ventilation in the Huntington plant was poor. Hiscock testified that the "almost total lack of dust control, fume control, heat control, air flow, lighting, that all effected . . . . the morale problems in the bargaining unit, and additionally, morale problems within our salaried work force." (Tr. 6056). Mr. Hiscock discussed the drowning tanks used in the manufacture of phthalocyanine pigments, and noted that the large amounts of acid and heat used in this system tend to generate fumes which because of a lack of dust and fume control tend to scatter throughout that area of the plant. The fumes in this area of the Huntington plant corroded the tanks, the supports under the tanks, the vertical steel supports and the supports for the various pipes in the area. (Hiscock 6050–51).

353. The production equipment in the Huntington plant was old and of poor reliability. Mr. Hiscock characterized the equipment variously as "poor, very poor, very very poor" (Tr. 6039) and stated that most of the equipment was old, as much as 50 to 60 years old. (Tr. 6039). Mr. Hiscock testified that when discussing the functioning of the equipment on a day-to-day basis, CPD tended to "talk in terms of unrealiability as opposed to reliability." (Tr. 6040). Without the major pieces of equipment in operation, productivity in certain areas stops completely. (Hiscock 6040).

354. During the period 1971 to 1979, broken equipment was

replaced with used equipment rather than with new and, as a result, CPD experienced continual breakdowns. (Long 5803). Mr. Hiscock testified that during the year prior to the acquisition, under the rules established by ALI, the only thing that merited replacement capital would have been a failure of a major piece of equipment which seriously affected the production of a particular department and affected the availability of products for sales. (Tr. 6039). In most cases, the old pieces would be taken out, overhauled and then reinstalled. (Hiscock 6040).

355. One of the major pieces of equipment required to finish certain pigments is a salt grinder. During the period before 1979, CPD purchased three used salt grinders. (Long 5803). A used salt grinder cost CPD about $100,000 while a new one would have cost about $750,000. (Long 5804)

356. The used salt grinders continually broke down and production time was lost. (Long 5804). During the operation, a salt grinder is subject to considerable shock loading on the gears. When CPD purchased a used grinder it had no idea what the history of the machine was. (Long 5805–06).

357. The continued failure of Chemetron during the 1970's, and later ALI from 1977 to 1979, to provide necessary capital to maintain[**100**]the plant and equipment, increased the cost of production, increased the amount of substandard products, increased the amount of deadtime on the production lines and adversely affected the profitability of CPD. Mr. Hiscock testified that the poor reliability of the equipment at Huntington tended to make the costs escalate rapidly. When CPD personnel tried to turn on equipment, sometimes it would not run and other times it would spill the product "all over the place," causing large raw material losses or finished goods losses. (Tr. 6053–54). Mr. Alsager of BWC's marketing research testified at his deposition that CPD each year got more and more distressed "garbage" production. Finally, CPD had to have a "fire sale" of substandard material. (Alsager dep. CX 5083U). This substandard material sold for as little as $.50 per pound, discounted from $6.00 per pound. (Alsager dep. CX 5083W).

358. The Holland plant was built in 1919 but since it burned to the ground in 1946, most of the structures at the plant are ones which were rebuilt after the fire. (Counihan 5565). As a result, the condition of the Holland plant at the time of the acquisition was better than that of the Huntington plant. (Counihan 5576–77; Long 5816).

359. The Holland plant, however, was very congested as a result of haphazard expansion over the years. Mr. Long testified that the

Holland plant was very congested and was a difficult plant to work in, since over the years incremental expansion had occurred wherever there was any space free, and as a result the plant was so congested that it was difficult to move materials around in it. (Long 5816).

360. During the 1970's, the Holland plant experienced many of the same types of equipment breakdowns, including breakdowns of pipes and pumps, that occurred at the Huntington plant, causing lost production time. Throughout the 1970's, failed equipment was replaced with used or rebuilt equipment at Holland for the reason that the capital was not provided by either Chemetron or ALI. (Long 5819).

361. CPD's basic maintenance in the plants during the 1970's consisted of greasing and oiling equipment. (Long 5821–22, 5943–44). CPD attempted to institute a preventative maintenance program at the Holland plant in 1978, but was unable to follow through with the program. Mr. Long testified that a preventative maintenance program is desirable, but since the maintenance personnel at Huntington and Holland were continually fixing leaks and other emergencies, they did not have time for "the niceties of preventative maintenance." (Tr. 5822).

362. Most of the process engineering at the Holland plant was done by Research and Development personnel, rather than by the plant's engineering staff. (Long 5822–23). **[101]**

363. Once a product development or improvement was successful in the laboratory, in the 1970's, CPD would attempt to transfer the process into the production plant. (Long 5824–25). CPD encountered considerable difficulty in making this transition, since the production equipment in the plant lacked variable speed agitators, variable flow rates for adding materials to the process, and accurate and reliable temperature controls. As a result, substandard material was produced, and the research and development chemists had to spend considerable time in the plant working around the limitations caused by inadequate production equipment. (Long 5825–26). Time so spent by research and development personnel at the plant was charged to the research and development budget. (Long 5828).

364. Mr. Long, who had been associated with CPD from 1971 until the acquisition, testified that the Pigments Division needed $2.5 million more than they were getting in each year from 1971 to 1979 in order to accomplish the capital replacement and renovation required to place the plants in adequate operating condition. (Tr. 5888).

365. Each year CPD required a maintenance capital budget.

When the final budget was submitted, the Chemetron management would review the amounts requested and announce a final budget allocation for maintenance capital. The [***] capital budget [***] contained CPD's final request to Chemetron Corporation of [***] (Long 5878). The allocation finally approved by Chemetron management was [***] (RX 6762E; Long 5879). [***] (Long 5880).

366. Each expenditure had to be justified on the basis of either the return or profit that would be generated by the expenditure or by a reverse return or cost avoidance rationale. (Long 5860). Although formal submission of cost avoidance justification was not required on every RFE, it was required for most RFEs and it was necessary to have the data at hand to answer telephonic inquiries which Chemetron Corporation was likely to make concerning even the most insignificant expenditures. (Long 5871–74). RFEs for different amounts required approval by either the Chemicals Group Vice-President, the Chairman of the Board or the Board of Directors of Chemetron Corporation. (Counihan 5719).

367. As early as 1972, Fantus, an organization that investigates plant sites, studied the Huntington plant and recommended that it be closed and the operations moved elsewhere. (Counihan 5585). Chemetron's management turned down the proposals. (Counihan 5586–87).

368. Also in 1973, Mr. Long strongly recommended to Dr. Moore, the new group Vice-President, that the issue of whether or not to **[102]**relocate from the Huntington site be resolved as soon as possible. (Long 5850–53). In 1974, Mr. Long prepared a Major Capital Expenditure Proposal which assumed that Huntington would have to be phased out in the near future and recommended the purchase of a small plant on a site large enough for future expansion so that the Huntington operations could be transferred in an orderly manner. (Long 5855–57). This relocation proposal was not accepted by the management. (RX 6778; Long 5857).

369. In 1975, Mr. Counihan made a verbal presentation of the 1975–1980 Long Range Plan to the Board of Chemetron and recommended to upgrade Huntington or close it and construct a new plant. In a letter which was part of the Long Range Plan, Mr. Counihan summarized the situation as "increasingly critical." (Counihan 5616). He reviewed the options of moving to another site or refurbishing the existing plant and finally recommended that the plant be renovated at a cost of roughly ten to eleven million dollars. (Counihan 5616–17). Chemetron's management refused to approve either the renovation capital or the move to a new site. (Counihan 5618).

370. In 1976, after having been turned down on several occasions, Mr. Counihan met with Dr. Moore and suggested that if Chemetron did not wish to invest capital in the Pigments Division they should consider selling the Division. Dr. Moore raised this proposal with Mr. Gallagher, Chairman of the Board, and told Mr. Counihan that Mr. Gallagher did not want to sell the Division. (Counihan 5618–19). In 1977, Mr. Counihan met with representatives of Hercules Corporation, CIBA-GEIGY and Tenneco in attempts to find a purchaser. (Counihan 5544–46).

371. Mr. Sweeney of ALI testified that ALI decided to sell CPD after the acquisition of Chemetron because it was in a business about which ALI knew little, the facilities were less than satisfactory, the company was not at the leading edge of the state of the art, it had heavy capital requirements and because they believed they could find a buyer. (Tr. 7371).

372. When ALI acquired Chemetron in 1977, the Chairman of the Board, Mr. Robert Buckley, told Chemetron's management that he intended to sell the entire Chemical Products Group. (Counihan 5546–47). Mr. Counihan knew that CIBA-GEIGY was interested in purchasing the Division and ALI gave them a right of first refusal. CIBA-GEIGY studied the operation for four months and turned down the purchase because "they could see no way they could handle the Huntington plant." (Counihan 5547).

373. After CPD was acquired by ALI, capital could only be spent to maintain the plant, to keep the plant producing and on clear and present safety hazards. (Long 5863). After the acquisition, all projects which had been approved by Chemetron and on which CPD had **[103]**been spending funds were cancelled, no money could be spent and the only way CPD could spend capital funds was to justify each expenditure on a project by project basis for the previously approved expenditure. (Long 5864).

374. Mr. Counihan testified that the situation with respect to obtaining capital funds after Chemetron was acquired by ALI "got infinitely worse." (Tr. 5623). CPD was told that since it was going to be sold, it was to be limited in its spending to one million dollars, and it was monitored on a monthly basis to insure that it did not exceed that figure. (Counihan 5623; Long 5864).

375. Dr. Malchick testified that after the acquisition of CPD by ALI, he was told by Mr. Counihan not to work on any long range project, just on projects that would bring CPD money right away. (Tr. 3308).

376. [***] stated that it was his impression that CPD was on a long downhill slide.[***]

377. [***] testified that CPD was going downhill prior to the acquisition, in the period starting in the late 1960's and continuing into the 1970's and that the "Huntington plant was increasingly in bad shape from the standpoint of maintenance, from the standpoint of industrial relations, and that it wasn't being supported with additional investment." [***]. While [***] had "a healthy respect" for Mr. Counihan and Mr. Wickline of CPD, in his opinion other personnel of the Division varied from region to region from good to indifferent.[***].

378. Sun Chemical's perception of CPD as a competitor, contained in the Sun Chemical Corporation Pigments Division 1977–1982 Long Range Plan (CX 3105), was that while CPD's management was pigment oriented, Chemetron Corporation [***] (CX 3105). *See also* CX 3106N (Sun 1978–1983 Long Range Plan).

379. [***] testified that CPD's performance measured on a return on assets after taxes were satisfactory, but that was because the assets against which the return is measured were shrinking over time. The assets were being depreciated on a straight line basis every year, but no new assets were being brought into the Division to correct problems and bring it up to date. As a result, the net asset base was declining every year and when the return on assets figure is calculated, it was quite favorable. CPD was aware of this phenomenon. [***]

380. Dr. Morris A. Adelman, testifying as an expert witness for BWC, inquired into the proposition [***] that CPD had been disinvesting in the recent past and compared CPD's investment patterns with the figures reported in the Bureau of **[104]**Census' Census of Manfacturers, for the Chemicals and Allied Products industry group and the [***]. It was Dr. Adelman's conclusion, based on RX 2055–64, that for the period 1965 to 1971, all three invested on a net basis, but starting in 1972, although Chemicals and Allied Products [***] continued to invest net, CPD was "disinvesting," namely, CPD "was not spending enough of productive assets to make up for the inevitable loss of productive assets." (Adelman 10,150–52). *Also see* Adelman 10,157–70.

381. Dr. Adelman concluded from RX 2059–62 that "Chemetron is aging, its assets are getting older; whereas, the assets for these other two units cannot be said on the whole that they are going consistently up or down." (Tr. 10,167). He also concluded from RX 2064 that CPD could not have continued this ratio of real investment to real depreciation forever, because they were "living off their fat and sometime or other, they had to turn around and start investing or else the company would have to disappear." (Tr. 10,189).

382. On the basis of the exhibits he prepared and the testimony he reviewed, Dr. Adelman's conclusion concerning CPD's effectiveness as a competitor was that:

> Well, they were an ineffective decreasing competitor and their current market shares was probably a biased predictor, an over predictor of their subsequent market shares. That would be the estimate I make on the basis on the figures that stop in 1978, and it seems to me that the developments other than in the years following do bear out that kind of prediction, because the market share of Chemetron, if you make allowance for the addition of the BWC share, those continue to decrease just as these numbers would predict it would decrease. (Tr. 10,190).

383. After completing his economic analysis of CPD, Dr. Adelman opined that "Chemetron, standing by itself, I thought that their position in the industry was deteriorating and would continue to deteriorate, at least within limits, because of the fact that they had been disinvesting, allowing their productive assets to deteriorate and in part, to disappear." (Tr. 10,085).

384. Dr. Adelman's views regarding CPD's disinvestment is consistent with the testimony of [***] who was of the view that Chemetron had been on a long downhill slide. (Adelman 10,189–90). **[105]**

385. Based on his analysis, Dr. Adelman stated that Chemetron was on a slippery slope, that BASF/BWC could not stay in the organic pigments business in the United States indefinitely in the face of continuing losses and therefore he viewed the acquisition "as a salvage operation of putting two unpromising units together forming perhaps one viable competitor." (Tr. 10,089).

B. *BASF*

386. In 1979, BASF had worldwide net sales of $14,129 billion. (RA 153). This made BASF one of the three largest chemical companies in the world. Stipulation dated February 10, 1982, Exhibit A. *See also* CX 3215N.

(1) *BASF's Worldwide Pigment Position*

387. The manufacture of colorants (dyes and pigments) is BASF's oldest business. (Albers 6250–51). In the course of some 130 years in the dyestuffs and pigments businesses (Kohnle 4531–32), BASF has accumulated a wealth of knowledge and technology. (Geiss 2076–77). BASF, for example, developed the first synthetic organic pigment, lithol red, in the 1890s. (RA 27; CX 3508D).

388. BASF views its organic pigments business on a worldwide scale. (CX 718C; 769TT–GGG; 778; 960A, C–D). And it maintains a sales force and technical service personnel throughout the world. (CX 57Z–AA). BASF is recognized as one of the world's largest

organic pigments manufacturers. (Schober 1680; Lipton 1600–02; Whittemore 1951–52; Geiss 2074–75; Parker 4969–70).

389. BASF estimates its share of the worldwide organic pigments business to be about [***] (CX 963G; 966A; 1951A), and its share of worldwide phthalocyanine pigments market, on a poundage basis, to be approximately [***]. (CX 718C). By virtue of its technology and raw materials position, BASF dominates the European market for Phthalocyaninepigments. (CX 602O). And BASF sets the technical standards for phthalocyanine pigments in major markets. (CX 718R).

(2) *BASF Product Line*

390. BASF manufactures the following chemical types of organic pigments: phthalocyanine blue; phthalocyanine green; metal-free phthalocyanine; BON red 2B (Manganese) Salt; red 2B (Barium) Salt; **[106]**red 2B (Calcium) Salt; perylene; anthrapyrimidine flavanthrone; anthraquinoid; indanthrone blue; metallized azos; quinophthalone; nickel complex; nickel azo; monoazo; pyranthrone; lakes of rhodamine; crystal violet, victoria blue; lithol rubine; tetrachromo pyranthrone; and isoindoline. (RA 25; CX 3508I–J). Additionally, the U.B. Pigmente Division (formerly the Siegle pigments business) manufactures the following chemical types of organic pigments: thioindigo; hansa yellow; diarylide yellow and orange; naphthol red; dinitroaniline orange; toluidine; BON Red 2B (Manganese) Salt; monoazo; arylide; and lithol rubine. (RA 26; CX 3508J).

391. BASF's organic pigments are marketed worldwide under several trademarks, including "Heliogen" (phthalocyanine), "Lithol" (azo metal salts, such as Red 2B and lithol rubine), "Paliogen" or "Paliofast" (high-performance, such as perylenes, flavanthrones, anthrapyrimidines), "Paliotol" (high-performance pigments), and "Fanal" (basic dye complex pigments, such as PMA, PTMA Violets, rhodamines). (CX 129D–O; 1951G–P; 3508K).

392. BASF's organic pigment products are sold to all end-use segments of the industry. (CX 131; 1951G–N). In addition to pigments in dry form, BASF produces a wide range of pigment dispersions. (CX 1140O–Y; 1252A, J–O; 3508L–M). In 1979, BASF modified its pigment nomenclature so that each product number is preceded by a letter which identifies the primary end-use application recommended for the product. (Puff dep. CX 5094R–U). The prefixes "D", "L", and "K" stand for printing inks, paint, and plastics, respectively. (CX 1252C; Hahn 4093–95).

393. The organic pigments manufactured by BASF in West Germany are exported on a worldwide basis. (Stoeckl 5068). And the major United States competitors routinely monitor and evaluate the products sold by BASF in the United States or Europe. (CX 3223C, X;

3508; 3511; 3512; 3513D; 3514; Papillo 1818–19; Lipton 1598–1600; Whittemore 1948).

394. Phthalocyaninepigments are the "backbone" of BASF's organic pigments business. (CX 241CC; 593C; RX 2812V). Recognized as a world leader in the manufacture of both phthalocyanine blue and green pigments, BASF's assortment of phthalocyanines included, in 1976, ten alpha blue brands, 14 beta blue brands, 11 green brands, and 45 phthalocyanine preparations or dispersions. (CX 718R; 1951J; Geiss 2123–25; Panush 2256–59).

(3) *BASF Production Facilities*

395. The BASF Group manufactures organic pigments through subsidiaries or affiliates in Germany, France, the Netherlands, **[107]** Argentina, Brazil, Mexico, Australia, Indonesia, Spain, Turkey, Canada, Venezuela, and Colombia. (RA 28–29). BASF manufactures organic pigments in several plants in Ludwigshafen, West Germany. (Stoeckl 5061–68). In 1970, BASF acquired G. Siegle & Co., GmBH ("Siegle"), of Stuttgart, West Germany, a manufacturer and seller of organic pigments. Siegle later became a division of BASF Farben & Fasern AG ("F&F AG"), known as the "Unternehmensbereich (U.B.) Pigments" Division. Siegle has sold small amounts of organic pigments in the United States market under its own name. (RA 12; CX 953A).

396. Between 1976 and 1978, BASF constructed a new facility in Brazil (RA 147) and in Ludwigshafen. The new facility in Ludwigshafen (designated as Building C 312) began production of phthalocyanine [***] pigments in early 1978. (Muench 3884–86; Stoeckl 5072–74). The construction of C–312 cost about [***] million, and was to increase BASF's production capacity for phthalocyanine pigments at Ludwigshafen to about [***] tons. (CX 723W; 749B, E; 1717C; 3407A; 3415F; 3508O; 6014; Stoeckl 5075–76). In 1979, when worldwide capacity for phthalocyanines exceeded demand (CX 3224D), [***] (Stoeckl 5110–12). During the same period, BASF [***] (Stoeckl dep. CX 5097N–O; Stoeckl 5078–79).

(4) *BASF's Research And Development*

397. BASF's pigments research and development is conducted in several laboratories in Ludwigshafen, including the Dyestuffs Laboratory, the Development Group Laboratory, the Pigments Development Laboratory, and a laboratory in Sparte CT. Pigments research is also conducted by the "U.B. Pigmente" division in Stuttgart. *See generally* CX 1077–84; 1086B.

398. The Dyestuffs Laboratory, which is the central research color lab, engages in research relating to the synthesis of new

chemical types. (Hahn 4071–73). The production-site laboratories in Stuttgart and Sparte CT, engage in research and development related to modification or improvement of existing BASF products. This function includes work on a pigment's dispersibility, fastness properties, hue or shade, and applicability in various vehicles systems. (Hahn 4071–73).

399. The Development Group Laboratory, headed by Dr. Bock, engaged in applications testing and evaluated competitive products. **[108]**(Bock dep. CX 5085C; Hahn 4071–73). Dr. Bock's group is further subdivided into sections which are responsible for pigments used in specific end-use segments of the industry. (Bock dep. CX 5085B–C). Also within the Technical Services - "Sonder F" Subdepartment of Sparte CP, there exists a "Market Opening Pigments and Dyestuffs" group and technical services group for each end-use industry. (Bock 3456–57).

400. The Development Group laboratory (CPE/SF 1) is BASF's primary link between its research and development facilities and its sales organizations. (Bock 3457). Each year, it receives approximately [***] sample products from the central research laboratory and [***] samples from the production site laboratories. Each of these samples is given an individual "E" (developmental or experimental) number. (Bock 3451–52). After these products are tested further, they may be made available to selected customers for test use. (Aschner 5414-15).

401. BASF approved research budgets for organic pigments in the following amounts for the years 1974–1979:

1974	[***]
1975	[***]
1976	[***]
1977	[***]
1978	[***]
1979	[***]

(RA 144).

402. BASF's R&D has resulted in the development of new chemical types of organic pigments and significant improvements in existing products. BASF developed isoindolines and nickel complex pigments. (Bock dep. CX 5086P–R; Papillo 1838–38A). [***] (Bock dep. CX 5086R–S). [***] (Hahn dep. CX 5089V; Puff dep. CX 5094HH–II). [***] (Bock dep. CX 5085CC; CX 115D–G). Some developments by BASF are patented in the United States. (CX 1807).

403. BASF's R&D capabilities are generally considered to be among the best in the industry. (CX 204N; 3113A–C; 3215B, D, J, N;

3223H, S, X–Y; 3508T–U; Papillo 1838–38A; Geiss 2073–74). BASF advertises its colorants business in the United States as "based on [109]one of the world's largest research and development programs for new pigments, new dyes and improved application technology." (CX 6004; 6005).

(5) *Vertical Integration of BASF*

404. BASF is a major worldwide manufacturer of intermediates used in the production of organic pigments. (Papillo 1813). In 1978 and 1979, it produced some [***] different intermediates used to manufacture organic pigments. (RA 31; CX 1102). And about [***] of the intermediates used by BASF are internally produced. (CX 1101; Muench dep. CX 5092BB–DD). BASF is also integrated forward into the manufacture of printing inks, paints and coatings. F. 2, *supra.*

(6) *The 1978 Reorganization of BASF—Separation Of Pigments Business From Dyestuffs*

405. On January 1, 1978, BASF reorganized the structure of "Ressort" C, resulting in the formation of Sparte CP (Pigments and Auxiliaries), which had previously existed as a part of Sparte CF (Dyestuffs, Pigments and Auxiliaries). (CX 57; Muench 3849–50). The reorganization was necessitated by the rapid growth of Sparte CF and a desire to centralize BASF's pigments business in one organizational unit. (Muench 3851; Albers 6164–65). BASF also felt that by separating its pigments and dyestuffs businesses into separate units, the customers of each would be better served. (Albers 6164–65). Sparte CT continues to manufacture a few organic pigments for Sparte CP at Ludwigshafen. (Kohnle 4529–32; Stoeckl 5059–60).

(7) *BASF's Colorants Position In The United States—BWC*

406. BASF marketed its organic pigments, inorganic pigments, dyestuffs, and auxiliaries in the United States through the Colors and Auxiliaries Division of BWC. The Colors and Auxiliaries Division consisted of four basic businesses: Textile Colors and Chemicals (TCC), Pigments and Industrial Colors (PIC), Leather Finishes/Subox (CLF), and Whitestone. (CX 182D).

407. BWC is an indirect subsidiary of BASF AG. BWC is engaged in several businesses in the United States, including the importation and sale of organic pigments produced by BASF AG. (Albers 6166). [110]Organic pigments was a small part of BWC's business before the acquisition and remains a small part today. (Kohnle 4396). Prior to BWC's acquisition of CPD, virtually all of the organic pigments sold by BWC in the United States (with the exception of a small amount produced at BWC's South Kearny operation) were imported. (Hahn

3957; Albers 6166, 6191; Stipulation Between Counsel Concerning CX 9–43 and CX 2901–24, p. 3).

408. BASF's colorants business in the United States was developed through imports and establishment of domestic manufacturing facilities. (CX 182D). In 1961, a formulation plant for textile auxiliaries and pigments was constructed at Charlotte, North Carolina. In 1967, the Basacryl dyestuffs plant was constructed at BWC's South Kearny, New Jersey site. By 1968, BASF was producing and marketing textile dyes and auxiliaries in the United States. In 1973, a plant for disperse dyestuffs (the Palanil plant) was constructed at South Kearny. (CX 602D; Hahn 3954–55, 4121). BASF considered its participation in the United States colorants business to be inadequate in relation to its worldwide position. (CX 769VVV; 960A; 1006I; Hahn dep. CX 5088FF–KK).

C. *BASF Wyandotte Corporation's PIC Department*

409. BWC's PIC Department started as an import resale business (CX 212D), and was "established to exploit the strengths of BASF technology for the U.S. pigment market." (CX 1951A). The PIC Department markets pigments, pigment dispersions, and dyes for nontextile uses. (CX 114A-B).

410. In 1971, the PIC Department of BWC established a phthalocyanine pigments presscake pilot plant in the Basacryl plant at South Kearny. (CX 212H; 1701A). By 1974, the PIC Department had expanded to include technical service specialists for each major end-use segment of the organic pigments industry, a laboratory which engaged in product evaluation, and a national sales force. (CX 155N; 708U; Hahn dep. CX 5089W). By 1974, PIC Department sales had increased to $11.5 million. (CX 708C).

411. From 1974 through 1978, the PIC Department of BWC continued to expand its operations. (CX 220G; 723DD). It developed an overall strategy designed to exploit the market segments where BASF technology excelled (CX 239D) and generate a sufficient sales base to justify construction of a domestic organic pigments plant. (CX 220A; 239A). To achieve these objectives, [***] (CX 212M; 214D; 220A; 240C) [***] (CX 187LL, BBB, GGG; 212N; 706B; 723X–CC). [111]

412. From 1970 through 1978, BWC as a whole made the following sales of organic pigments in the United States:

Year	Pounds	Value
1970	578,919	$2,348,193
1971	591,463	1,828,518
1972	855,488	3,272,560

Year	Pounds	Value
1973	939,569	3,926,647
1974	899,695	5,132,895
1975	645,792	3,843,627
1976	1,111,815	7,075,864
1977	[***]	[***]
1978	[***]	[***]

(RA 158; CX 1704). From 1970 through 1978, BWC's sales of organic pigments more than [***] on a poundage basis, and more than [***] on a value basis.

413. BWC sold some organic pigments (dry and dispersions) to all end-use segments of the market. (CX 114D–E, H, I, J, N; 1252A–H; 1705; 1709). BWC did not sell any flush colors. BWC's organic pigment sales in 1978 were (on a poundage basis): about [***] to the printing inks industry, [***] to the paints and coatings industry, [***] to the plastics industry, [***] to co-manufacturers (for resale), and [***] to other miscellaneous end-use industries. (CX 1705).

414. As of 1978, BWC's organic pigments product line consisted of some [***] different product codes from the following chemical families: phthalocyanine blue and green, metallized azo (including lithol rubines), perylene, pyranthrone, anthrapyrimidine, nickel complex, flavanthrone, indanthrone blue, quinacridone, carbazole dioxazine, azo methine, quinophthalone, isoindoline, monoazo, and diarylide pigments. (CX 1702H–J; 1703; 1704).

415. BWC did not do basic research in the United States. (Geiss 2159). Although it had access to BASF AG's research and technology in Germany, it was [***] (Panush 2316, 2327).

416. BWC did not manufacture any organic pigment intermediates in the United States. (Hahn 3956–57).

417. With the exception of 1975, the BWC/PIC sales increased steadily from 1970 through 1977. (CX 187AA; 220G; 247G; Hahn 4129–[112]31). Except for [***], its profits were [***] (CX 187AA; 220G; 239B; 247G).

418. In 1970, BWC had [***] salesmen distributed around the country selling pigments. By 1974, that number had increased to [***]. BWC had difficulty recruiting successful, aggressive salesmen because it was a small company with doubtful products and the chances for promotion probably did not look favorable to some candidates. (Hahn 3957–58).

(1) *BWC Had Difficulty In Selling Imported BASF Pigments In The United States In Part Because Of Lack Of Understanding Of United States Pigment Requirements*

419. Dr. Hahn, former general manager, Colors and Auxiliaries,

BASF Corp. (U.S.) and now head of R&D, Sparte CP, BASF, testified that one problem encountered by BWC, when it considered building a domestic plant, was that it did not have enough knowledge about the manufacturing process for individual pigments in the United States. (Tr. 3987). Dr. Hahn also stated that BWC's presscake operation at South Kearny was designed to give BWC greater expertise in phthalocyanine green shade pigments for use in the United States but was never successful. (Tr. 3970–71).

420. Mr. Aschner, former marketing manager of BWC/PIC, testified that the "drehrohroffen" process developed by BASF AG for producing phthalocyanine produced a drastically different color than what BWC had been supplying to Ford Motor Co. for automotive use. This almost resulted in BWC losing its business with Ford. BWC was subsequently forced to physically blend two phthalocyanine standards in order to match the previous phthalocyanine standard. (Tr. 5370–71). Mr. Panush of Celanese Corporation testified that BWC did not understand the pigment requirements of the United States market and was, before and after the acquisition, an unreliable supplier. (Tr. 2316, 2327, 2370–71).

421. BWC lacked the know-how in flushed pigments which were popular among the United States oil-ink producers. (RX 4070I; CX 922B(R)).

422. Dr. Bock, head of pigment application technology of BASF, testified that as a result of the finishing and production methods used in the United States, pigments sometimes have different application characteristics in the United States than they do in Europe. For example, in the printing process for publication gravure [113]in many countries in Europe, toluene is used as a solvent, whereas in the United States, preference is given to mineral spirits. (Tr. 3398– 99).

423. Mr. Aschner testified that BWC was "out of sync" with pigment requirements in the United States. (Tr. 5341). He also stated that BWC sometimes had difficulties meeting established United States standards. He described a situation in which BWC was unable to match a standard for green shade type phthalocyanine blue, used in gravure ink, that had been established by DuPont. (Tr. 5351-52). He stated that BWC, using imported pigments, was rarely able to give a customer an economic incentive to change from an existing standard. (Tr. 5352–53). Mr. Aschner stated that BWC was unable to compete in the mainstream of the yellow business because it lacked the specific pigments or chemistry that was required. In yellows, BWC was "relegated to a relatively smaller portion in the area of specialty pigments or vat pigments." (Tr. 5358). In oranges, BWC was

not competitive from a technical standpoint, and certainly not competitive pricewise. (Tr. 5359–61). BWC could not compete against the domestic producers of violet organic pigments. (Tr. 5361–62). In reds, BWC was relatively insignificant because of economics and because of technical problems. (Tr. 5362–65). BWC's products "did not work the way that the master products worked." (Tr. 5364). In blues, BWC was small because of price competition, because of difficulties in meeting industry specifications and because its pigments did not always perform favorably in American systems. (Tr. 5365–66, 5372). In greens, BWC had many formulation problems. (Tr. 5366–70).

424. Dr. Josef F. Kohnle testified that BWC's difficulties in selling organic pigments in the United States lay in the problem of the right formulation and the right specifications and the difference between Europe and the United States pigments. (Tr. 4500–01). Dr. Kohnle also testified that BWC was not successful in reformulating because it took too long, and with the pigments manufactured in Ludwigshafen, one could not impress the United States marketplace very much anyway. (Tr. 4410–11).

425. Dr. Erich Stoeckl is employed by BASF AG, most recently as head of pigment production. (Tr. 5016–17). He testified that BASF AG's pigment production in Ludwigshafen is [***] (Stoeckl 5027). Dr. Stoeckl state that [***] (Tr. 5116–18).

426. Dr. Hahn testified that BWC had difficulty meeting United States standards (Tr. 3962–63), and that there were differences in [114]the vehicle systems and the fastness requirements (*e.g.*, weatherability) between the United States and Germany. (Tr. 3963–65, 3967, 4085–87). He stated that in 1973–1974, when BWC was considering building a plant to produce organic pigments, it would have had to modify many of its existing products to meet United States standards. (Tr. 3979–80). Dr. Hahn stated that BASF AG never made a systematic effort to develop products suitable especially for the United States users. (CX 5088Y).

427. Dr. Hahn also explained the difference in red pigments between the United States and Germany. In Europe, for process printing the standard red is a lithol rubine; in the United States, the cheaper lithol reds are the dominant color. (Tr. 3965–66). He also stated that there were differences in the characteristics of phthalocyanine, particularly green shade blue phthalocyanine, used in the United States and Europe, which hurt BWC's ability to sell these pigments in the United States. (Tr. 3966, 3970, 3973). *Also see* CX 629F; 718S(R); 908B.

428. Mr. Alsager testified that prior to the acquisition of CPD,

BWC sold pigments for use in coätings and a very small amount for use in plastics. The largest single purchaser by far of BWC's organic pigments intended for use in inks was Siegwerk, Inc., a BWC affiliate. Alsager testified that Siegwerk "was a German company using German technology and other Amerian companies were virtually excluded from that account." (Tr. 3609). Also the bulk of the activated pigments sold by BASF in the United States were sold to Siegwerk. (Hahn 4108).

429. Mr. Klaus Stammen, President of Seigwerk, Inc., appearing for complaint counsel, testified that his company's formulations were [***] (Tr. 2488). He also testified that his customers [***] (Tr. 2448–49). [***] (Stammen 2449–52; Muench 3928).

430. Dr. Hahn of BASF testified that there were instances when BWC did not have enough pigments on hand, requiring that shipments be rushed in by plane from West Germany. Dr. Hahn also testified that pigment shipments were sometimes delayed by dock strikes. (Tr. 3974–75). Dr. Josef F. Kohnle, discussing the period 1975–1978, stated that BWC was not considered a reliable supplier by United States customers. (Tr. 4402, 4404).

431. Mr. Sol Panush of Celanese Corporation testified that [***] **[115]**[***] (Tr. 2312–13, 2370–71).

(2) *BWC's Import Business Was Hurt By A High Tariff On Organic Pigments Competitive With Domestically Produced Pigments*

432. Mr. Muench of BASF testified that the tariff made importing organic pigments into the United States more difficult and that the effective tariff paid by BWC on imported organic pigments in 1978 averaged close to 30% of the market price of the organic pigments being sold in the United States by BWC. (Tr. 3794–96).

433. Dr. Hahn testified that high duties (in the 30% range) made BWC's import business unprofitable. (Tr. 3960). Dr. Kohnle, BWC's group vice-president, testified that the tariff rate is probably the single most important factor in explaining why BWC's business of importing pigments was unprofitable. He stated that the tariff for 95% of the organic pigments imported by BWC was 20% of the list price, and only 5% were specialties to which the lower tariff rate of 12.5% applied, and that since many sales were off-list, the effective tariff rate (for the period 1975–1978) was higher. (Kohnle 4403), 4411, 4501–02; Albers 6190).

434. Mr. Geiss of American Hoechst also testified that the tariff, [***] (Tr. 10,704–07, 10,725–26). Mr. Parker of ICI testified that in the past, the tariff represented a significant portion of the total selling price of the pigments. (Tr. 4953–55). Mr. Papillo of CIBA GEIGY also

testified that the high tariff made it harder for CIBA GEIGY to import conventional pigments, including phthalocyanines, profitably. (Tr. 1878).

435. Professor Markham, an expert witness for respondent, expressed an opinion that the high tariff was a factor which made exporting from Germany to the United States an unprofitable activity. (Tr. 7950–54). He also stated that organic pigment tariffs were among the highest he encountered and characterized them as "protectionists." (Tr. 8031–34).

436. [***] (CX 54B; 967BB; Muench 3939). *See* Stipulation Between Counsel **[116]**Concerning CX 9–43 and 2901–24. [***] (Geiss 10,699–10,700).

437. Several witnesses, including those called by complaint counsel in their case-in-chief, testified that costs of producing organic pigment were higher in Germany than they were in the United States. (Papillo 1875–76; Geiss 2136, 2169).

438. To the extent the German costs were higher, these costs were reflected in the "CIF" (cost-insurance-freight) prices BASF charged BWC on imported organic pigments (Aschner 5340–41, 5343, 5356–57). The CIF price on each product imported was the transfer price between BASF AG and BWC, and thus established the minimum selling price for BWC in the United States. (Aschner 5340–41). Mr. Aschner testified that the CIF prices often increased due to the declining value of dollars and the higher costs in Germany. (Tr. 5356–57). He stated that "[w]e were literally in a vise" between higher BASF AG costs and price competition in the United States. (Tr. 5357).

439. Several officials of BASF also testified about personnel and raw material price increases in Germany during the period 1975–1978. They stated that a leap in labor costs in Germany may have taken place during the period 1976–1977. They stated that raw materials and labor costs are more expensive in Germany than they are in the United States. (Hahn 3974; Kohnle 4402, 4404, 4498). Dr. Hans Albers, a member of BASF's Vorstand, testified that BASF experienced unsatisfactory export results in part because of rising labor costs, energy costs and raw materials costs in Germany. (Tr. 6184–85).

440. Mr. Geiss of American Hoechst testified that, prior to its acquisition of CPD, BWC was [***] (Tr. 2169, 10,703, 10,726). Mr. Papillo of CIBA-GEIGY testified that CIBA-GEIGY, prior to its acquisition of Hercules, faced the same problems as did BWC. (Tr. 1875–76).

441. Professor Jesse W. Markham, respondent's expert witness,

expressed an opinion that BASF was suffering because of its problems with exchange rates, a high tariff and high German labor costs. (Tr. 7949). Professor Markham also testified that higher production costs in Germany made exporting organic pigments to the United States more difficult. (Tr. 7950). He found German raw material costs to be higher than United States raw material costs. (Tr. 7994–96). In his opinion, the oil price rise had a more severe impact on German raw material prices than on United States raw material prices. **[117]**(Markham 7995). He also gave an opinion that labor costs in Germany were generally higher than for the United States for the period from 1972 on, as were utility costs and capital costs. (Tr. 8004, 8014–16, 8021–22).

442. Mr. Muench, director of BASF's Sparte CP, testified that BWC would sometimes seek a price concession from Sparte CP in Germany. Sparte UN (the division in charge of BASF's North American operations) would submit a request to Sparte CP explaining why it required a lower transfer price. (Tr. 3926). This would then be examined by the management and the request would either be approved or rejected. (Tr. 3791).

443. Dr. Kohnle of BWC testified that RX 8003 (admitted into evidence as CX 251) illustrates BWC's attempts to obtain [***] (Tr. 4424). [***] (Tr. 4425). *Also see* CX 251; 721; 762; 1254–55; 1262C). [***]

444. Several officials of BASF/BWC also testified that the declining dollar value against the DM hurt BWC's organic pigments import business. (Hahn 3949–55, 3974, 4008–09; Kohnle 4401–02; Aschner 5355; Albers 6183–84; Muench 2136). *Also see* CX 152F; 165A; 702E; 741A.

445. Mr. Geiss of American Hoechst testified that [***] (Tr. 2169, 10,703, 10,726). Mr. Papillo of CIBA-GEIGY also testified that, prior to CIBA-GEIGY's acquisition of Hercules, it was difficult to import because of the exchange rate and the strengthening of the Swiss franc vis-a-vis the dollar. (Tr. 1875–76).

446. Professor Markham, respondent's expert witness, expressed an opinion that the decline of the dollar vis-a-vis the deutsche mark made exporting to the United States a money-losing activity. (Tr. 7951–54).

447. Because almost all of BASF's organic pigment sales in the United States were products imported from West Germany, the decline in the value of the dollar relative to the deutsche mark adversely affected BASF's ability to export pigments to the United States and BWC's ability to sell its imports profitably. (CPF 473). **[118]**

D. *Incentives For BASF/BWC Expansion In The United States*

(1) *Attractiveness Of The United States Market*

448. BASF was committed at the highest levels of its organization to become a major factor in the United States organic pigments market. (Stoeckl 5035; Hahn dep. CX 5088FF–KK; CX 902A). As a leader in the manufacture of dyes and pigments, BASF's strategy was "to create a worldwide market for its dyestuff and pigment know-how and to gain a commensurate share of the United States market." (CX 960A). BASF considered its share of the United States organic pigments market to be "an obvious underrepresentation." (CX 960C).

449. The United States organic pigments market is the largest in the world, representing approximately 28% of the world's consumption of organic pigments. (CX 754A; 955F; 1802; Geiss 2073). It represents a source of development for new products and applications that affect the worldwide market for pigments. (Muench dep. CX 5092R–T; Puff dep. CX 5094EE; CX 956C). During the 1970s, the organic pigments market in the United States grew at a rate greater than the G.N.P.'s. (CX 166CC; 186A; 212Q; 221C–D; 247F; 702C, O; 960A; 2042KK–LL).

450. The tariff imposed on imported organic pigments adversely affected BASF's ability to import pigments into the United States. The declining value of the United States dollar in relation to the deutsche mark also offered an economic incentive to BASF to establish organic pigments manufacturing capability in the United States. During the 1970s, the cost of manufacturing organic pigments in West Germany increased substantially. The landed cost which BWC paid to BASF for its organic pigment imports was set in West Germany. Because BASF's manufacturing costs were increasing, BWC had difficulty obtaining price concessions on imported pigments from BASF. (CPF 478–80). *See* F. 432–47, *supra*.

451. BASF recognized the economic advantages that could be derived by establishing a United States organic pigment production facility. BASF and BWC realized that domestic production facilities would significantly enhance their penetration of the United States market. (CX 155A; 182E; 187DD–EE; 203F; 247F; 631A–B; 702E; Hahn 3976; 4008–09; Albers 6259–60).

452. Because of the close relationship between dyestuffs intermediates and organic pigments intermediates, there are **[119]**advantages in establishing an integrated facility. (CX 563E; 564B–E; 568A–D; 570G; 580; Geiss 2060; Stoeckl 5025–27).

453. In 1978, BASF acquired ownership of Dow Badische Corporation. (RA 146). Dow Badische consumes organic pigments in its

production of fibers. (RA 146). In 1980, BASF acquired a partial interest in Cook Paint & Varnish, one of the six largest coatings manufacturers in the United States. (RX 6602C; CX 932; Albers 6261–64; 6270).

(2) *BASF/BWC's Expansion Capabilities In The United States*

454. BASF has the financial and technological resources to expand its organic pigments business in the United States. BASF has made and contemplates making substantial investments in chemical-related manufacturing facilities in the United States. (CX 52B–E; 6020; Albers 6269–70; Mecke 4328–29). BASF has increased its participation in the dyestuffs, inorganic pigments, and other chemical-related businesses through construction of domestic production facilities in the United States. (RA 147–52; CX 222J; 556B; 602D; Albers 6267–69; Mecke 4329–30).

455. BASF's market entry strategy contemplated a two-step process: establishment of a business based upon imported products followed by construction of local manufacturing facilities when the volume of business was sufficient to support a plant. (Kohnle dep. CX 5091Q–U; Hahn dep. CX 5088GG–HH; CX 155A; 161K; 199B). This strategy sometimes required BASF to sustain losses on the business until the domestic production facilities could be established. (Kohnle dep. CX 5091H–K; Lipton 1602–03; Whittemore 1966–70).

456. BASF had well defined procedures for transfers of technology from BASF to BWC and for construction of manufacturing facilities utilizing BASF technology. [***] (CX 64; 65; 216F–G; 556; 583E–F; Hahn dep. CX 5089F–K). During the period 1970–1980, BASF transferred significant organic pigment production technology to BWC, particularly between 1976 and 1979 and in conjunction with the planning for organic pigment production at the Rensselaer site. (Int. (II) 6).

457. BASF's Technical Services Department (CPE) coordinated the research and development related to the United States organic [**120**]pigments market. (Bock dep. CX 5085L–M; Bock 3464–65). CPE was continually apprised of technical developments in the United States organic pigments market (Bock dep. CX 5085O–R), and received results of BWC's tests on BASF's products. (Bock dep. CX 5085O–Q). BWC transmitted to BASF "Annual Technical Reports" which detailed both competitive activity in the United States market and BWC's performance for the year. (CX 706; 708; 715; 723; 785). CPE was responsible for evaluating products of United States competitors against BASF's. (Buff dep. CX 5094L–N).

458. CPE regularly sent samples of BASF developments to BWC that it thought would be of interest to the United States market.

(Bock dep. CX 5085Q–S; Bock 3470). The samples ("E" or "SF" products) were tested in Ludwigshafen and at BWC before they were offered to customers for testing in the United States. (Bock 3470–71; Aschner 5414–15). BASF was also engaged in a research and development effort specifically for the United States organic pigments market, [***] (CX 212P; 213J–K; 722A–F; 737; 741; 744; 745B–C; 759; 1951A; Bock 3475–80; Bock dep. CX 5085S; Hahn dep. CX 5088V–Z).

459. There has been substantial interaction between the Technical Service Department at BASF and the technical service personnel at BWC. (Bock 3464–65). For example, Dr. Erwin Hahn, the director of BASF's central research laboratory, was formerly the General Manager of the Colors and Auxiliaries Division of BWC. Gunter Kirchmer, who is the leader of BASF's "Market Opening Group - Pigments and Dyestuffs" and is responsible for worldwide introduction of new pigment products (CX 61), was formerly the Technical Service Manager of BWC's PIC Department. (Bock 3463–64). BASF Technical Service personnel were often sent to the United States to visit BWC's customers and competitors in order to identify areas of product development or application trends that could be pursued or introduced into the United States market. (Bock 3475–77; Puff dep. CX 5094CC–EE; CX 702; 704; 727; 731).

460. In order to capitalize on BASF's position in phthalo pigments in the United States, BASF and BWC developed a "phthalocyanine strategy" for the United States market. (CX 723W–CC). This concept envisioned the development of a new product by BASF and an increased marketing effort by BWC to generate a sufficient volume of sales to justify construction of a domestic organic pigment manufacturing facility. (CX 214D; 221R; 222Z; 227F–G; 714; 716; 717E–O; 722A–G; 737; 741F–G; 744A; 768I–J, S; Bock 3478; Aschner 5501–02, 5499–5501, 5442–45). **[121]**

461. BWC's sales of phthalocyanine pigments in the United States increased substantially on a poundage and value basis from 1970 through 1978:

Year	Pounds	Value
1970	486,000	$1,285,000
1971	516,000	1,258,000
1972	670,000	1,768,000
1973	713,000	2,183,000
1974	611,460	2,820,735
1975	362,613	1,898,404
1976	823,602	4,476,603
1977	[***]	[***]
1978	[***]	[***]

(RA 138; CX 1704). *See also* CX 230C; 233C; 234B; 235B; 285G; 706J–K; 708L–O).

462. In conjunction with its "phthalocyanine strategy," BASF developed "activated pigments." (CX 752A; 743U, FF; Bock 3477). Activated products, patented by BASF (Smith 1548–49), were promoted in competition with finished organic pigments. (CX 240B). The activated pigments sold by BWC in the United States market are Paliofast Blues 7060 T, 7228 I, 7160 TD, and 716 TP, which are all phthalocyanine blues. (CX 9B; Aschner 5447–48, 5481–82). BASF was also pursuing the development of activated forms of other organic pigments and new types of activated phthalocyanines for introduction into the United States market. (CX 713A; 741B–C; 743F, L, U, FF; 745C; 750; 752; 753; 768D–F; 794; 798; Hahn 4107).

463. BASF also developed organic pigments to replace chrome and lead-based inorganic pigments in the United States. (Hahn dep. CX 5089S–V; Bock dep. CX 5086B–D; CX 203E; 204B; 212P; 213J–K; 214E; 227O; 704J–M; 723MMM–PPP; 768G–H; 1082F–G; 1153A–B, K–N; 1155; 1157; 1158). They include Paliotol Yellow 2140 HD and 0960 HD, which are isoindoline and quinophthalone pigments respectively. (CX 1082G; 1083F; 1702J; Aschner 5476–78). BASF's isoindolines were regarded by the industry as a significant advancement and technical innovation (Geiss 2073–74; Papillo 1838–38A; Smith 1476), and were introduced at [***] (CX 777), Ford (CX 771D), and [***] (CX 772). BASF's quinophthalone pigments were also recognized as a significant advancement (CX 3102), and BASF is in the process of commercializing a variety of Paliotol pigments of different chemical types in the United States. (CX 106; 108; 109; 6003).

464. BASF and BWC prepared one-year and five-year plans on an annual basis. (Kohnle dep. CX 5090I–L). BWC's plans were **[122]** incorporated into Sparte UN's plans, which were approved by BASF's Board of Directors ("Vorstand"). (Kohnle dep. CX 5090I–L). Sparte CP, which was responsible for BASF's worldwide organic pigments business, reviewed BWC's pigments-related plans to insure that they were coordinated with Sparte CP's plans and objectives. (Muench dep. CX 5092N–O; Meunch 3859–60, 3781–84).

465. BASF set a limit on the amount Sparte CP, Sparte UN, or BWC could budget for capital investments. (Albers 6252–53; Kohnle dep. CX 5090N–P). The inclusion of a project in a five-year plan allowed the appropriate division to expend a limited sum of money to develop necessary engineering concepts and market studies. (Kohnle dep. CX 5090N–P; Albers 6180–81). Projects incorporated in approved five-year plans represented areas of interest or "wishful

thinking" (Muench 3857–63). After a project was incorporated in a five-year plan, it had to go through a formal approval process called "Project Definition" before the project was formally authorized. (CX 65; Kohnle 4390–94; Albers 6169; Muench 3777–78; Mecke 4165–69).

(3) *BASF's Internal Expansion Projects In The United States (1971–1978)*

(a) Operation Presscake—South Kearny Pilot Plant

466. In 1971, BWC installed a pilot plant at South Kearny, New Jersey, consisting of two filter presses and a salt grinder. (Kohnle 4492–93). It was designed to give BWC greater expertise in the production of phthalocyanine using the salt kneading process and to sell the products in the United States. Although phthalo presscake produced from the plant was of commercial quality and was sold to customers, it was closed in October 1977 [***] (RX 4059F; CX 175B; 213F; 215F; 225J; 226H–J; 608; 610; 627; 630; Hahn 3970–72, 4118; Kohnle 4420–22, 4492–93; Aschner 5342–46; Albers 6204–05).

(b) API Project

467. BASF realized that in order to increase its share of the United States market, it needed to establish domestic manufacturing facilities and began planning for construction of an integrated plant [123]for azo dyestuffs, pigments, and intermediates ("API") in 1973. After the preparation of detailed market studies, product assortment lists, site selection criteria, engineering plans, and cost calculations, BWC prepared a Request for Project Definition for API and submitted it to BASF on October 30, 1974. (RX 2812; CX 567, 587–96, 602; Hahn 3978–88, 3997–99). The estimated cost of the project was more than [***] million. (Hahn 3993–94, 4404–06). BWC spent more than [***] in the engineering and planning work leading to the Request for Project Definition. (CX 183K). But the API project never reached Commission S, the BASF unit responsible for screening capital investment proposals for the Vorstand. (RX 2003, 2074; 2812; CX 579B–C; 902A; Hahn 4012–13; Mecke 4174–77, 4188-94; Albers 6191–6206).

468. Dr. Morris Adelman, respondent's expert witness, expressed an opinion that, based on his analysis of the API project, BASF AG could not have entered the industry on a *de novo* basis. He testified that his calculations based on the same data used by BASF AG in coming to their decision showed API had a negative present value at any reasonable discount rate. (RX 2074; Adelman 10,093–97). Moreover, many of the assumptions on which RX 2074 was based and as used by BASF AG were unrealistically optimistic. (Tr. 10,112–17). He concluded that under realistic assumptions, the API project

"did not even come close to being viable under 1974 conditions . . . ." (Tr. 10,118–20).

(c) Rensselaer Pigment Facility

469. In March 1978, BWC acquired a colorants manufacturing facility (primarily dyes) located at Rensselaer, New York, from the GAF Corp. (RA 133; CX 1008). [***] (CX 1008A–G). GAF was at one time a supplier of phthalocyanines and its technology was considered to be of value. (Canon 12,542–43). BASF re-acquired its "Heliogen" trademark for use in the United States when it purchased the "Rensselaer Color Business." The Heliogen trademark, which is BASF's worldwide trademark for phthalocyanine pigments, had not been used by BASF in the United States before the GAF acquisition because it had been expropriated by the United States Government at the end of World War II. Since the Rensselaer acquisition from GAF, BASF switched its **[124]**phthalocyanine nomenclature in the United States back to Heliogen. (RA 129–35; CX 109; Hahn dep. CX 5088MM–OO).

470. One of the justifications offered by BWC and Sparte CP for the Rensselaer acquisition was that it would provide a site for any future expansion for the colors and auxiliaries division, *i.e.,* pigment production. (CX 1003B; 1004C; 1005M; Albers 6271; Kohnle 4504–09). [***] (CX 1001A; 1004C; Stoeckl 5086–88). [***] (CX 1020D).

471. In July 1978, Dr. Albers, a member of Vorstand of BASF AG, and Mr. Muench, the Director of Sparte CP, visited BWC and the Rensselaer site. (Albers 6271–72; Muench 3807–08, 3911–12). On July 24, 1978, in a memorandum summarizing the results of this visit, Mr. Muench stated in part: [***] (CX 920A). [***] (CX 920B). In September, at the direction of Dr. Albers and Mr. Muench, Dr. Stoeckl visited Rensselaer and concluded that [***] (CX 1014C). He recommended that BASF pursue both organic pigment production at Rensselaer and the acquisition of a United States manufacturer of flushed organic pigments. (CX 778E; 1014C; Albers 6273–75; Stoeckl 5019–24; Muench 3916). Some organic pigments were produced at Rensselaer (sold as catalysts by GAF) prior to its acquisition by BWC (RA 136), and there was room for expansion at the site. (RA 137; Lindenauer 7505–06, 7523; Kohnle 4440–42). **[125]**

472. Subsequent to the visit of Dr. Stoeckl, [***] (CX 1011; 1019; Stoeckl 5088–90), [***] (CX 1012). [***] (Stoeckl 5068–69) [***] (CX 1015A–B). *Cf.,* Kohnle dep. CX 5090S–V; Muench 3938–39; Stoeckl 5025–27, 5038–44, 5084–86, 5135–40.

473. In early November 1978, while BASF was negotiating for the possible acquisition of [***], BWC submitted a [***] (CX 1020Y; Kohnle 4510–18).

474. During the trial, Dr. Erich Stoeckl, head of the production department of Sparte CP, testified that [***] (Stoeckl 5022–24).

475. Referring to a recommendation that [***] (CX 1015B(R); Stoeckl 5026–27, 5086).

476. There was also some discussion about producing [***] Dr. Stoeckl concluded that [***] (RX 2843B; Stoeckl 5046–51, 5054). Dr. Stoeckl also testified [***] **[126]**[***] (Lindenauer 7502–03).

477. Dr. Stoeckl testified that [***] (Stoeckl 5083).

478. Regarding the so-called "Rensselaer Alternative," a proposal to build new facilities for alkali blue, C-Amine and azo pigments at Rensselaer, Dr. Kohnle testified that for this purpose completely new equipment had to be installed in new buildings and that the meagre projected profitability did not justify such an investment. (CX 1020; Kohnle 4558–60).

479. Mr. Muench, head of Sparte CP, who was primarily responsible for deciding whether an organic pigment plant should be added to Rensselaer, generally corroborated the testimony of Dr. Stoeckl and Dr. Kohnle regarding the Rensselaer pigment facility project. Mr. Muench testified that [***] (Tr. 3818–19). He testified that subsequently he [***] (Tr. 3816–18). *Also see* Albers 6210–21, 6248–49.

480. On December 7, 1978, Dr. Schroedel [***] (CX 1021A).

481. At the present time, one pigment (MOLORA red) is produced at Rensselaer. (CX 241CC, EE, HH; 273E; 1016; 1017F; 1018; 3818–20; Muench 3921–24; Kohnle dep. CX 5091B–D, N–O; Kohnle 4444–48). BWC officials testified that the transfer of MOLORA Red (formerly a CPD trademarked organic pigment) from the Huntington plant to Rensselaer was necessitated by [***] MOLORA Red operations at Rensselaer are said to be [***] (Kohnle 4444–48).

482. In 1981, BWC considered several alternatives for the integration of CPD's pigment production facilities at Huntington and Holland. (CX 657–63). One such alternative provided for the transfer of [***] (CX 657E). **[127]**

(d) Project U.S.A.

483. Earler in 1977, shortly after BWC's S. Kearney pilot plant was closed, BASF and BWC began to explore the construction of a phthalocyanine plant in the United States. (Kohnle 4426–31; Muench 3886–88). [***] (CX 631). [***] (CX 953). After a flurry of activity during February and March 1978, the plan languished because of uncertain economic prospects and increasing activity on the acquisition front.

484. Planning for the phthalocyanine plant (referred to as "Pigment Finish" or "Project U.S.A."), advanced through [***] (CX

632–35; 637; Muench 3893–94). [***] (RX 4099; CX 639; Bock 3401–03).

485. [***]

486. [***] [128][***]

487. Dr. Hans Albers, a member of BASF's Vorstand and Resource C, generally corroborated Mr. Muench. He testified that the Project U.S.A. was rejected because its estimated BBE II (GOR II) of 6.2% was too low to justify the project. (Albers 6202–03). He also testified that he did not believe the sales forecasts used to justify the Project were realistic. (Albers 6206). *Also see* CX 955B, F; 956A.

488. Dr. Adelman, respondent's expert witness, agreed with BASF's analysis that Project U.S.A. was not economically worthwhile. On the basis of his net present value ("NPV") analyses of the project data (RX 2303), he gave an opinion that Project U.S.A. was a "nonstarter," like API, with negative net present value (Tr. 10,127–28), and concluded that the Project U.S.A. was not a viable option for BASF. (Tr. 10,134–36).

E. *Acquisition Efforts of BASF In The United States During The 1970's Leading To The CPD Acquisition*

489. BASF had an established procedure governing the consideration and evaluation of acquisition candidates. This procedure required the submission of "Expertise", documents which analyze the nature of the acquisition candidate's business, its relationship to BASF and BASF's strategies, and economic profitability to Commission F, which then made a recommendation for approval or disapproval to BASF's Vorstand (Board of Directors). (Muench 3788–90; Kohnle dep. CX 5090Q–R). Between 1972 and 1979 (when BWC acquired CPD) BASF considered several United States organic pigment producers as candidates for acquisition.

490. In 1972, BWC investigated the possibility of acquiring GAF Corporation's organic pigment plant in Linden, New Jersey, and decided against it. (Hahn 3976–77).

491. In 1976, BWC and BASF considered the acquisition of Harmon Colors Corp. from Allied Chemical. Harmon was sold to Bayer AG, in early 1977, (CX 908–12; Albers 6236).

492. In July 1977, BASF considered the acquisition of Inmont, but rejected the idea based upon Mr. Muench's advice. (CX 916; Muench dep. CX 50930–P). [129]

493. In late 1977 and early 1978, BASF considered the acquisition of the pigments and intermediate products business of [***] (CX 913–15; Muench 3895–96; 3931–32).

494. On February 23, 1978 [***] (RA 118). During April and May 1978, BWC engaged in negotiations with Allegheny Ludlum Indus-

tries for the acquisition of CPD. (RA 119–20; CX 953–59; Muench 3901–03; 3906–08). On [***], Commission F recommended to Vorstand the purchase of CPD for [***] million. (RA 121; CX 960–63). Commission F stated that the purchase price was justified [***] (CX 963H).

495. On June 12, 1978, Allegheny Ludlum Industries announced that it had agreed in principle to sell CPD to Rhinechem Corporation, a subsidiary of Bayer AG, for about $49.5 million. (RA 123). On October 20, 1978, the acquisition of CPD by Bayer was temporarily enjoined by the United States District Court for the Northern District of Illinois upon a petition filed by the FTC. (RA 124–26).

496. After its May-June 1978 bids to purchase CPD failed (RA 117–24), BASF turned [***] (CX 918; 1011–12; 1014; 1020). *Also see* F. 469–80, *supra.* [***] (Muench 3911; CX 918–19). These various options, and the CPD acquisition, were all considered and evaluated in the context of BASF's desire to achieve a market position in the United States commensurate with BASF's worldwide position, to establish a domestic organic pigments manufacturing facility in the United States, to avoid the time and effort of building up a market share, to avoid adding production capacity, and to realize higher prices and profits. (CX 920; 922; 952F; 953A; 955B, 956A).

497. In July 1978, when Dr. Albers and Mr. Muench visited BWC, Mr. Muench recommended that BWC begin the preparation of Expertise I concerning Hilton-Davis and commence planning for organic pigments production at Rensselaer. (CX 920; Albers 6271–73). On July 21, 1978, BWC submitted Expertise I regarding the acquisition of Hilton-Davis to Dr. Minsinger, head of Sparte UN and a member of the BASF [**130**]board (CX 921), and about a month later an Expertise regarding the acquisition of a pigment manufacturer, covering Hilton-Davis, DuPont, Sun, and Magruder, was submitted to Commission F by Sparte CP and Sparte UN. (CX 922; Muench 3826–34). Commission F authorized negotiations with Sterling Drug for the acquisition of Hilton-Davis, a course favored by Mr. Muench at the time. (CX 923–24; Muench 3914–15; Muench dep. CX 5093N; Albers 627–79).

498. On October 12, 1978, in the 1979–83 Operating Plan of Sparte CP, Director Muench stated: [***] (CX 293B).

499. In October 1978, BWC began negotiations [***] (CX 969D).

500. When CPD became available again after the court injunction in late October 1978, BWC renewed its bid for CPD. (CX 929; 968). In a memorandum dated November 1, 1978, BWC noted: [***] (CX 929B). BWC's negotiations with Allegheny Ludlum Industries and [***] appear to have been concurrent. (CX 969–70). On November

17, 1978, nine days after the last recorded meeting between BWC and [***] (CX 390), BASF and Allegheny Ludlum Industries executed an agreement for the purchase of CPD by BWC. (RA 127).

501. Regarding BASF's acquisition efforts during 1978, Dr. Albers, a member of BASF's Vorstand, testified at the hearing **[131]** that [***] Regarding CX 922, Expertise I on the acquisition of a pigment manufacturer in the United States including [***], Dr. Albers testified that [***] (Albers, 6230–32). *See also* RX 4031.

502. Dr. Albers also discussed RX 4044 and RX 4054 regarding the possible acquisition of [***] (Tr. 6240–41). Dr. Albers testified that at the time BWC contracted to acquire CPD, in November 1978, he did not believe that there were other alternatives open to BWC. (Tr. 6242–43). *See also* RX 4059J.

503. Dr. Albers summarized the reasons why the Vorstand of BASF AG favored the acquisition of CPD:

> We knew Chemetron already a lot of years as a competitor with very strong market penetration and a good product line, a product line which was able to supplement our own product line in organic pigments and would in addition to that give us access to the processes used in the United States in the printing ink industry starting from flushed colors . . . . It would also give us domestic manufacture facilities . . . .

(Tr. 6224).

504. Dr. Kohnle of BWC testified that the acquisition of CPD would give BWC a domestic facility to manufacture pigments, a strong marketing and sales force and flushing technology. (Tr. 4453–55). **[132]**

505. The following documents in evidence, also describe the advantages of the CPD acquisition as perceived by BWC: CX 964A [***] CX 957C [***] RX 4065D [***] CX 903G. [***] CX 967EE–FF [***]

506. At the time of the acquisition, BASF management estimated the additional investment needed to make CPD operational at $11–17 million. Dr. Mecke of Sparte CP's economic evaluation division, together with some members of his team from BWC and BASF AG, participated in a survey of CPD's facilities in May, 1978. (Tr. 4215–19). He testified that the team's work was rushed because their superiors wanted to have their report at a specified time in order to make a decision regarding the acquisition, particularly because of the presence of other companies interested in acquiring CPD. The time he spent analyzing the CPD acquisition was two weeks, relying on information provided to him by CPD. (Tr. 4217–18, 4221, 4225, 4229–30).

507. Dr. Hahn of BASF also testified that prior to the acquisition of CPD, BWC anticipated a total additional investment of $17

million, based on estimates contained in CPD's five-year plans which BWC took at face value. (Tr. 4021–23). BWC did not have time to do much checking because ALI required a quick decision inasmuch as other companies had expressed interest in acquiring CPD. (Tr. 4018).

508. Dr. Kohnle of BWC testified that CPD initially thought that $11 million for mandatory capital investments and $6 million for minor debottlenecking and expansion would be needed for CPD. (Tr. 4456). *Also see* Muench 3840; Albers 6224–25.

509. Dr. Mecke stated that his analysis (CX 967) showed CPD to be a profitable corporation (Tr. 4227) and a favorable profit picture for the five-year period following the acquisition, 1978–1982. Dr. Albers testified that it was felt that within three years BWC would be able to cover its necessary investment of $11 million, interest on its loans and would make a profit. (Tr. 6245). Mr. Muench testified that [***] (Tr. 3934). [***] **[133]**[***]

510. After the acquisition of CPD, a combined BASF/BWC task force investigated the capital needs of Huntington and Holland plants in detail and discovered that the original estimate made prior to the acquisition was not adequate. (CX 659; Kohnle 4457–58).

511. Mr. Muench, head of Sparte CP, testified that it became clear to him that [***] (Muench 3843–44).

512. Dr. Albers of BASF's Vorstand also testified that a post-acquisition study team came up with a much higher capital estimate than had been projected, primarily because of the conditions discovered at the Huntington plant. (Albers 6225). He stated that there have been capital expenditure proposals in the range of $60 million to $100 million and that in his view this is an amount BWC can never consider for the purpose of rehabilitating the acquired facilities. (Albers 6226).

F. *Other Firms In The Organic Pigment Market*

513. The following firms are generally recognized as worldwide leaders in organic pigments: Hoechst AG, Bayer AG, BASF AG, CIBA-GEIBY Limited, ICI, DuPont, Sun, Sandoz, Dainippon, Dainichiseika and Toyo. (Schober 1667; Wittemore 1990–91; Geiss 2074–75; Parker 4969).

514. In the United States organic pigment market, the member firms fall within one of three subgroups, depending upon such factors as the history, market share, the scope and depth of product line, product quality, technological and marketing capabilities and financial resources of each firm. At the time of the acquisition challenged herein, the upper-tier firms included Sun Chemical, DuPont, CPD, American Hoechst, and CIBA-GEIGY; the second or middle-tier firms included American Cyanamid, Harmon Colors,

Hilton-Davis and Hercules; and the lower-tier firms included BWC and other remaining smaller firms. (Schober 1667). More often than not, the [134]market studies and strategy documents in evidence discuss the activities and plans of these firms. They generally regard themselves as the significant competitors in the organic pigment market. (*E.g.,* CX 212Y–AA; 272M; 2047K–L; 3010FFF–LLL; 3106B–EEE; 3215L–P; 3302B–C; 3418W–AA). *Also see* CX 1968T–U. BWC is generally considered a small factor in terms of sales. However, because BASF/BWC is considered a world leader, it is discussed often in market studies and strategy documents of the industry firms. (CX's 2036G; 3223H).

515. There are also a number of smaller but fast-growing firms in the organic pigment market. They include Magruder Color Company, Inc., Harshaw Chemical Co., Ridgway Color and Chemical Co., Apollo Colors, Inc., Pope Chemical and others. Their organic pigment sales are less than $10 million, accounting for about 2–3% of the industry sales. (CX 1; 3010TTT, UUU, AAAA; 3418Z–AA; 3106J, L, S, AA–CC). Also, their product lines are smaller than those of the larger firms and most of them specialize in the printing ink end-use segment of the industry. F. 556–69, *infra.*

516. Many industry firms occupy somewhat specialized positions within the industry in terms of the pigment product forms they sell and the end-use industries they serve. The most striking example is the group of firms which sell almost exclusively or predominantly flushed pigments to the printing ink industry. This group includes CPD, Hilton-Davis, Magruder, Apollo and Pope. Another group of firms have strong positions in specialty or high-performance pigments and sell primarily to the automobile coating and plastics industries. That group includes DuPont, American Hoechst, CIBA-GEIGY, Harmon and BWC. F. 524–69, *infra.*

517. Some competitors in the organic pigments market also have leading positions in particular pigments. (CX 3007T (schematic diagram); 3609I). DuPont leads in the production and sale of quinacridones and alpha-type phthalocyanines. Sun Chemical is the leader in diarylides and, with DuPont, shares the lead in beta-type phthalocyanines. (Whittemore 1943–44). American Cyanamid leads in lithol reds. (McKenzie 3415B, 6943–44). Chemetron leads in alkali blue and C-Amine based azo reds. (CX 2052C, L–M). Harmon leads in perylene pigments. (CX 785F; 910C–D). Hoechst is recognized as the leader in hansa yellow pigments.

518. Testifying as complaint counsel's expert witness on rebuttal, Dr. David Kamerschen, Distinguished Professor of Economics at the University of Georgia and a noted industrial organization economist,

stated that the organic pigments market is divided into two separate and identifiable groups of competitors, major or upper-echelon companies and minor or lower-echelon firms. These groups are distinguishable based upon the following characteristics: the size and capital base of the company; market share; production capabilities; research and development commitment; marketing [135]organization and coverage; breadth and quality of the product line; vertical integration; and experience in the field of organic pigments or related colorants. (Kamerschen 11,089–90). The major or upper-echelon firms in the organic pigments market at the time of the acquisition were: Sun Chemical, DuPont, American Hoechst, CPD, American Cyanamid, CIBA-GEIGY (including Hercules), Harmon (subsidiary of Rhinechem Corp., which is a subsidiary of Bayer AG) and Hilton-Davis (a division of Sterling Drug Inc.). Regarding BWC, Dr. Kamerschen stated that, although BWC was a lower-echelon firm in terms of market share, it possessed the characteristics of an upper-echelon firm because it is owned by BASF AG, a recognized world leader in dyestuffs and pigments. (Kamerschen 11,098–99).

(1) *Sun Chemical Co.*

519. In 1977, Sun Chemical Co. was the top-ranking firm in the organic pigment market with sales in excess of [***] and a [***] market share. (CX 1). It also ranked first in phthalocyanine pigments. (CX 3). Sun Chemical is one of the three United States organic pigment manufacturers (the other two being DuPont and CPD) that have exported pigment products to Europe. (CX 704DD; 769III; 3004M; 3882B).

520. As of 1977, Sun Chemical manufactured both specialty and conventional organic pigments, including the following chemical types: hansa yellows, diarylide yellows, dinitraniline orange, pyrazolone oranges and red, toluidine reds, Red 2B, lithol reds, BON reds, lithol rubines, BON Maroons, rhodamines, quinacridones, carbazole dioxazines, pigment scarlet, phthalocyanine blues and phthalocyanine greens. In all, Sun manufactured more than 34 different types of organic pigments. (Whittemore 1911–12; Stipulation dated January 4, 1982, Exhibit 1, at 17–18). Sun is generally considered to have one of the broadest product lines in the organic pigments industry (CX 212Y; 3004M; Malchick 3080–81) and is a recognized leader in beta phthalocyanine blues, diarylide yellows, hansa yellows and azo reds (*e.g.*, BON, Red 2B, lithol and red lake C). (CX 3418X; Whittemore 1943–44). Sun is the leading producer of flushed pigments (CX 1958T; 3302B; 3418X) and also sells pigments in dry form and in aqueous dispersions. (CX 2047K; 3010LLL; 3801K; 3418X; Whittemore 1911–12).

521. Sun Chemical's domestic organic pigment manufacturing facilities are located in Rosebank, New York (for azo and phthalocyanine pigments); Newark, New Jersey (for perylenes and quinacridones); Cincinnati, Ohio (for azos, carbazole violets, and phthalocyanines); and Muskegon, Michigan (for diarylide yellows). (CX 922F; 3216J–K). The facility at Muskegon cost about $12 million and commenced production of diarylide pigments in December 1978. (Whittemore 1914; 1916). Sun Chemical is known for its efficient, **[136]**large scale production of conventional pigments which are sold at competitive prices.

522. Sun Chemical has a large, aggressive, national sales force (CX 1958T; 2047L; 3004M; 3010LLL; 3302B), and markets its products primarily to the printing inks industry, but also to the automotive coatings and plastics industries. (CX 2047L; 3010LLL; 3302B; Panush 2252). Although Sun purchases all of its intermediates (CX 2047K–L; 3010LLL; 3121; 3215L; 3302B), it is forward integrated. Sun owns General Printing Ink ("GPI"), a large worldwide producer of printing inks. (CX 922E; Whittemore 1910–11). GPI is a large consumer of Sun's organic pigment products. (CX 922E; 2047L; 3004M; 3302B; 3418X).

523. Sun Chemical's research and development expenditures have increased steadily from 1975 through 1979. In 1978, Sun spent more than [***] million on research and development. (CX 3120). The research and development department works on product synthesis new to Sun's line, and analyzes competitive products and modifies or improves existing products. (Smith 1293–94; 1444–45). It is organized into [***] (Smith 1438–39). Although Sun engages in research related to the development of new chemical structures, it has [***] (Smith 1442–43). Sun has been successful in developing and commercially introducing specialty organic pigments, [***], which were new to Sun's product line, and is recognized as having excellent technical capability and product quality. (CX 272M; 1958T; 2047K–L; 3004M; 3801K; Smith 1443–44).

(2) *DuPont*

524. DuPont, which had worldwide sales of approximately $10.6 billion in 1978, manufactures and sells organic pigments through its Colored Pigments Division. (Lipton 1592–93; Stipulation dated February 10, 1982). In 1977, DuPont was the second ranking firm in the United States organic pigment market, with sales in excess of [***] and accounted for about [***] of the market. (CX 1). It also ranked second in phthalocyanines, with sales of more than [***] million and a share of [***] (CX 3). It is one of the three domestic organic pigment manufacturers that exports organic pigments to

Europe. (CX 769III). DuPont also manufactures inorganic pigments and dyestuffs. (CX 588D–E; 3010JJJ).

525. In 1977, DuPont manufactured specialty and conventional organic pigments, including the following chemical types: hansa yellows, quinacridones, naphthol reds, toluidine reds, Red 2B, BON [137]reds, lithol rubines, rhodamines, methyl violets, phthalocyanine blues and greens, and nickel azo yellows. In all, DuPont manufactured more than 28 different types of organic pigments (Stipulation dated January 4, 1982, Exhibit 1, at 7)[7] and is the recognized leader in the production of quinacridones, hansa yellow, alpha phthalocyanines, and beta phthalocyanines. (CX 3010JJJ; 3418W; Whittemore 1943–44). DuPont's organic pigments are sold in both dry form and in aqueous dispersions. (CX 3010JJJ; 3418W; 3801L).

526. DuPont, which has one of the industry's largest sales forces and a nationwide network of warehouses (CX 3004M; 3106P), is one of the leading organic pigments suppliers to the trade sales paint and coating (including automotive) and plastics end-use segments of the market. (CX 1958T; 3106P; 3302B; Panush 2252).

527. DuPont is integrated backwards, particularly with respect to [***] (CX 704D; 2047K; 3004M; 3010JJJ; 3227A–B; 3302B). In addition, DuPont's Paints Division, which manufactures industrial and architectural (trade sales) coatings, represents a large captive outlet for the organic pigments produced by DuPont's Colored Pigments Division. (CX 3004M; 3302B; 3418W; Schober 1660–61).

528. Competitors in the organic pigments market generally considered DuPont to have strong technical service and research and development capabilities. (CX 272M; 704C–E; 2047L; 3004M; 3010JJJ; 3106P–Q). Since 1974, [***] (CX 3227A). DuPont's reputation throughout the organic pigments industry is outstanding, and its organic pigments are universally considered to be of high quality. (CX 272M; 1958T; 2047K; 3106P–Q).

(3) *American Hoechst Corp.*

529. American Hoechst Corp. ("American Hoechst") is a wholly-owned subsidiary of Hoechst AG, a West German company. (Geiss 2053). Hoechst produces petrochemicals, basic organic and inorganic chemicals, fibers, pharmaceuticals, agrichemicals, and veterinary products, resins and plastics, dyes and pigments, paints, reprography, and cosmetics. (CX 3517D). In 1978, Hoechst AG had worldwide sales of approximately $12 billion. (Stipulation dated February 10, 1982). CIBA-GEIGY estimated 1976 Hoechst AG worldwide [138] sales of dyes and pigments to be about $556 million, of which about

[7] The Color Index Names listed in the Stipulation can be identified according to chemical type by reference to F. 46, *supra*.

$110 million to be sales of pigments. (CX 3517E (converted to dollars based upon the 1976 exchange rate of 39.737 cents per DM)). Hoechst AG has organic pigments manufacturing facilities in West Germany, the United States, Mexico, Brazil, Australia and India. (CX 3517F–G).

530. Hoechst AG markets its organic pigments in the United States through the Pigments Department of American Hoechst Corp., which also manufacture organic pigments in the United States at Coventry, Rhode Island. (CX 3517F; Geiss 2055–56). In 1977, American Hoechst was the fourth-ranking competitor in the United States organic pigment market, with sales in excess of [***] million and a [***] market share.

531. American Hoechst began its organic pigments business in the United States in 1954, through the acquisition of Metro Dyestuffs, a company which manufactured dyestuffs, and Carbic Color, a distributor of textile dyes and chemicals. (Geiss 2063–64; Counihan 5533–35, 5674–76). In 1957, American Hoechst began producing organic pigments on a limited basis at its dyestuffs facilities in its Rhode Island Works ("RIW") in Coventry. (Geiss 2064–65). Over the ensuing years, Hoechst AG transferred some of its chemists and technical personnel to American Hoechst in the United States. (Geiss 2065). In 1970 and 1975, American Hoechst built new organic pigments (primarily azo) production facilities at the Rhode Island Works. (CX 715YYY; Geiss 2089).

532. Heinz Geiss, Vice-President of American Hoechst's Industrial Chemicals Division, estimates that American Hoechst's share of the United States organic pigment market has more than doubled since 1970, and considers this growth to have been the result of Hoechst AG's product line and research support, combined with American Hoechst's domestic production facilities, research and development effort, technical service, and sales organization. (Geiss 2067).

533. American Hoechst markets a broad line of organic products in the United States, including: hansa yellows, diarylide yellows, azo reds and oranges, quinacridones, perylenes, carbazole dioxazines, vat pigments, benzimidazolones, lithol rubines, and pyrazolones. (Geiss 2056; Stipulation dated January 4, 1982, Exhibit 1, at 1–2). American Hoechst imports about 50% of the organic pigments it sells in the United States on a dollar value basis. (Geiss 2058–59). It domestically manufactures about 75% of its organic pigments (on a poundage basis), including diarylide and hansa yellows, naphthol (azo) reds, dinitraniline orange, and carbazole dioxazine violets. (Geiss 2056–59). American Hoechst markets more than [***] different types of

organic pigments in the United States (Stipulation dated January 4, 1982, Exhibit 1, at 1–2), including [***] (which it purchases from BASF in West Germany). (Geiss 2093–94, 2125; Aschner 5367–68). American Hoechst sells organic pigments in all forms except in flushed colors. (CX 272M; 3418Y; 3801K). **[139]**

534. American Hoechst, known as the "house of yellows" because of its Yellow HR and Yellow FGL pigments (CX 212Y; Geiss 2077), sells its products, both imports and domestic production, on a nationwide basis and is strongly represented in all end-use segments of the industry, including automotive coatings. (CX 1958T; 3106H–I; Schober 1661; Panush 2252).

535. Hoechst AG and American Hoechst are both vertically integrated, manufacturing about [***] of their organic pigments intermediates requirements. (CX 3034; 3036; 3223X–Y).

536. Hoechst AG and American Hoechst are committed to organic pigments research and development. (CX 704E–F; 3302B; 3517J–K). In 1978, American Hoechst spent about [***] on organic pigments research and development in the United States and Hoechst AG, about [***] million in West Germany. (CX 3033; 3035B). The basic synthesis and new development of products is done at Hoechst AG while product modification or development for the United States market is performed at American Hoechst. (Geiss 2067–69). Two patented products which aided American Hoechst's growth in the United States—Yellow HR and FGL — were developed by Hoechst AG in Germany. (Geiss 2077).

537. American Hoechst is regarded as an innovator and is generally recognized as having excellent research and development and high quality products. (CX 272M; 769OOO; 1958T; 2047L; 3106H; 3801K; Schober 1674–76). It is planning further expansion of its organic production capability in the United States. (Geiss 2090–91).

(4) *CIBA-GEIGY Corporation (CIBA-GEIGY/U.S.)*

538. CIBA-GEIGY Corp. is the United States subsidiary of CIBA-GEIGY Limited, a Switzerland-based company which had worldwide sales of about $5 billion in 1978. (Papillo 1768; Stipulation dated February 10, 1982). CIBA-GEIGY Limited, which is one of the world's largest manufacturers of pigments, had worldwide organic pigments sales of about $160 million in 1976 (based upon an exchange rate of 40.013 cents per Swiss Franc). (CX 3508I). In 1977, CIBA-GEIGY Corp. was the sixth ranking firm in the United States organic pigments market, with sales of about [***] million and a [***] market share. (CX 1).

539. CIBA-GEIGY Limited markets over 600 organic pigment products in Europe, of which about 100–200 are sold in the United

States. (Papillo 1768–69). CIBA-GEIGY Corp. imports organic pigments, such as diarylide yellows, phthalocyanine blues and greens, [140]lithol rubines, disazo condensation yellows, oranges and reds, azo methine yellows, and isoindolinones. (Stipulation dated January 4, 1982, Exhibit 1, at 6; CX 4018). As of 1977, CIBA-GEIGY Corp. imported most of the products it sold in the United States. (CX 3106O; Papillo 1768). Because CIBA-GEIGY's product line in the United States is heavily oriented towards the high-performance end, its sales were primarily for use in plastics (especially fibers) and industrial coatings (including automotive coatings). (CX 212Z; 3010FFF; 3106O; 3504D; Panush 2252; Schober 1645, 1661).

540. CIBA-GEIGY Limited, like the other major European organic pigments manufacturers, is heavily committed to research and development. (CX 3215M; 3515; Papillo 1783–84). In 1977, its total organic pigments research and development expenditures were $10.6 million (between 5–8.4% of sales). (CX 3515A).

541. CIBA-GEIGY Limited has been known for its high level of product quality and technical capability, particularly with respect to the development of [***] (CX 272M; 769NNN; 3010FFF; 3106O; 3418; 3801L).

542. In 1979, CIBA-GEIGY Corp. acquired the pigment business of Hercules, Inc. (CX 3215M; 3302B). Hercules, which manufactured organic and inorganic pigments (CX 3010GGG; 3215M; 3418Y), was the fifth ranking firm in the organic pigment market in 1978, with sales of about [***] and a market share of [***] (CX 2). Hercules had a fairly broad product line. (Stipulation dated January 4, 1982, Exhibit 1, at 9–10). Its organic pigments were sold in dry form, aqueous dispersions, and non-aqueous dispersions (CX 3010GGG; 3801J) to most end-use segments of the industry, with a heavy emphasis on plastics. (CX 3010PPP). Hercules had a reputation for producing quality pigments (CX 272M) and was one of the few manufacturers to successfully market easily dispersible pigments. (CX 3106T; 3418Y; Schober 1675). By acquiring Hercules, CIBA-GEIGY Corp. obtained a domestic manufacturing facility for organic pigments and a large, well-established customer base. (CX 3010GGG; 3215M; 3302B).

(5) *American Cyanamid Co.*

543. American Cyanamid Co., which produces organic pigments, inorganic pigments, and dyestuffs (CX 1958T; 3010ZZZ), was the fifth-ranking manufacturer of organic pigments in 1977, with sales in excess of [***] and a market share of [***] (CX 1). American Cyanamid was also the fourth-ranking producer of phthalocyanine pigments. (CX 3).

544. In 1977, American Cyanamid's product line consisted of

phthalocyanine blues and greens, carbazole dioxazine, methyl violets, PMA greens and blues, napthol reds, toluidine reds, Red 2B, lithol [141]reds, BON reds, and lithol rubines. (Stipulation dated January 4, 1982, Exhibit 1, at 1; CX 3010ZZZ, 3215O). Competitors considered American Cyanamid to be an industry leader (CX 2047K), particularly in the production of azo red pigments and phthalocyanines used in printing inks. (CX 212Z; 2047L; 3010III, ZZZ; 3106F; 3215O; 3302C; 3418X). American Cyanamid considered itself to be a price leader with respect to certain azo red pigments (CX 3415B; McKenzie 6943–44) and expanded its azo and phthalocyanine production facilities in the 1970s in order to increase its market position in these products. (CX 708N; 2047L; 3106F; 3415A–C). American Cyanamid produces the basic intermediates it uses to manufacture azo red and phthalocyanine pigments (CX 3010III, ZZZ; 3023C; 3223Y; 3302C; 3413; 3415C) and expanded its production capacity of intermediates used to manufacture azo red pigments in 1976. (CX 3215O).

545. American Cyanamid's R&D expenditures averaged approximately [***] annually between 1974 and 1979. (CX 3223E; 3414). American Cyanamid developed a reputation for quality products and good technical service support. (CX 212Z; 272M; 3302C).

546. In October 1980, American Cyanamid withdrew from the phthalocyanine business and sold its related technology and business to Sun Chemical. (CX 3023; 3118).

(6) *Harmon Colors Corp.*

547. Harmon Colors was a subsidiary of Rhinechem Corp., which is a subsidiary of Bayer AG of West Germany. Effective January 1, 1981, Harmon Colors became the Pigments Department of the Dyes and Pigments Division of Mobay Chemical Corp., which is also a subsidiary of Rhinechem. (Schober 1637–38; 1675).

548. Bayer AG, one of the world's largest chemical companies (CX 2047E; 3215N), had worldwide sales (of all products) in excess of $11.3 billion in 1978. (Stipulation dated February 10, 1982). In the United States, Bayer markets dyestuffs through its Verona subsidiary (CX 3215N–O) and organic pigments through Harmon Color which it acquired from Allied Chemical in 1977. (CX 912A; 3986C). In 1977, Harmon Color was the seventh-ranking firm in the United States organic pigments market, with sales in excess of [***] and a market share of [***] (CX 1).

549. Harmon Color's product line consists of organic pigments (with the exception of two inorganic pigment preparations). (Schober 1645). Harmon Color manufactured organic pigments such as hansa yellows and oranges, diarylide yellow and oranges, pyrazolone reds,

phthalocyanine blues and greens, Red 2B, perylenes, quinacridones, carbazole dioxazine, and thioindigo reds. (Stipulation dated January 4, 1982, Exhibit 1, at 14; CX 910C; 3301B; **[142**]3304B; 3418Z). Most of Harmon Color's sales are to the coatings industry, primarily for automotive coatings. (CX 3305F). Harmon Color is considered to be one of the leading manufacturers of high-performance organic pigments used in automotive coatings and paints. (CX 212Z; 908B; Panush 2252, 2300; Schober 1645, 1660–61). It manufactures more than 50% of the intermediates it uses to produce organic pigments. (CX 3303).

550. Harmon Color's research and development group is maintained separately from its technical service group and sales force. (Schober 1648). The research and development group is responsible for the development of new products, product modifications, and process improvements and maintains contact with end-users in order to formulate new ideas and to assist in the sales and service associated with the introduction of Harmon Color's pigments. (Schober 1648). Harmon Color expended about [***] on research and development in 1978. (CX 3309). Harmon Color's technical services group is responsible for evaluating competitive products, and product testing, and maintains contact with customers in order to explain application technology to the end-users. (Schober 1647–48).

551. Harmon's nationwide sales force consists of well trained, technically-oriented personnel. (Schober 1646–47). They are regularly provided with the results of technical testing and evaluation of competitive products. (Schober 1658–59). Harmon Color is recognized as an innovator and producer of high quality products. (CX 908C; 910B–C; 3106R; 3801J). It is one of the few companies that has successfully developed chrome replacement organic pigments. (Schober 1674–75).

(7) *Hilton-Davis Division Of Sterling Drug Inc.*

552. Hilton-Davis, a division of Sterling Drug Inc. (CX 922D; 929D), manufactures organic pigments, inorganic pigments, and dyestuffs. (CX 920A; 921D; 3010HHH; 3106U). In 1977, it was the ninth-ranking manufacturer of organic pigments, with sales in excess of [***] million and a market share of [***] (CX 1). It ranked seventh in phthalocyanines. (CX 3).

553. In 1977, Hilton-Davis manufactured hansa yellows, diarylide yellows and oranges, dinatraniline and pyrazolone oranges, Para reds, toluidine reds, lithol reds, lithol rubine, Red lake C, methyl violets and PMA blues, and phthalocyanine blues and greens. (Stipulation dated January 4, 1982, Exhibit 1, at 16–17). Hilton-Davis sells organic pigments on a national basis as dry powder, flushed,

and in aqueous dispersions. (CX 1958T; 2047K–L; 3010HHH; 3801J). Its products are purchased by all end-use industries. (CX 921C–D; 2047L; 3106U). Hilton-Davis is considered to be strong in flushed colors. (CX 212Z; 1958T; 2047L; 3418Y). [143]

554. Hilton-Davis spent an average of some [***] on research and development related to organic pigments between 1974 and 1979. (CX 3863). Hilton-Davis produces about [***] of the intermediates that it uses in the manufacture of its organic pigments. (CX 1958T; 3106U; 3864).

555. Late in 1978, [***] BWC entered into the CPD acquisition agreement with Allegheny Ludlum Industries in November 1978. F. 499–500, *supra*.

(8) *Magruder Color Company, Inc.*

556. Magruder Color Company (Magruder) is privately-owned and is one of the fastest growing organic pigment manufacturers in the United States. (Weissglass 2520; Counihan 5555–56; 5782–83). In 1977, Magruder was the eleventh-ranking firm in the organic pigment market, with sales of about [***] and a [***] market share. (CX 1).

557. Magruder's product line consisted of conventional organic pigments, including rhodamines, Red 2B, BON Red, lithol rubines, and methyl violet. (Stipulation dated January 4, 1982, Exhibit 1, at 12; Weissglass 2486). In 1978, Magruder began producing phthalocyanine blue pigments. (Weissglass 2486). By the acquisition of Indol in 1980, Magruder added diarylide yellows to its product line. (Weissglass 2490–91). Although Magruder sells some of its organic pigments in dry form, it is primarily a manufacturer of flushed colors sold to the printing ink industry. (Weissglass 2487; 2542; Malchick 3075–77; CX 3418AA). The Indol acquisition gave Magruder an opportunity to extend its pigments sales to the textile industries and plastics. (Weissglass 2488; 2495–98).

558. Magruder does not manufacture any of the intermediates it uses to produce organic pigments. (CX 3822C; Weissglass 2523). It purchases many of its organic pigments from others in dry form, flushes them and sells them to the printing ink industry. (Weissglass 2489; Counihan 5757–58; CX 3822C–E).

559. Magruder engages in some research and development, but it does not have the technological capability to manufacture high-performance pigments which require sophisticated chemical know-how. (Weissglass 2502–03). Magruder focuses its development work on improving its own products or matching the products offered by its competitors. (Weissglass 2503–05; 2499–2500). [144]

(9) *Apollo Colors, Inc.*

560. Apollo Colors, Inc. (Apollo) is a small organic pigments manufacturer with less than [***] of the organic pigments market. (CX 1; 3010TTT). Apollo manufactures diarylide yellows, BON Red, lithol rubine, and phthalocyanine blue pigments. (Stipulation dated January 4, 1982, Exhibit 1, at 3). Its pigment sales are all in flushed form. (CX 3010TTT; Counihan 5757–58). Apollo is a regional competitor in the Midwest (CX 3106J; 3418) and has established a small position in the flushed colors segment of the organic pigment market.

561. Apollo purchases all of the intermediates it uses to manufacture organic pigments. (CX 3010TTT; 3901B). Apollo engages in some research and development and has spent an average of [***] per year on research and development since 1974. (CX 3901B).

(10) *Pope Chemical Co.*

562. Pope Chemical Co. (Pope) manufactures phthalocyanine blue and green, and diarylide yellow organic pigments in flushed form. (Stipulation dated January 4, 1982, Exhibit 1, at 13; Giniger 7228–29; 7206). Pope also manufactures some pigment dispersions using organic pigments which it purchases from competitors. (Giniger 7206). Its products are sold to the printing ink industry. (Giniger 7227–28; 7229). It considers its primary competitors to be Apollo and Magruder. (Giniger 7229).

563. In 1977, Pope's organic pigment sales were less than [***] and its market share was below [***] (CX 1; 3106BB). Pope's sales have increased since 1977 (Counihan 5560; Malchick 3354–56), and on a dry toner basis, its 1981 sales would be valued at about [***] (Giniger 7224).

564. [***] (Giniger 7228; CX 3106BB; 3418AA). Pope Chemical's research and development function consists primarily of matching competitive products and fulfilling the specific needs of its customers. (Giniger 7208–09).

(11) *Harshaw Chemical Co.*

565. Harshaw Chemical Co. (Harshaw) manufactures organic and inorganic pigments. (CX 3010AAAA). In 1977, Harshaw's organic **[145]**pigments sales were less than [***], making it the twelfth-ranking firm in the organic pigment market, with a share of [***] (CX 1).

566. In 1977, Harshaw's organic pigments product line consisted of conventional organic pigments, including hansa yellows, diarylide yellows and oranges, azo reds, and phthalocyanine blue. (Stipulation dated January 4, 1982, Exhibit 1, at 8–9; CX 3010AAAA). Its organic

pigments products were sold primarily to the trade sales paints and industrial coatings end-use segments of the industry. (CX 3010AAAA; 3302C; 3418Z).

567. Harshaw purchases all of the intermediates that it uses in the manufacture of organic pigment products. (CX 3845). Harshaw's annual research and development expenditures averaged at about [***] between 1974 and 1979. (CX 3842).

568. [***] Subsequent to the preparation of the study (CX 3846), James Canon, then General Manager of Harshaw's organic pigments business, recommended against it. (Canon 12519–22; 12534–35).

569. Other small organic manufacturers with market shares around 2% or less, such as Borden and Ridgway, produced limited amounts of organic pigments (diarylide yellows, azo reds, and phthalocyanine blue) primarily for captive consumption by affiliated printing inks producers. *See* CX 3010UUU; 3106L, CC; 3418Z; 3931. Ridgway is a division of Sinclair & Valentine, a printing inks producer which consumes about 70% of Ridgway's organic pigment production. (CX 3106CC; 3418Z; 3931). Borden's organic pigments are captively consumed by its Levey Division. (CX 3106L; 3418Z).

570. As of 1978, except for Hoechst AG, Bayer AG, and CIBA-GEIGY, no foreign manufacturer of organic pigments has significantly penetrated the United States organic pigment market. *See* CX 1–2. ICI, Sandoz, and the Japanese producers (Toyo, Dainippon, and Dainichiseika) sold a small amount of organic pigments in the United States, but none of these companies has achieved a significant market share.

(12) *ICI Limited*

571. ICI manufactures and sells a wide range of organic pigments, including phthalocyanine blues and greens, diarylide yellows, toluidine reds, flavanthrone yellow, indanthrone blue, and disazo condensations, on a worldwide basis. (Parker 4943–44; CX 769PPP). Considered to be one of the top worldwide producers of organic pigments, ICI is integrated backwards and maintains extensive, **[146]**marketing and technical support staff in many countries. (Parker 4942–45). ICI spends about $3–4 million a year on pigment-related research. (Parker 4940).

572. In the United States, ICI markets phthalocyanine greens, indanthrone blues, and flavanthrone yellows (all of which are imported) through ICI Americas. (Parker 4946; 4962–63; Stipulation dated January 4, 1982, Exhibit 1, at 10). On a dry toner basis, ICI's organic pigment imports into the United States during the period 1977–79 averaged [***] (Parker 4977–78). ICI maintained a staff of about 8 marketing and technical support personnel in the United

States during that period. (Parker 4979). ICI was not considered as a significant competitor in the United States market. (Whittemore 1990–91).

573. As of 1980, ICI had no plans to increase its organic pigments staff in the United States. (Parker 4981–82). ICI has never considered acquiring a United States manufacturer of organic pigments. (Parker 4985). It has never seriously considered *de novo* expansion in the United States organic pigments market. (Parker 4955–56; 4986). In Mr. Parker's view, the profitability of the organic pigment business in the United States is low and would not justify financial and marketing resources that would be required for any ICI expansion. (Parker 4957–62).

(13) *Sandoz*

574. Sandoz AG (Sandoz) is a Swiss manufacturer of organic pigments (CX 769SSS), and had insignificant sales of organic pigments in the United States. (CX 1). Sandoz estimated its U.S. market share to be [***] (CX 3801K). Although Sandoz manufactured a small amount of azo red and yellow pigments in the United States in 1977 (Stipulation dated January 4, 1982, Exhibit 1, at 15–16; CX 3801K), it subsequently closed its New Jersey manufacturing facility. (Counihan 5676–77).

575. Sandoz was among the serious bidders for CPD in May-June 1978 and again in late 1978. F. 301, *supra*.

576. The three largest Japanese manufacturers of organic pigments are Toyo, Dainippon, and Dainichiseika. (Whittemore 1943). In 1967, the Japanese manufacturers began importing phthalocyanine crude into the United States and became the primary source for many phthalocyanine producers in the United States, primarily because domestic supply of crude was limited and the Japanese crude prices were low. (Counihan 5539; Counihan dep. CX 5087ZZ). Dainippon was among serious bidders for CPD in May-June and again in late 1978. F. 301, *supra*. **[147]**

577. The Japanese producers have made attempts to sell finished organic pigments in the United States, with very little success. (Papillo 1890–91; Whittemore 2003–06; Counihan dep. CX 5087AAA–BBB).

578. In 1977 and 1978, [***] negotiated separately, but did not enter into any agreement, with Toyo and Dainichiseika concerning a joint phthalocyanine crude venture in the United States. [***]

VI. THE CHALLENGED ACQUISTION CONSTITUTES A PRESUMPTIVE VIOLATION OF SECTION 7 ON THE BASIS OF MARKET STRUCTURE EVIDENCE

A. *The Rule Of Presumptive Illegality Governing Horizontal Mergers Should Be Applied In This Case*

579. It has been settled, on the basis of case law and established enforcement policy, that a horizontal merger producing a firm with an aggregate market share of 10–12% in an unconcentrated market is a presumptive violation of the amended Section 7 of the Clayton Act and is prohibited, unless it is shown that the market shares are not reliable indicia of the true competitive significance of the merging firms or that the market is likely to perform competitively regardless of the merger. *See* IV Areeda and Turner, *Antitrust Law* (hereafter *"Antitrust Law"*), ¶¶ 909–912 at 29–68 (1980); Sullivan, *Antitrust,* Section 204 a and b at 613–21 (1977); Department of Justice Merger Guidelines, Sections 5–6, 1 Trade Reg. Rep. ¶ 4510 (1980).

580. There is some support for a rule which would permit, in a competitively structured market, the acquisition of firms with 1 or 2% of the relevant market by firms with market shares of no more than 12–15%, unless it is shown that the market shares of the merging firms considerably understate their competitive significance. *See* IV *Antitrust Law,* ¶¶ 911a, 911f at 60–61, 65–68.

581. There is some authority which holds that a market consisting of 30 firms with market shares ranging from 1 to 15% may be characterized as a competitively structured market for the purpose of raising the aggregate market share threshold level for presumptive illegality from 10% to 15–17%. *See* IV *Antitrust Law,* ¶ 911f at 65–67.

582. There is some support for invoking the *prima facie* rule at a lower threshold level in concentrated industries. One commentator has proposed that any horizontal merger in an industry with 8-firm [148]concentration ratio, of 50% or more and 20-firm ratio of 75% or more (Kaysen and Turner's "Type I oligopoly"), or an industry in which eight (or less) of the 20 (or less) firms control a third of the market, be prohibited unless the merger proponents can "demonstrate the factors which diminish the significance of concentration data." Sullivan, *Antitrust,* at 619–21 (1977).

583. "Concentration ratio" is the aggregate percentage share of the market universe accounted for by a specified number of the largest firms in the market. The most commonly used concentration ratios are the 4-, 8- and 20-firm ratios.

B. *The Organic Pigment Market Is Concentrated*

584. In 1977, total industry sales of organic pigments (based upon the dry toner value of sales, captive consumption, imports and exports) were approximately $366,714,049. (CX 1). CPD's sales were approximately [***], making it the third-ranking firm in the organic pigment market with a market share of [***] BWC ranked thirteenth, with sales of approximately [***], or a market share of [***] (CX 1). About 32 firms reported organic pigment sales for 1977 in the FTC Industry Survey.

585. In 1978, total industry sales of organic pigments were $416,951,537. CPD's sales increased to about [***] for a market share of [***], which made CPD the fourth-ranking firm in the market. BWC's sales in 1978 were about [***] for a market share of [***] and it ranked sixteenth in 1978. (CX 2). About 34 firms reported organic pigment sales for 1978 in the FTC Industry Survey.

586. In 1979, total industry sales of organic pigments were about $462,766,164. The combined sales of BWC/CPD were about [***], which made BWC after the acquisition the third-ranking firm with 10.5% share of the market. (RX 2103 (revised 8/28/81)). About 43 firms reported organic pigment sales for 1979 in the FTC Industry Survey.

587. The following table shows the market shares of BWC and CPD, before and after the acquisition, in the organic pigment market:

Year	Universe	BWC	CPD	Combined
1977	$366,969,508	[***]	[***]	11.57%
1978	417,057,858	[***]	[***]	10.63%

Source: CX 1–2. [149]Thus, the 1978 merger produced a firm with an aggregate share of 10.63% in the organic pigment market.

588. The following table shows the market shares of BWC and CPD, before and after the acquisition, in the alleged phthalocyanine submarket:

Year	Universe	BWC	CPD	Combined
1977	$ 83,319,843	[***]	[***]	16.78%
1978	86,874,408	[***]	[***]	14.52%

Source: CX 3–4. Thus, the merger would have produced a firm with an aggregate share of 14.52% in the alleged submarket. The number of firms reporting phthalocyanine pigment sales in the FTC Industry Survey was about 30 for 1977 and 34 for 1978.

589. The organic pigment market in the United States is

concentrated. The 4- and 8-firm concentration ratios were 49.2% and 71.4%, respectively, for 1977, 47.3% and 71.2%, respectively, for 1978, and 49.6% and 76.0%, respectively for 1979. The 20-firm concentration ratios exceeded 90% for each of the years. (CX 1-2; RX 2103). Thus, the organic pigment market falls within "Type I oligopoly," or between "loose oligopoly" and "tight oligopoly," on the basis of the number and size distribution of sellers in the Kaysen and Turner industry classification. *See* Kaysen and Turner, *Antitrust Policy,* at 30, 72 (1965).

590. For 1977 and 1978, the 4-, 8- and 20-firm concentration ratios of the organic pigment market were somewhat higher than the corresponding average concentration ratios for all manufacturing industries in the United States. *See* Kamerschen 10,877–82.

591. Mr. Glassman and Dr. Adelman, respondent's expert witnesses, testified that the sales-weighted concentration ratios for 5-digit industries were more meaningful than the unweighted ratios for 4-digit industries. (Glassman 8694–98; Adelman 10,251). For 1977, the 4-firm concentration ratio in the "Synthetic organic pigment lakes and toners," SIC Code 28653 (the 5-digit industry corresponding most closely to organic pigments) was about 48%, higher than the weighted average concentration ratio for all 5-digit industries, which was about 46%.

592. The Herfindahl Index, another measure of market concentration, is the sum of the squares of the market shares of each **[150]** and every firm in the market. While concentration ratios do not disclose any information regarding the firm-size distribution in terms of market shares, the Herfindahl Index increases with a reduction in the number of firms or increasing firm-size disparity in terms of market shares among a given number of firms. *See* IV *Antitrust Law,* ¶913a2 and 913c2, at 76, 79–80.

593. Substantial authority regards Herfindahl Index as superior to concentration ratios. Herfindahl Index is readily adaptable as of general presumptive test of mergers based on the relative size of the merging firms. *See* IV *Antitrust Law,* ¶¶913a2 and 913c2. *Also see* Adelman 12,244, 12,336.

594. There is authority which suggests that for a presumptive test of horizontal mergers a Herfindahl Index of 0.13 (or more) is a reasonable threshold in a highly concentrated market. *See* IV *Antitrust Law,* ¶¶913, 913c2 at 74, 79–80.

595. On the basis of RX 9072 (revised) prepared by Dr. Adelman to show the Herfindahl Index for the organic pigment market for the years 1977, 1978 and 1979, Dr. Adelman, on surrebuttal, expressed an opinion that the organic pigment market is competitively

structured. (Adelman 12,340). According to RX 9072 (revised), the estimated Herfindahl Indices for 1977, 1978 and 1979 are 0.081, 0.078 and 0.085, respectively. For the purpose of these estimates, Dr. Adelman assumed that all the firms in "All others" category had equal shares for each of the three years. (Tr. 11,781). However, the small fringe-firms that are difficult to identify would not affect the index significantly. And the effect of a given merger on the Herfindahl Index would be the same regardless of the number and size distribution of the other firms in the market. *See* IV *Antitrust Law,*¶913a2 at 76.

596. In 1977, CPD was the third largest firm in the alleged phthalocyanine pigments submarket with sales of about [***] and a market share of [***]; BWC ranked sixth in the market with sales of about [***] and a share of [***]. The value of all domestic production and imports of phthalocyanine pigments was about $82,955,316. (CX 3). In 1978, CPD retained its third rank, with sales of about [***] and a market share of [***]; BWC ranked seventh with sales of about [***] and a share of [***]. In 1978, the value of domestic production and import of phthalocyanines was about $86,793,000. (CX 4). In 1979, that figure substantially increased to about $120,096,000. BWC/CPD became the third-ranking firm, with about 12.4% of the submarket. For the three years, Sun Chemical and DuPont occupied the top two ranks, accounting for 43 to 46% of the submarket. (RX 2104 (revised)).

597. The alleged phthalocyanine pigment submarket is more concentrated than the organic pigment market. The two-, four-, and **[151]**eight-firm concentration ratios in the alleged submarket for the years 1977, 1978 and 1979 were as follows:

	1977	1978	1979
Two-firm	45.8%	44.1%	43.4%
Four-firm	66.5	63.0	63.7
Eight-firm	86.9	82.2	84.2

Source: CX 3–4; RX 2104A (revised).

598. During the years 1977 to 1979, there was relatively more stability than instability in the ranking among the leading firms in the organic pigment market. *See* CX 1–2; RX 2103a. The top four firms in 1977 (Sun Chemical, DuPont, CPD and American Hoechst) were also the top four in 1978, although CPD and American Hoechst changed positions because of a [***] difference in market share. There was no change in the top two throughout the relevant years. And, the top nine firms in 1977 were also the top nine in 1978, although there were some changes in ranking among the nine. For

1979, due to the BWC/CPD and CIBA-GEIGY/Hercules mergers, there was a new alignment in the top four, as well as considerable shifting in ranking among the remaining firms. *See* RX 2103a.

599. Based on RX 2103 (revised), Mr. Glassman, respondent's expert witness, expressed an opinion that there was "frequent and sometimes extreme changes in the market share rank" in the organic pigment market and that this showed "the existence of competition and the existence of rivalry." (Tr. 8702). Mr. Glassman pointed out that Hercules went from the eighth in 1977 to fifth in 1978 and that Apollo went from sixteenth in 1977 to eleventh in 1979. (Tr. 8703–04). He also expressed an opinion that the existence of such small but growing firms as Magruder, Apollo, Pope, Allegheny, Galaxie and others was likely to exert some destabilizing influence in the market. (Glassman 8714–16).

C. *The Evidence Fails To Show a Discernible Trend Towards Greater Concentration In The Organic Pigment Market*

600. There is substantial authority which holds that even small horizontal mergers should be prohibited if a trend toward greater concentration exists in a partially concentrated market. The rationale is that if a particular merger can clearly be seen as a part of a larger dynamic threating excessive concentration in the market, it should not be permitted. *See* IV *Antitrust Law,* ¶914 at 81–83; Sullivan, *Antitrust* Section 204c at 621–22. **[152]**

601. Section 7 case law and established enforcement policy suggest a rule that if in any period of from five to ten years, the leading firms (from 2 to 8) in a partially concentrated industry have increased their market shares by 7% or more, any merger which increases the share of any significant firm by 2% or more should be prohibited. A more restrictive rule, proposed by Bok in 1960 and based on the aggregate market shares of the largest firms without regard to the degree of concentration or the number of sellers in the market, has not been followed. *See* IV *Antitrust Law,* ¶914 at 81–83; Department of Justice Merger Guidelines, Section 7, 1 Trade Reg. Rep. ¶4510 (1980).

602. The market share evidence in the record does not embrace a period sufficiently long to invoke the rule of presumptive illegality based on any "trend" toward greater concentration. The FTC industry survey covered only a 2-year period from 1976 to 1978. In any event, during that period, BWC's market share remained under 2% and BWC could not have been characterized as a "significant firm."

603. During the late 1970s, the organic pigment industry witnessed a number of acquisitions and partial withdrawals by industry

members. In 1972, Sherwin-Williams Co. discontinued production of phthalocyanines and lithol rubines and sold related formulae and customer lists to Sun Chemical Co. Sherwin-Williams continues to produce alkali blues. (Counihan 5542; CX 953C, G; 702U; 3202N). By 1974, GAF Corporation discontinued production of phthalocyanine pigments. (CX 3202N; 165A; 593C; 702M; Counihan 5542–43).

604. In 1977, Bayer AG acquired Harmon Colors Corp. from Allied Chemical Co. (CX 912A; 3986C). In 1978, BWC purchased from GAF Corporation the production facilities located at Rensselaer, New York and related technology. (RA 133). These facilities had been used by GAF to manufacture a small amount of organic pigment products. (RA 136). In 1979, CIBA-GEIGY acquired the pigment business of Hercules Corporation. (CX 3001C, 240C; Counihan 5553). In February 1980, Magruder acquired the Indol Chemical Division which produces organic pigments from M. Lowenstein & Co. (Weissglass 2482; Counihan 5555; CX 3107X). In 1980, American Cyanamid withdrew from the phthalocyanine business [***] (RX 6153, 6155, CX 3118; Whittemore 1916; 1922–23). [***] (Whittemore 1960–61).

605. On the other hand, the evidence shows a rapid and substantial growth of a number of small firms during the recent past, outpacing the overall industry growth rate. This evidence is [153]inconsistent with a trend toward greater concentration in the organic pigment market. F. 556–69, *supra.*

D. *The Evidence Does Not Show An Undue Reduction In The Number Of Sellers In The Organic Pigment Market*

606. The argument for a rule of presumtive illegality of a given sized merger is stronger when there has been an undue reduction in the number of firms in a market. There is some authority which holds that the critical number is between 10 to 12. *See* IV *Antitrust Law,* ¶911a and b at 60–62.

607. The evidence does not show an undue reduction in the number of sellers in the organic pigment market. The FTC industry survey in this case involved some 100 firms, and more than 30 firms reported organic pigment sales data to the FTC for the years 1977–79. (Glassman 8707–08). *See* F. 584–86, *supra.*

VII. CERTAIN FACTORS OTHER THAN MARKET SHARES WHICH BEAR ON THE EFFECTS OF THE ACQUISITION

A. *The Direct Competition Between The Merging Firms Eliminated By The Challenged Acquisition Is De Minimis*

608. BWC and CPD were competitors in the sale of organic

pigments in the United States prior to the acquisition challenged herein. (CX 755P; 1907W–X; 3213D; 3214B; Muench 3825–26; Albers 6223–24). BWC identified CPD as a competitor in the sale of the following organic pigments: Pigment Violet 23 (carbazole violet), Pigment Red 123 (perylene), Pigment Green 10 (nickel azo), Pigment Red 5711 (lithol rubine), Pigment Yellow 14 and 17 (diarylide yellow), Pigment Blue 15 (phthalocyanine blue), Pigment Green 7 (phthalocyanine green) and Pigment Green 36 (phthalocyanine green). (CX 1710).

609. CPD included BWC as a competitor in its marketing plans. (CX 784R–S; 2036G; 2041H; 2047E, EE). BWC included CPD as a competitor in its marketing plans. (CX 202J; 212Y; 227I, Y). They were competitors in the sale of organic pigments to the printing ink, plastics, and paint industries. (CX 1833; 1836; 1838). A comparison between CPD's top 50 customers (RX 2722) and BWC's largest customers, ranked by end-use industry (CX 1708), reveals that [***]. **[154]**

610. Subsequent to the acquisition, CPD ceased production of several organic pigment products, including: perylenes (Malchick 3157), phthalocyanine crude (Malchick 3157; Kiesling 6149; *see* CX 663B–C), some phthalocyanine beta blue (P.B. 15:3) (Malchick 3159), and phthalocyanine alpha blues (P.B. 15:1, 15:2). (Malchick 3158). *See also* Long 5965–66.

611. Prior to the acquistion, BWC sold most of its organic pigments in dry form to the coatings industry, while CPD sold most of its organic pigments in flushed form to the ink manufacturing industry. *See* F. 308–10, 413, *supra*.

612. Eli M. Aschner, former marketing manager of the PIC Department of BWC, testified for respondent that BWC and CPD met "on an extremely limited basis, the exception rather than the rule." The reason is that "essentially we were existing in different worlds." (Tr. 5373). Mr. Aschner stated that he regularly reviewed salesmen's reports and that instances of mention of CPD in BWC's salesmen's reports were "really rare" because the product lines of BWC and CPD did not significantly overlap. (Tr. 5375–76). We were "really working in different businesses." (Tr. 5376). "Chemetron functioned in areas where we did not function." (Tr. 5377).

613. Richard L. Alsager, marketing research manager for the Pigments Division of BWC and formerly of CPD, testified for respondent that the vast majority of CPD's sales were in flushed colors to the paste ink industry, whereas BWC sold no flushed color and its specialty was sales to the coatings industry with a small amount of sales to the plastics industry. (Tr. 3608–10). RX 2722–2723

(revised 8/19/81) shows that, [***] (Tr. 3670). *See also* RX 4065D (Acquisition of CPD supplemented BWC's product line in the United States (May 23, 1978)); RX 6785G, II (Lists CPD's major competitors and BWC is not listed); CX 2041F (April 19, 1974); CX 2047K (CPD document in which BWC is not listed among CPD's major competitors (July 14, 1977)).

614. Dr. Erwin F. Hahn, former manager of BASF America, testified that in the area where BWC extended the greatest effort—auto coatings—BWC did not meet CPD, which emphasized sales to the printing ink industry, particularly of flushed pigments. BWC did not flush organic pigments and had a small penetration in the printing ink industry selling dry pigments (Tr. 4011, 4016). Dr. Josef F. Kohnle testified that BWC did not sell alkali blue and did not flush the two areas important to CPD, and that CPD did not produce specialty pigments imported by BWC. (Tr. 4418). **[155]**

615. Jerome E. Counihan, who, prior to his retirement in 1980, was the president of CPD and of the Pigments Division of BWC, stated that before the acquisition he never considered BWC a competitor of CPD. CPD sold largely flushed pigments for use in oil varnishes that go into sheet-fed web offset and letterpress fields, whereas BWC's organic pigments for ink were used in a publication gravure application. (Tr. 5633–36). He also stated that BWC produced no flushed pigments, whereas about 70% of CPD's organic pigment business was flushed. (Tr. 5634). CPD's primary end-use industry was the ink industry and less than 10% of CPD's phthalocyanines were sold in dry form. (Tr. 5635, 5637).

616. Paul Papillo, head of CIBA-GEIGY's United States pigment business, testifying in the case-in-chief, stated that he did not know of a situation where CPD, BWC and CIBA-GEIGY competed head to head in the marketplace. (Tr. 1872).

617. Heinz Geiss of American Hoechst, testifying in the case-in-chief, stated that in his ten years of pigment sales experience in the United States, he never saw BWC and CPD in direct competition for the same account. (Tr. 2161–62). Mr. Geiss also testified that American Hoechst rarely came into contact with CPD in the marketplace, and that [***] (Geiss 2161–62; Malchick 3346–47).

618. Sol Panush of Celanese, a customer of BWC, testifying in the case-in-chief, stated that from his point of view (automobile coating), BWC and CPD were not in competition prior to the acquisition. (Tr. 2327–28).

B. *BWC Was A Small and Insignificant Factor In The Organic Pigment Market*

619. Herbert McKenzie, former manager of the colored pigments

department of American Cyanamid, did not view BWC as an important competitor and did not base pricing decisions on his perceptions of BWC or BASF AG. (Tr. 6923).

620. American Hoechst felt that prior to the acquisition of CPD, BWC was weakly represented in the pigment field. (CX 3001E). Heinz Geiss testified that American Hoechst did not consider BWC to be a significant factor in the organic pigments industry in the United States. (Tr. 2157). He testified that BWC was competing only via **[156]**imports [***] (Tr. 2169, 10703, 10726). He also stated that [***] (Tr. 2159). An American Hoechst document of March 31, 1978, viewed BWC [***] (CX 3009L). *See also* CX 3010VV–YY [***].

621. Mr. Whittemore of Sun, testifying in the case-in-chief, stated that before the acquisition of CPD by BWC, Sun saw only sporadic activities on the part of BWC to sell products in the United States business on an import basis. Prior to 1974, BWC put on a "semi-major drive" to sell phthalocyanine in the United States but after shortages came, BWC withdrew and never came back in a serious way. (Whittemore 1947–48). Mr. Whittemore stated that he saw no major effort by BWC after 1973. (Tr. 1951). In addition, Sun has never taken any action or developed any pricing policy in the United States based on its perception of BASF AG in Europe. (Whittemore 1986). BWC was only a minor factor in the organic pigment business in the United States in 1977–1978. (Whittemore 1980).

622. Erhard E. Schober of Mobay (a subsidiary of Rhinechem) perceived BASF AG as attempting to establish itself in the United States organic pigments industry based on increased activities of BASF AG and BWC during the mid-to late 1970's. (Tr. 1663–64). However, Mr. Schober still perceived BASF AG as being in the lowest of three groups in the United States market prior to the CPD acquisition. (Tr. 1668). This statement is confirmed by a Rhinechem document, [***] (CX 3307C (1978)).

623. Mr. Papillo of CIBA-GEIBY viewed BWC as basically a supplier of specialty pigments, like CIBA-GEIGY. (Tr. 1826; CX 3508). He testified that CIBA-GEIGY's business was stagnating because of import problems and could not have expanded its import base profitably. (Tr. 1876–78).

624. Mr. Panush of Celanese Corporation testified that BWC [***] (Tr. 2316, 2327, 2370). He also testified that, before its acquisition of CPD, BWC ranked in [***] (Tr. 2307–08). According to Mr. Panush, BWC also [***] **[157]**[***] (Tr. 2325).

C. *BASF AG, Because Of Its Worldwide Position, Was Watched By The Leading Firms In the United States Organic Pigment Industry As A Possible Source of Competition Apart From BWC's Presently Insignificant Market Position*

625. There was a perception during the mid-1970's that BASF AG was attempting to exand its presence in the United States colorants market. (Papillo 1836–47; Schober 1662–64; 1668; Counihan 5766; Panush 2256–59; Kohnle dep. CX 5090BB; CX 2047E; 3409A; 3418Z).

626. BASF's acquisition of GAF's Rensselaer facility in March 1978 was viewed by some as the base for BASF's potential expansion in organic pigments as well as dyestuffs. (CX 3215F, J, N; 3508P; 3821L). Some perceived that BASF would probably build an organic pigments facility in the United States. (CX 3106K; 3223P; 3603I, AA; 3801L). In January 1979, Kohnle of BASF told some industry members that [***] (CX 3408; 3409A).

627. The leading competitors in the United States organic pigment market monitored BASF's activities both in Europe and in the United States. (CX 3508; 3509C; 3510E; 3511–14; 3603I, M, AA; Lipton 1607–09; Schober 1659–60; Whittemore 1999; 1946–47; 1948; Smith 1473–74).

628. The domestic competitors recognized BASF's strong position in phthalocyanines worldwide since its 1978 expansion of phthalocyanine plants in Germany and BASF's "potential to affect the domestic [phthalocyanine] market significantly." (CX 3401; 3415F 6014). Subsequent to BASF's European expansion, [***] (CX 3415G; [***] later withdrew from phthalocyanine business. [***] decided against exanding its domestic phthalocyanine production capacity in part because of BASF's worldwide position in phthalocyanines. (Lipton 1609–11).

629. BASF's introduction of the Paliotol line of pigments (particularly the isoindolines) also affected CIBA-GEIGY, which found [***] **[158]**[***] (Papillo 1836–38). Also Sun Chemical (CX 3113A–C) and American Hoechst (CX 3031I) [***].

630. Hercules cited BASF's technological capability and financial commitment to research and development as a factor in its decision to withdraw from the organic pigment business in the United States. (CX 3612W; Nicoll 10688–90).

D. *Entry Barriers Into The Organic Pigment Market Are Substantial But Entry Is Unimpeded*

631. There are no absolute or high entry barriers in terms of essential raw materials or production processes in the organic pigment market in the United States. (Glassman 8730–33). Phthalo-

cyanine crude, once in short supply, has been available at low costs for some years from Japanese importers. (Glassman 8733). *See* F. 238, *supra.* However, there are certain processes and skills which are difficult to master and are important to particular end-use industries, such as flushed colors for inks and high-technology pigment products for automotive coatings. (Whittemore 1799–1800).

632. Patents no longer play an important role in the organic pigment market. Most patents involving the more important new organic compounds have expired. Many successful firms operate without patents. (Glassman 8730–31).

633. The capital requirements for *de novo* entry into the organic pigment industry are substantial. An organic pigment manufacturing facility costs between $12 to $20 million. (Whittemore 1913–16; Canon 12544–46). Also planning, construction and outfitting of a pigment plant takes a few years. Sun Chemical's new organic pigment plant cost about $12 million, and was the first stage of a $30 million program announced in 1978. (Glassman 8735). Others, including Magruder have been able to expand at much lower cost. For example, Mr. Weissglass stated that a line of heavy duty mixers and mill can be added at about $500,000. (Weissglass 2541–42; Glassman 8735–40).

634. Generally speaking, the production of the so-called high-technology pigments involves more complex technology than the production of commodity pigments. Some high-performance pigments, such as phthalocyanines, are not regarded as high-technology pigments. (Papillo 1778–79). Most of the recent entrants offer technical excellence without producing high-technology pigments. *See* CX 3946G; F. 699. **[159]**

635. Government regulations in the fields of environment and workplace safety established during the recent years have increased the capital costs of entry into the organic pigment industry, as in many other industries. However, these regulatory costs are manageable and have not been a significant obstacle to entry or continued growth by new firms in the organic pigment industry. (Weissglass 2524). *See* F. 233, 235, 298–K, *supra;* F. 700, 702, *infra.*

636. Research and development is not a significant barrier to entry or continued growth in the organic pigment industry. There have not been any important breakthroughs in terms of new compound synthesis for some time, and many important patents have expired. As a result, only a small number of industry giants engage in R&D in the conventional sense, the majority devoting their research resources to applications research, development of matching pigment products for counteroffering, product modifica-

tion, and to technical service of their customers. *See* F. 255–66, 324, 550, 559, 561, 564, 567, *supra;* F. 699, *infra.*

637. Although a broad product line and capability to serve the needs of more than one user-industry is an obvious advantage, the product scope has not been a significant barrier into the organic pigment industry. On the contrary, most of the successful recent entrants have been those who established positions by specializing initially in one or two user-industries with relatively limited product lines and expanded their product scope as their businesses grew. *See* F. 280, 557, 562, 566, *supra;* F. 702, *infra* .

638. A well-trained marketing force backed by a competent technical service staff is essential in the sale of organic pigments, which is intensely user-oriented. It is difficult and time-consuming to develop this essential capability internally, but it is possible to recruit or hire away qualified personnel. The evidence shows that a seasoned marketing force backed by an able technical service staff can make the difference between growth and decline, or success and failure. *See* F. 276–78, *supra;* F. 702, *infra.*

639. Product differentiation is not a significant market factor in the organic pigment industry, which sells industrial products on the basis of cost and technical performance characteristics, and not brand names or advertising. (Glassman 8736).

640. The product approval system is a significant entry barrier in the automotive coatings segment of the market and can delay entry for a few years in that segment. *See* F. 279, *supra.*

641. Dr. Adelman, respondent's expert witness, expressed an opinion, based on RX 8018 (purporting to measure the relationship **[160]**between rate of return and market share), that there is no significant economies of scale in the organic pigment industry. (Tr. 10198). The record does not contain sufficient and reliable evidence on this issue. However, there is evidence tending to show that while some large producers have experienced low or negative profitability, most small producers have been profitable. *See* F. 686–704, *infra.*

642. During the last 20 years, American Hoechst has been the only major *de novo* entrant to become an upper-tier firm in the organic pigment market. However, there has been a number of entries at a smaller scale during the 1960's, which are now well entrenched, growing and profitable. *See* Counihan 3536–54. F. 637, *supra.* It is safe to conclude that these new entrants not only checked further concentration but also will begin to bring about a perceptible decline in the level of concentration in the market in spite of a number of reported mergers in the past few years. *See* F. 604, *supra.*

643. From the foregoing, it is found that entry barriers to the

organic pigment market are substantial but entry remains unimpeded.

E. *There Is Significant Product Heterogeneity In the Organic Pigment Market*

644. Because the organic product industry is highly user-oriented and serves a number of different user-industries, products are offered in many different forms, designed to meet diverse product requirements of customers. *See* F. 63–97, *supra.*

645. Apart from product specifications and standards, applications technology and technical assistance are important parts of the product-service package that users demand in the organic pigment industry. *See* F. 276–79, *supra.*

646. It is generally accepted that product heterogeneity can diminish the anticompetitive effects likely to flow from seller concentration and is therefore a relevant factor in evaluating the effects of a given merger. *See* IV *Antitrust Law,* ¶ 919 at 91–93.

F. *The Organic Pigment Market As A Whole Is Characterized By A Low Level Of Buyer Concentration*

647. The general level of buyer concentration in the organic pigment market is low, except in the automotive coatings end-use **[161]**segment. The number of automotive coatings producers is small. (Glassman 9809–11; Kamerschen 10983).

648. Many users of organic pigments are technologically sophisticated, large firms which have substantial leverage as large volume buyers. Such firms include Celanese Corporation and Ford in automotive coatings, DuPont, PPG and Sherwin-Williams in architectural coatings, and Flint, Sun, and Sinclair and Valentine in printing inks. (Glassman 8764–65).

649. It is generally accepted that the presence of large buyers, fewness of orders and the ability of sellers to conceal price concessions for a time tend to drive prices down toward competitive levels even in a market where seller concentration is high. *See* IV *Antitrust Law,* ¶ 918 at 89–91.

G. *Competition From Imported Organic Pigments Can Be Expected To Have A Moderating Influence Upon The Effects Of Seller Concentration*

650. Imports of organic pigments have undergone a dramatic increase during the recent years. And the ratio of imports to domestic consumption is substantial (about 11.5% in 1977), although there has been some year-to-year fluctuations. *See* F. 298–M, *supra.*

651. It is generally accepted that imported products increase competition and tend to have a moderating influence on prices.

Although four European companies control some three-fourths of all imports, the magnitude of imports by these firms, either individually or collectively, remain unpredictable from year to year, and imports can be reasonably expected to exert a beneficial influence on price competition. *See* F. 298–N–T, *supra.*

652. The inadequate productive or marketing resources of one of the merging firms is a mitigating factor in evaluating the competitive effect of a given merger and may be raised as a defense to show that they tend to lessen the competitive significance ordinarily inferred from their market shares. *Brown Shoe Co. v. United States,* 370 U.S. 294, 346 (1962); *General Dynamics Co. v. United States,* 415 U.S. 486, 501–02 (1974).

653. It has been suggested that such mitigating factors bearing on the merging firm's competitive vitality may save a merger "only **[162]**where they establish that market shares reflecting 'true' competitive potential would fall below the threshold for presumptive illegality." IV *Antitrust Law,* ¶ 939 at 131, ¶ 934a–b at 132–35.

H. *Because Of Chemetron/ALI's Disinvestment Policy Permitting Continued Deterioration Of CPD's Productive Facilities During The 1970s, CPD's Market Shares Tend To Overstate Its Competitive Potential In The Organic Pigment Market*

654. Chemetron and ALI, the successive owners of CPD during the 1970s, lacked a clear commitment to the organic pigment industry and permitted CPD's productive facilities to deteriorate steadily over the years by failing to provide capital necessary to adequately maintain and bring such facilities reasonably up to date. *See* F. 339–78, *supra.*

655. Dr. Adelman, respondent's expert witness, concluded, based on his "disinvestment" analysis and other record evidence, that:

> Well, they were an ineffective decreasing competitor and their current market shares was probably a biased predictor, an over predictor of their subsequent market shares. That would be the estimate I make on the basis on the figures that stop in 1978, and it seems to me that the developments other than in the years following do bear out that kind of prediction, because the market share of Chemetron, if you make allowance for the addition of the BWC share, those continue to decrease just as these numbers would predict it would decrease. (Tr. 10,190).

656. Regarding CPD's competitive vitality, Mr. Panush of Celanese Corporation stated that it was his impression that CPD was [***] (Panush 2318). And Mr. Whittemore of Sun Chemical testified that CPD was going downhill prior to the acquisition, in the period starting in the late 1960's and continuing into the 1970's and that the "Huntington plant was increasingly in bad shape from the standpoint of maintenance, from the standpoint of industrial rela-

tions, and that it wasn't being supported with additional investment." (Whittemore 1994). **[163]**

I. *There Is Evidence Which Suggests That BASF/BWC's Marketing And Technical Service Capabilities In The United States Were Ineffectual*

657. Sol Panush, Manager of Color for Plastics and Specialties Division of Celanese Corporation (a coatings producer and a customer of BWC), who has over 30 years of experience in purchasing pigments (Tr. 2196–99, 2252), testified in the case-in-chief that supplier integrity is an essential element in a buyer's decision to purchase. (Panush 2209). It is not easy for a manufacturer to establish supplier integrity and it takes a long time. (Panush 2211).

658. Six characteristics of integrity are: (1) ability to respond quickly and accurately, (2) ability to communicate accurately, (3) ability to produce what is promised, (4) ability to maintain a product standard for a long time, (5) believeability, and (6) ease of relationship. According to Mr. Panush, BWC failed in these areas: ease of relationship, ability to respond quickly and proper communications. (Panush 2324–25).

659. According to Mr. Panush, [***] (Tr. 2314–15). Mr. Panush rated BWC's technical service [***] (Panush 2312, 2370–71). [***] (Panush 2313).

660. [***] (Panush 2308).

661. Dr. Erwin F. Hahn of BASF testified that there were instances when BWC did not have enough pigments on hand, requiring that shipments be rushed in by plane and that pigment shipments were sometimes delayed by dock strikes. (Hahn 3974–75).

662. Dr. Josef F. Kohnle, Group Vice-President of BWC, discussing the period 1975–1978, stated that BWC was not considered a **[164]** reliable supplier by United States customers. (Kohnle 4402, 4404). He testified that BWC's difficulties in selling imported pigments would have been eased by higher prices in the United States, but the problem [***] (Kohnle 4500–01). He also mentioned the difference between the vehicle systems used in the United States and Europe. (Kohnle 4409). *Also see* F. 189–98, *supra.*

663. Dr. Albers of BASF testified that [***] (Albers 6188). And Dr. Erich Stoeckl, BASF AG's head of pigment production, testified that BASF AG's pigment production in Ludwigshafen [***] *Also see* F. 425, *supra.*

J. *BASF's Worldwide Market Position And Its Financial And Technological Resources Relied On By Complaint Counsel As Indicating That Competitive Significance Of BWC Is Understated By Past Market Shares*

664. BASF is a leading producer and marketer of organic pigments worldwide and has abundant financial resources. F. 2–6, 386–89, *supra.*

665. BASF also has unsurpassed technological resources. It conducts well-financed R&D programs both basic and product development. Its recent product developments are among the most significant advances in pigment technology. F. 397–403, *supra.*

666. Inspite of its worldwide market position, abundant financial resources and technological capabilities, BASF/BWC's market share in the United States organic pigment market has remained insignificant for many years, demonstrating that those desirable attributes of BASF have in fact had little effect upon BWC's pre-acquisition market shares.

667. The record is devoid of any clear evidence of recent new products or processes, or any clear evidence of domestic expansion by BASF/BWC that is not yet reflected in BWC's pre-acquisition market shares. *See* IV *Antiturst Law,*¶ 937 at 142–43. **[165]**

VIII. THE EVIDENCE RELATING TO MARKET PERFORMANCE SHOWS THAT THE ORGANIC PIGMENT INDUSTRY IS COMPETITIVE

A. *The Organic Pigment Market Is Characterized By Vigorous Price Competition*

668. The record shows that there is no significant price leadership in the organic pigment market in this country, price-cutting and off-list sales are common occurrences, and smaller firms are particularly effective price competitors.

669. Harold Whittemore, senior vice-president of Sun, testifying in the case-in-chief, stated that prices in the organic pigment business have not kept up with inflation. [***] it was the small competitors, such as Magruder, Apollo, Pope and Allegheny, that were particularly effective price competitors. (Tr. 1975–76).

670. Allan Weissglass of Magruder, testifying in the case-in-chief, stated that considerable price-cutting occurs in the industry. (Weissglass 2525). Herbert McKenzie, President of the Hilton-Davis Division of Sterling Drug, characterized the industry as "price competitive." (McKenzie 6959). Dr. Canon, former Vice-President of Harshaw, testified that the phthalocyanine segment has been chaotic pricewise. (Canon 12,520).

671. Eli Aschner, former marketing manager of BWC-PIC, testified that the organic pigment business was a very price-competitive business, that selling below list prices was "very common," that there was a substantial amount of off-list selling in the market, and that, as documented in RX 1338A, "list prices are rarely what customers pay for any toner." (Tr. 5334-35, 5338, 5407–11). He also testified during his deposition that BWC sold below list-prices to meet competition. (CX 5084CC). Also, Dr. Kohnle of BWC testified that there are many sales off the list and that discounts varied from one product to another. (Kohnle 4501–03). *Also see* Counihan 5643, 5691; Albers 6190.

672. The Sun 1977–1982 Long Range Plan, in assessing Sun's major competitors, noted that many firms competed on the basis of pricing, for example: [***] **[166]**[***] (CX 3107).

673. An American Hoechst Semi-Annual Report for 1976 commented that there were pricing battles with respect to different pigments [***] (RX 6003J). An American Hoechst document assessing the diarylide yellow market notes that [***] (CX 3009M) and observed that [***] (CX 3009N).

674. An American Cyanamid study prepared for American Hoechst in December 1979 commented that green shade phthalocyanine, [***] (CX 3023Q).

675. CPD's 1978–1982 Long Range Plan (CX 2047) noted that the ink industry, CPD's primary end-use market, is highly price competitive, [***] (CX 2047E–F).

676. In a June 5, 1978 letter to Dr. Hahn of BASF AG, Mr. Aschner of BWC reported that the BWC list price for phthalocyanine Green 7 was [***], and that competitors such as DuPont were selling the same pigment for [***] (CX 763). In a similar vein, BWC's September 1978 Monthly Report (CX 258) reported [***] in the coatings and plastics segments. (CX 258C). BWC's January 1979 Monthly Report anticipated that [***] (CX 278C).

677. Mr. Glassman, respondent's expert witness, opined that the diversity of prices and diversity of price changes, as well as the inability of organic pigment sellers to maintain list prices, suggested strongly that no tacit arrangement to restrict competition and to limit output existed. (Glassman 8767–68). Mr. Glassman also testified that the absence of price leadership (Tr. 8777–79) and the absence of collusion among pigment manufacturers (Tr. 8763) supported **[167]**his opinion regarding the highly competitive nature of the industry. *Also see* Adelman 10,193.

B. *There Is Evidence Of Overcapacity In The Organic Pigment Industry Which Tends To Spur Price Competition And Depress Profitability*

678. There is a clear perception among industry witnesses that there is overcapacity in the organic pigment industry in the sense that production capacity is significantly larger than demand for the products.

679. Michael P. Parker, former marketing manager of pigments of ICI, Limited and now its Business Manager of Dyestuffs and Intermediates, Organics Division, testified that for the years 1976–1977 and 1980, a period when he had first-hand knowledge of the organic pigment industry in the United States, there was "fairly significant overcapacity" in the industry. (Parker 4955). Sol Panush of Celanese, testifying in the case-in-chief, stated that there was overcapacity in the organic pigments industry in the late 1970's, particularly in phthalocyanines. (Panush 2358). And Allan Weissglass, President of Magruder Color, testifying in the case-in-chief, stated that he believed there has been excess capacity in the organic pigment industry from the late 1970's to date. (Weissglass 2527).

680. Heinz Geiss of American Hoechst, testifying in the case-in-chief, stated that at least since 1975, overcapacity in the organic pigments industry in the United States has led to intense price competition [***] (Geiss 2134). *Also see* Kohnle 4465; Albers 6189.

681. Dr. Malchick of BWC testified that overcapacity has existed at least "since the Sun Plant at Muskegon has been on stream, but I think that also adds with the other expansions that the smaller companies have come on with over a period of five to ten years." (Tr. 3324).

682. Jerome Counihan, former president of CPD, described a series of events in the last decade and a half which contributed to the increase in industry capacity, including the 1967 announcement by DuPont of its plan to build a multi-million dollar plant to produce **[168]**quinacridone pigments (Tr. 5539), the dramatic increase in the importation of low cost phthalocyanine crude from Japan, and the willingness of the importers to teach purchasers the technology needed to finish the crude into pigment form. This development allowed four new companies, Apollo, Pope, Sun and Magruder, to enter into the sale of phthalocyanine pigments. (Tr. 5539–40). Mr. Counihan also stated that DuPont announced a doubling of its phthalocyanine blue production in 1970, that American Cyanamid expanded its azo pigment plant in 1975 and that American Hoechst doubled the capacity of its azo pigment plant in 1976. (Counihan 5542–43).

683. Complaint counsel's exhibits in evidence tend to support the testimony that the organic pigment industry has overcapacity. A 1974 [***] evaluation of the phthalocyanine industry warned of the problem of overcapacity in the future. (CX 3603N, AA). In a 1975 operating report, [***] recognized that the organic pigment industry has always had sufficient capacity to meet demand. In certain areas where a minimum of technology is required, over-supply has deteriorated the price structure to the point where some manufacturers withdrew. (CX 186F). In December 1978, an [***] study noted that there is general overcapacity in the industry. (CX 3007G). [***] recognized in 1978 that [***] (RX 6015K). *See also* CX 3846Y, WW.

C. *The Organic Pigment Industry Is Characterized By Subnormal Profitability*

684. It is a generally accepted theory of industrial organization economics that persistently high or supra-normal returns over time signifies market power and a likelihood that the market is not performing competitively, while persistently low or subnormal returns over time negates market power and a likelihood that the market is not performing competitively. *See* Glassman 8794–95; Kamerschen 11,630–33; II *Antitrust Law,* ¶ 508–509 at 331–33.

685. It is also recognized that accounting or "book" rates of return may not reflect true economic rates of return and that, for the purposes of assessing market power and industry performance, the former is less meaningful than the latter. However, proper measures of the latter are disputed and further theoretical and empirical research is believed to be necessary before rates of return can be **[169]**measured reliably and interpreted with certainty. *See* Kamerschen 11,020–31; II *Antitrust Law,* ¶ 512c at 336–37, ns. 4 and 5.

686. There was a clear perception among industry witnesses that the organic pigment industry has experienced low profitability, and high-level executives of several large firms in the market testified that their profitability was low or marginal and sometimes negative. Similar comments are also found in some marketing documents. Respondent's expert witnesses concluded, on the basis of the above evidence and an industry profitability study they prepared, that the rate of return of the industry was relatively low.

687. [***] testified in the case-in-chief that [***] had sizeable losses in each of the years from 1975 through 1978, and that his company considered alternatives, [***] (CX 3007; [***]). The participation of [***] And an employee of [***] in a trip report prepared in April 1978, found the organic pigment and dyes industry in the United States "characterized by a completely unsatisfactory reurn situation." (CX 3002B).

688. Paul Papillo, Vice President of CIBA-GEIGY Plastics and Additives Division, testified that specialty pigments (which are also high-technology pigments) are more profitable than what he described as "commodity" pigments. He classified phthalocyanines as commodity pigments. (Tr. 1778–79).

689. Herbert McKenzie, President of Hilton-Davis Division of Sterling Drug and former General Manager of the Color Department, Pigment Division, American Cyanamid, characterized the industry's profitability as mediocre. (McKenzie 6933). A 1977 [***] study of the printing ink industry found that [***] (RX 6526C).

690. [***] 1979 report prepared for [***] in connection with a possible purchase by the latter of its [***] business, stated that the business had "limited current profitability." (CX 3024E).

691. William O. Nicoll, former General Manager of the Coatings and Specialty Products Department of Hercules, called as a witness by [**170**]complaint counsel in rebuttal, testified that the pigment business, during the period 1975 through 1978, "was not as profitable as some of the other Hercules businesses." (Nicoll 10,685).

692. [***], testified that sales and manufacturing margins in phthalocyanines had declined since the early 1960's and that there was no prospect of suitable profits in the phthalocyanine business. [***] His testimony is supported by CX 3846(5)J, a report on phthalocyanine production prepared by an outside consulting agency.

693. Sol Panush of Celanese, a purchaser of organic pigments, testified in the case-in-chief that he regarded the organic pigment industry as "a low profitability industry." (Panush 2358).

694. [***] study of the organic pigment business completed in May 1978, concluded that [***] (CX 3308B).

695. Jeffrey M. Lipton, former director of DuPont's Colored Pigment Production Division, who testified in the case-in-chief, stated in a speech to the National Paint and Coatings Association in October 1979:

> I could describe our industry as one where companies are today earning relatively low returns on generally old, marginally maintained facilities - utilizing sometimes ancient technology and black art to make specialty chemicals that are too often treated like commodities and are sold into low growth markets. (For example, in the U.S., the coatings and ink industries, both growing very slowly overall, represent about 75% of the demand for pigment colors.) (CX 3218D).

696. Dr. Josef F. Kohnle, Group Vice-President of BWC, testified that the pigments industry is an industry with "low profitability or no profitability." (Kohnle 4462). Jerome Counihan, former President of CPD, stated that the organic pigments business is highly

competitive and that profits are "less than [are] desirable" [171]for any type of pigment company of any size. (Counihan 5560–61). *Also see* Malchick 3312–13; Aschner 5507.

697. Dr. Hans Albers, head of BASF America and member of BASF AG's Vorstand (Board of Directors) with responsibility for, among other operations, BASF's pigment production and sales, testified that BASF AG's organic pigment export business in the United States [***] (Albers 6189, 6191). *See* RX 15D–E; 26J–K, O, S, X; 27B, F; 28B–C, 2950KKKK–LLLL. *Also see* Hahn 3959–63.

698. Mr. Glassman, respondent's expert witness, expressed an opinion, based on an industry profitability study he conducted (RX 2131, revised August 19, 1981), that the organic pigment market had relatively low rates of return for the years 1973–1978, and that the rates were substantially lower than those for all manufacturing companies, for companies in "chemicals and allied products," or for companies in "industrial chemicals and synthetics." (Glassman 8943–54). While the Glassman profitability study was based on more data than is ordinarily available to students of industrial organization economics and thus provides information of value, its data base is ill-defined, incomplete and mixed and its probative value is limited. However, Mr. Glassman's view of low profitability is generally in accord with other testimonial and documentary evidence in the record.

D. *Smaller Firms Are Growing Rapidly And Generally More Profitable Than Larger Firms*

699. Mr. Geiss of American Hoeschst testified in the case-in-chief that small companies like Apollo, Pope, Magruder, Industrial Color, Roma Chemicals, and Max Marx, Uhlich seem to have grown faster than some of the bigger companies. (Geiss 2171–72). Among American Hoechst's competitors, Mr. Geiss named such large companies as DuPont and Sun as well as such smaller companies as Harmon, Hilton-Davis, Magruder, Harshaw, Industrial Color, Pope and Apollo. (Geiss 2160–61). He also testified that there is no need for vertical integration or a full product line for a company to be successful in the organic pigments industry and added that [***] (Geiss 2170–71). He further testified that smaller firms were among the first to duplicate and offer Hoechst's HR yellow-type pigments when the Hoechst patent expired in the mid-1970's and that they did so years earlier than either CPD or Sun Chemical. (Geiss 2080–85).

700. Both Dr. Hugh Smith and Mr. Whittemore of Sun, testifying in the case-in-chief, stated that the smaller firms such as Apollo, [172]Pope and Magruder were well able to cope with increasing regulatory pressures. (Smith 1537; Whittemore 1995).

701. Erhard Schober of Mobay testified in the case-in-chief that a broad product line is not necessary for success in the pigments industry and that Apollo and Pope are among the "major" producers of phthalocyanines in the United States. (Schober 1738–40).

702. Allan Weissglass, President of Magruder, testified that Magruder's production capacity and volume of sales has increased steadily from the mid-1960's to the present and that in the past three or four years, Magruder's dollar sales have increased almost [***] a year. The industry is not growing as fast as Magruder has, and Magruder's growth has thus come at the expense of other manufacturers' market share. (Weissglass 2520). Mr. Weissglass described Magruder as a successful competitor in the organic pigments industry and attributed his success to a good marketing team backed with the investment and people in production needed to do the job. (Weissglass 2523). Magruder does a particularly good job in matching competitors' products and has "innovated" better or improved colors especially in the flushed area. (Weissglass 2523–24). Magruder produces high quality pigments with a lean organization which has a minimal overhead. Environmental restrictions have not posed any great obstacles to Magruder's growth in recent years. (Weissglass 2524). Now that American Cyanamid has divested its phthalocyanine line, Magruder's product line of flushed pigments for the printing ink end-use is broader than either DuPont or American Cyanamid. (Weissglass 2526). In Mr. Weissglass' opinion, the smaller companies in the organic pigments industry have grown satisfactorily. (Weissglass 2527). Mr. Weissglass also considered Sun, Apollo, Pope and Magruder to be the best innovators in the flushed color area. (Weissglass 2530–31).

703. Jerome B. Giniger, Vice President of Marketing, Pope Chemical Company, testified that Pope was one of the smaller producers of organic pigments, "but growing rapidly." (Giniger 7207). As an indication of Pope's low overhead, more than [***] of its employees are actually engaged in production. (Giniger 7215). [***] (Giniger 7210). [***] *Id.* Since 1973, Pope has been expanding its business at a rapid rate and has bought a major piece of new equipment almost every year. (Giniger 7213). Mr. Giniger attributed Pope's success to the fact that "we run a very efficient plant and we spend a lot of **[173]**time in finding, hiring, training and motivating the right kind of people, and quality in service, responding to our customer's needs." (Giniger 7216). Mr. Giniger further testified that Pope, "as an indication of our conviction and optimism concerning this market, made a very concerted effort to acquire the American

Cyanamid pigment operation, which is a substantial operation." (Giniger 7214).

704. Mr. Counihan, former President of CPD, testified that during the 1970's Magruder has been the "fastest growing pigment company in the United States," and that both Apollo and Pope have expanded their sales volume appreciably and have taken increasing market shares in the flushed color industry. (Counihan 5555, 5560). He also testified that the greatest strength that smaller companies have is their low overhead, coupled with the fact that they are very flexible in meeting changing demands because of the fact that they are managed by only one or two people and can reach important decisions swiftly. (Counihan 5782–83).

705. Dr. Malchick of BWC testified that Apollo, Pope and Magruder are small independent companies which have grown relatively rapidly in the last five to ten years, not only in sales volume but in capability. (Malchick 3075–76). Accordingly to Dr. Malchick, Ridgway, a subsidiary of Sinclair and Valentine, had been less aggressive in the past but is currently undergoing an expansion and will probably be more aggressive in the future. (Malchick 3077).

706. An important factor contributing to the success of these relatively small producers in the flushed pigments arena has been the dramatically increased quantity of phthalocyanine crude imported from Japan. Since the Japanese importers needed customers for their crude, they taught smaller companies the techniques needed to finish the crude into a saleable pigment. According to Mr. Counihan, since the price of imported crude is lower than the cost of producing similar crude domestically, the small companies are able to compete successfully, and the importers have a ready market for their crude. Mr. Counihan also testified that both BASF AG in Germany and BWC in the United States now purchase phthalocyanine crude from Japan. (Counihan 5541).

707. When BWC's South Kearny pilot pigment facility was closed, BWC learned that [***] were all willing to produce phthalocyanine presscake for sale by BWC at a cost which, it was thought, would allow BWC to make a small profit on resales, and [***] was actively seeking this business because it had recently tripled its plant size. (CX 630K–N). **[174]**

IX. THE EVIDENCE RELATING TO FACTORS OTHER THAN MARKET SHARES AND CONCENTRATION IS SUFFICIENT TO OVERCOME THE PRESUMPTION OF ILLEGALITY IN THIS CASE

708. The finding of presumptive illegality with respect to the

challenged acquisition was based on a low (10%) threshold. There is some authority which would raise the threshold level to 13–17% of the market where one of the parties has no more than 2% of an unconcentrated market. F. 580, *supra.* The organic pigment market is concentrated, albeit moderately. F. 584–90, *supra.* In these circumstances, the presumption of illegality of this merger was a relatively weak one. *Cf.,* IV *Antitrust Law,* ¶ 910a at 54 (the authors characterize the 10% aggregate share rule as "marginal"), ¶ 922 at 97 (the authors characterize a 10% aggregate share rule as "tenuous").

709. The record does not contain clear quantitative evidence to establish that the market shares reflecting "true" competitive potential of the merging firms would fall below the threshold level for presumptive illegality in this case. *Cf., United States v. Consolidated Foods Corp.,* 455 F.Supp. 108, 136 (E.D. Pa. 1978) (the court allowed a merger of 7%- and 3%- firms because of evidence of "steady and precipitous rate of decline" in sales of one of the merging firms). *See* IV *Antitrust Law,* ¶ 934 at 132–35.

710. It is found that the nature and quantum of the record evidence relating to market factors other than seller concentration (F. 608–53, *supra*), to factors affecting the significance of market shares (F. 654–67, *supra*), and to industry performance (F. 668–707, *supra*), collectively and cumulatively, are sufficient to overcome the adverse presumption based on the market share evidence. *Cf., United States v. General Dynamics Corp.,* 415 U.S. 486, 501–02 (1974).

X. THE POTENTIAL COMPETITION ASPECT OF THE CHALLENGED ACQUISITION

A. *BASF/BWC Was A Potential Entrant Into The United States Organic Pigment Market*

(1) *BASF/BWC Possessed Adequate Financial And Technical Resources To Enter The Organic Pigment Market*

711. The evidence is clear that BASF/BWC possessed adequate financial resources and capabilities to enter the organic pigment market in the United States. *See* F. 4, 387–403, 454–61, *supra.* **[175]**

712. The evidence is clear that, although there are significant differences in some pigment products and pigment systems between Europe and the United States, BASF/BWC possessed adequate technological resources and capabilities to expand internally its participation in the United States organic pigment market. *See* F. 711, *supra.*

713. The evidence is clear that, although BWC's existing market-

ing staff suffered from some deficiencies with respect to some user segments in the organic pigment market, BASF/BWC had sufficient resources and capabilities to remedy the situation. *See* F. 411–18, 659–63, *supra.*

(2) *BASF/BWC Was Determined To Become A Substantial Factor In The United States Organic Pigment Market One Way Or Another*

714. The evidence is clear that BASF/BWC was determined to become a substantial factor in the United States organic pigment market, commensurate with its position in the world market in colorants. *See* F. 448–51, *supra.*

715. BASF/BWC has over the years attempted to expand its participation in the United States organic pigment market through construction of domestic production facilities and/or acquisition of an established producer-marketer of organic pigments. *See* F. 466–500, *supra.*

716. At and about the time of the acquisition challenged herein, BASF was leaning toward an acquisition of an established domestic organic pigment producer because of a perceived economic unattractiveness of *de novo* expansion in the United States. *See* F. 466–68, 476–77, 486–88, *supra.*

(3) *BASF/BWC Had A Unique Incentive For Domestic Production Of Organic Pigments Because Of A Perceived Low Profitability Of Its Organic Pigment Import Business*

717. BASF's management had a perception that its organic pigment import business in the United States yielded unsatisfactory or low profits. **[176]**

718. Dr. Hahn, former general manager of BASF America and now director of BASF AG's Dyestuffs and Pigment Research Laboratory, testified that the Colors and Auxiliaries Division of BWC as [***] when he was put in charge of its operations in 1970. (Hahn 3955–56, 3959). RX 556, the 1974 Five-Year Plan of the Colors and Auxiliaries Division (which includes CPI) generally reflects the [***] (Hahn 3996). Dr. Hahn also testified that if BWC did not make the transition from imports to domestic production, it would stay at best a marginal factor in the industry. (Hahn 4009).

719. [***] is a BASF/BWC term which signifies net revenue (net sales less direct overhead charges) less cost of production, costed interest on inventories, costed interest on receivables, foreign exchange rate cost and selling expense. It approximates "gross profit." Thus, [***] does not include all of the overhead expenses. *See* Albers 6317; Tschirch 5210.

720. Dr. Albers, a member of BASF AG's Board, testified that [***] (Albers 6255–56).

721. Mr. Muench testified during his deposition that when he became Sparte CP director on January 1, 1978, he felt that the pigment export business to the United States was [***] (Muench 3793–96).

722. Dr. Kohnle, who succeeded Dr. Hahn at BWC, testified that BWC was [***] when he arrived in the United States from Germany in 1976. He stated that the pigment business [***] (Kohnle 4396–98). He testified that the Colors and Auxiliaries Division, which included organic pigments, [***] (Kohnle 4400–01). He testified that he believed imports of organic pigments [***] (Kohnle 4401, 4404). *See* CX 5091H–J. *See also* [***] CX 152A–B, E–F; 155L; 162Q–S, V, Y, FF–HH; 163H; 164A, F–G; 184P; 187UU–VV; 220F; 280A; 283A; 291GG.

723 The testimony and documents of BWC's foreign competitors tend to show that it was difficult to compete in the organic pigments business via imports in the period preceding the acquisition. **[177]** Michael Parker of ICI testified that, "I think it [profitability] varies year to year, but a fairly reasonable comment would be around the break-even level, measured in conventional terms." (Parker 4948–49).

724. [***] (Geiss 2131–32, 10,694, 10,703). He agreed that among the factors contributing to [***] (CX 3007B, D; Geiss 10,712).

725. The evidence shows that [***] specialty pigments (patented products or other high-technology pigments not made by domestic producers in the United States) were generally [***] import sales of other organic pigments. *See* RX 6015D; Geiss 10,700–11.

726. Mr. Papillo, a vice president of CIBA-GEIGY, testified in the case-in-chief that CIBA-GEIGY was faced with the choice of remaining in the business in the United States on an import basis and continuing to operate at a loss in the hope that the exchange rate would turn around or building a "greenfields" (*de novo*) plant in the United States in order to improve its profitability. CIBA-GEIGY rejected both alternatives. (Papillo 1875–80). CIBA-GEIGY subsequently acquired the organic pigment business of Hercules. *See also* CX 3001D [***].

727. The perceived or real unprofitability of BASF/BWC's import business gave BASF a strong, added incentive to produce organic pigments in the United States. *Also see* F. 432–47, 697, *supra*.

B. *The Elimination Of Potential Competition By BASF/BWC's CPD Acquisition Was De Minimis*

(1) *The Need To Preserve Potential Competition In the Organic Pigment Market Is Not As Important As It Would Be In A Highly Concentrated Industry.*

728. There is considerable support for the argument that the preservation of potential competition becomes important only in those [178]markets where the seller concentration is high. *See United States v. Marine Bancorporation,* 418 U.S. 602, 630–631 (1974); Turner, "Conglomerate Mergers and Section 7 of the Clayton Act," 78 Harv. L. Rev. 1313, 1386 (1965).

729. The organic pigment market is competitively structured. *See* F. 581, *supra.* The evidence relating to market performance indicates that the organic pigment market is competitive. *See* F. 668–707, *supra.*

(2) *There Were Other Potential Entrants/Expanders In The Organic Pigment Market*

730. Sandoz, Dainichiseika, Dainippon, and Toyo all large foreign manufacturers of organic pigments, attempted to enter the United States market either by an acquisition or a joint venture. (Sweeney 7375–76; McKenzie 6933–35). *Also see* Stipulation Between Counsel Concerning Reports of Companies, dated February 22, 1982.

731. There are a number of other foreign and domestic organic pigment manufacturers which possess resources and capabilities necessary to enter or expand in the organic pigment market. Such firms include: ICI, Gulf Oil Corp. (which owns Harshaw Chemical, an organic pigment producer); United Technologies Corp. (which owns Inmont, a producer of organic pigments) (CX 3946); and Montedison, a large French chemical firm. (Whittemore 1990).

C. *BASF/BWC's Acquisition Of CPD Was A Toehold Acquisition And May Be Procompetitive*

732. BASF/BWC's acquisition of CPD, which had about 10% or less of the organic pigment market, was a toehold acquisition. *See Budd Co.,* 86 F.T.C. 518, 580–81 (1975); II Areeda and Turner, *Antitrust Law,* ¶ 536f at 430–31.

733. There is some evidence which suggests that the challenged acquisition would have procompetitive and synergistic effects by combining a small factor with marketing difficulties and a well-established firm suffering from chronic disinvestment. *See* F. 380–85, *supra.* **[179]**

Discussion

A. *Introduction*

This case involves the 1979 acquisition of Chemetron Pigments Division (CPD), the fourth-ranking firm in the organic pigment market with a 1978 market share of [***], by BASF Wyandotte Corporation (BWC), an importer-reseller of BASF AG pigments and the 16th-ranking firm with a 1978 share of [***] thereby making BWC the third-ranking firm with a combined share of about 10.6%.

BWC's CPD acquisition is notable in two respects. *First,* it is a horizontal acquisition involving a major firm in a concentrated industry. *Second,* this acquisition, together with the 1979 acquisition by CIBA-GEIGY Corporation of the pigment business of Hercules Corporation, marks the transformation of the four European chemical industry giants from importers-resellers of European-made specialty pigments into producing members of the United States organic pigment industry.

The BWC-CPD merger is a presumptive violation of Section 7 inasmuch as it resulted in an aggregate market share of over 10% in a concentrated market. However, the record evidence relating to the various non-market share factors pertaining to this merger and the competition in the organic pigment industry convincingly demonstrates that the market structure evidence did not accurately depict the economic characteristics of the industry and that the industry is competitive. In my view, respondent has met the burden of overcoming the presumption of illegality. It is also my view that even if the submarket complaint counsel advance (phthalocyanine pigments) were accepted, raising the aggregate share to 15.5%, the ultimate outcome of this case should remain the same.

A brief discussion of the main issues in this case follows.

B. *The Product And Geographic Markets*

Although respondent represented to the Federal Trade Commission during the pre-complaint investigation that the effects of this merger should be evaluated in terms of an organic pigment market (F. 199), respondent vigorously contested the product market issue at trial and suggested that colorants, embracing organic and inorganic pigments and dyes, constituted the only appropriate market for the purpose of evaluating the effects of this merger. Complaint counsel, on the other hand, contended that organic pigments constituted a valid Section 7 market and that phthalocyanine pigments, as a group, constituted an appropriate submarket. **[180]**

The evidence suggests that "all colorants" *might* be a valid product market in a case where both the merging firms sold organic and inorganic pigments and dyes in competition with each other. In this case, however, CPD's only business was organic pigments. And the evidence is clear that organic pigments as a group constitute an appropriate product market, in terms of industry and public recognition of the market as a separate economic entity, the products' peculiar characteristics and uses, unique production facilities and distinct prices. (F. 201–21). *Brown Shoe Co. v. United States,* 370 U.S. at 325.

Although no single organic pigment can be a complete substitute for another organic pigment and, understandably, the price sensitivity evidence is mixed, there can be no serious dispute about the fact that the organic pigments industry is universally recognized as a distinct and economically significant entity and that the physical and functional characteristics of organic pigments and their uses are such as to constitute organic pigments as a single product market and to distinguish them from inorganic pigments and dyes.

The interpigment competition disclosed in this record, while arguably indicative of greater use of computer-programmed color-matching across the organic/inorganic division in some user-industry segments in the future, falls far short of obliterating the clear separation of organic pigments from inorganic pigments established by the evidence. (F. 144–64).

With respect to phthalocyanine pigments, a submarket advanced by complaint counsel, the evidence is insufficient to establish them as a Section 7 submarket. Apart from the fact that phthalocyanines are important and versatile pigments, the recognition of this subgroup of organic pigments as a separate economic entity is woefully lacking in this record. References to "phthalocyanine market" found in some marketing documents do not make phthalocyanines a product market in this case in light of other salient evidence on the issue. Fatal to complaint counsel's position is the clear evidence of a remarkable degree of interchangeability of production and distribution facilities across all organic pigments, including phthalocyanines. (F. 49–62, 98–101, 220, 276–79). *See Budd Company,* 86 F.T.C. 518, 572 (1975). In these circumstances, "phthalocyanine submarket" represents an unwarranted fragmentation of the product market and should be rejected.

Finally, the so-called disputed pigments (F. 119–40) can reasonably be separated from the organic pigments here, in terms of trade usage, their production and distribution, prices and users. In any event, their inclusion in the organic pigment market will not significantly alter the market share analyses set forth in this Initial Decision. **[181]**

The parties agree that the United States, Puerto Rico and the Virgin Islands constitute an appropriate geographic market in which to assess the effects of the BWC-CPD merger. (F. 222).

C. *The Challenged Acquisition Is A Presumptive Violation of Section 7*

The acquisition challenged in this case involves absorption by BWC of CPD, a competitor, in the organic pigment market. The intense congressional concern about anticompetitive mergers which led to the enactment of the amended Section 7 in 1950, as underscored by the Court in *Brown Shoe,*[8] mandates an early intervention against horizontal mergers producing substantial market share aggregations. In *Philadelphia National Bank,*[9] the Court, embracing the economic theory of oligopoly, determined that substantial market shares are proper bases for presuming the illegality of horizontal mergers. In *General Dynamics* and *Marine Bancorporation,*[10] the Court clarified the nature of other factors bearing on competitive significance of particular mergers which may be shown in order to rebut the presumption of illegality. Subsequent merger litigation delineated the substantiality of the threshold levels of aggregate shares for presumptive illegality.[11] In all, Section 7 jurisprudence of the last three decades has evolved a rule, now generally accepted, that horizontal mergers producing aggregate market shares of 10% or more in unconcentrated markets are presumptively illegal. This rule should govern the instant case.[12] **[182]**

The 1979 horizontal merger challenged in this case involves an aggregate 1978 share of 10.6% in the organic pigment market, which was moderately concentrated, and is a presumptive violation of Section 7.[13] (F. 584–90).

D. *The Organic Pigment Market Is Concentrated*

The 4– and 8–firm concentration ratios in the organic pigment market were 49.2% and 71.4% for 1977, 47.3% and 71.2% for 1978, and 49.6% and 76.4% for 1979, respectively. Thus, the organic

[8] *United States v. Brown Shoe Co.,* 370 U.S. 294, 311–23 (1962).

[9] *United States v. Philadelphia National Bank,* 374 U.S. 321, 362–67 (1963).

[10] *United States v. General Dynamics Corp.,* 415 U.S. 486, 494–504 (1974); *United States v. Marine Bancorporation,* 418 U.S. 602, 631–32 (1974).

[11] *E.g., United States v. Amax,* 402 F. Supp. 956, 958–959, 964–65, 972 (D. Conn. 1975).

[12] The rule of presumptive illegality with respect to horizontal mergers is based on the teachings of the theory of oligopoly, Section 7 case law and enforcement guidelines, and attempts to promote administrative or judicial efficiency, as well as consistency and predictability in merger law enforcement. *See* IV *Antitrust Law,* ¶ 908–15 at 26–83; Sullivan, *Antitrust,* at 616–21.

[13] The District Court which enjoined the Rhinechem-CPD merger found that the market share evidence showed the aquisition fell within the suspected category. The combined market share of the merging parties was not disclosed in the opinion, but it is believed to have been between 10 and 15%. *FTC v. Rhinechem Corp.,* 459 F. Supp. 785, 789 (N.D. Ill. 1978).

pigment industry was moderately concentrated at the time of the challenged acquisition. It fell within Kaysen and Turner's "Type I oligopoly," or somewhere between "loose" and "tight" oligopolies.[14] And, for 1977 and 1978, the 4–, 8– and 20–firm concentration ratios of the organic pigment industry were somewhat higher than the corresponding average concentration ratios for all manufacturing industries in the United States. (F. 590–91).

On the other hand, the organic pigment market had between 32–43 firms with market shares ranging from less than 1 to about 15% during the period 1977 through 1979. Areeda and Turner would characterize such a market as "competitively structured."[15]

Furthermore, BWC, one of the merging firms, was an insignificant factor in the market, with less than 2% of the market. For the purpose of a presumptive ban, Areeda and Turner would raise the threshold level for a merger involving BWC to about 14–17%.[16]

Finally, the evidence does not show a discernible trend toward greater concentration or an undue reduction in the number of sellers in the organic pigment market, attributable to mergers or otherwise. (F. 602–05). Therefore, the presumption of illegality of the [183] challenged acquisition based on a low threshold level of 10% is marginal or relatively weak.[17]

The rule of presumptive illegality of horizontal mergers discussed hereinabove assumes that other factors bearing on the competitive consequences of particular mergers may be demonstrated in rebuttal. We shall examine first a number of market factors other than seller shares, such as entry barriers, and then several other relevant factors, such as the vitality and prospects of the merging parties which affect the significance of past market shares.

E. *Entry Barriers To The Organic Pigment Industry Are Substantial, But Entry Remains Unimpeded*

There are no important entry barriers into the organic pigment industry in terms of key raw materials or production technology. (F. 631). However, capital requirements for the construction of production facilities are substantial. (F. 633). Also, the product testing and approval system prevalent in some user-segments of the industry can cause delay in entry. (F. 640). However, my overall assessment of the entry barriers is that they are substantial but moderate,[18] a

[14] *See* Kaysen and Turner, *Antitrust Policy*, at 30, 72.

[15] *See* IV *Antitrust Law*,¶ 911f at 65.

[16] *See* IV *Antitrust Law*,¶ 911a, 911f, 915 at 61, 66–67, 83.

[17] *See* IV *Antitrust Law*,¶ 910a at 54.

[18] The *Rhinechem* court found that entry barriers were "substantial" in the organic pigment industry. *FTC v. Rhinechem Corp.*, 459 F. Supp. 785, 789–90 (N.D. Ill. 1978).

conclusion supported by the unimpeded entry and continued growth of small firms during the recent years. (F. 642, 699–707).

Complaint counsel argue, however, that except for American Hoechst (about [***] share in 1978), there has been no significant or substantial entry into the market. They would disregard an impressive number of small entrants which are profitable and growing rapidly since their entry. This argument is unpersuasive. The thrust of the claim that entry barriers are low is not that competition will not be lessened substantially because the market has been significantly deconcentrated due to substantial and effective entries, but that the anticompetitive effect will not endure as long as it would if entry barriers were high enough to impede entry effectively. In this case, the fact of unimpeded entry of firms which have established solid market positions, are prosperous and growing, evidences moderate entry barriers.[19] [184]In the final analysis, the condition of entry is a neutral factor in this case: it does not argue either for a lower or higher threshold level of presumptive ban with respect to the BWC-CPD merger.

F. *The Elimination Of Direct Competition Was De Minimis*

The evidence shows that, although the merging firms competed in the organic pigment market, the direct competition between them was *de minimis* for two reasons: (1) BWC was an insignificant factor and (2) they sold largely heterogeneous pigment products. First, although BWC bears the "BASF" name, known as a world leader in industrial chemicals and colorants, it has for years remained a small import operation as far as organic pigments are concerned. With all its "big name" aura, BWC was an insignificant factor with a less-than-2% share.[20] (F. 587, 619–24).

Secondly, the bulk of CPD's organic pigment business was with the printing ink producers and consisted mainly of flushed colors. BWC, however, had no flushed colors to sell. The product overlap between CPD and BWC was limited to dry pigments for all practical purposes. (F. 608–15). *See Coca Cola Bottling Co.,* 93 F.T.C. 110, 205–07 (1979); *Heublein, Inc.,* 96 F.T.C. 385, 580–81 (1980).

G. *The Argument That BWC's Competitive Significance Is Understated By Its Past Market Share*

Complaint counsel's argument that BWC's past market share understates BWC's true competitive potential is equally unpersua-

[19] *See* IV *Antitrust Law,*¶ 917b at 86–89. This is not to say that the organic pigment market is characterized by ease of entry.

[20] *Cf. Tenneco, Inc.,* 3 Trade Reg. Rep. at 22,157–58, n. 62 (1982) (The FTC does not view a foreign firm's dominant position in its domestic market as highly probative of even its potential market share in the United States).

sive. Granted that BWC is not the same as any other importer-seller with a 2% share of the market. It is a part of the world-class chemical giant we know as BASF. In principle, BWC can "draw" upon the vast financial and technological resources of BASF. But, all of that did not help BWC much in the United States market in the past. We have a glimpse of the reasons. Most important, BASF could not provide BWC with flushed colors. There is also evidence that BASF/BWC could not translate European research and technology into products for the United States automotive coatings industry, and [185]that BWC was unable to resolve technical problems quickly. (F. 659). And there were difficulties due to differences in pigments and pigment systems between Europe and the United States. (F. 419–31, 661–63).

Finally, there is no evidence of any new products, new processes, or new production plants under construction or coming on stream, which may be expected to increase BWC's market position significantly in the near future. In these circumstances, it would not be realistic to give much weight to BWC's future competitive "potential" in interpreting the market share evidence. *Cf. Tenneco, supra.*

H. *Imports As A Moderating Factor*

The parties agree that imports make it difficult for the industry firms to control the supply and prices and this is a moderating factor. Complaint counsel argue, however, that imports are controlled by a small number of foreign firms which also sell organic pigments in this country. However, these firms have an incentive to increase imports because their well-being and growth is largely dependent on the success of the import business. In any event, the bulk of imports are specialty pigments and the role imports can be expected to play is limited either way by that fact.

I. *Buyer Concentration Is Generally Low*

The record shows that although many of the users of organic pigments are large firms, buyer concentration is generally low except in the automotive coatings segment. (F. 647). To the extent that there are large buyers who buy in large volumes, that fact may have a moderating influence on prices. In any event, there is nothing in the record to suggest that buyer concentration will significantly affect the inferences to be drawn from market shares in this case.[21]

J. *There Are Other Factors Which Affect The Significance Of The Market Share Evidence*

There are two factors which indicate that the market share

[21] *See* IV *Antitrust Law*, ¶ 918 at 89–91.

evidence may overstate the true competitive significance of the [186] merging firms. First, the record clearly shows that CPD's previous owners failed to expend funds necessary to maintain the production facilities adequately and keep them reasonably up to date at the Huntington plant and that, as a result, the Huntington plant had seriously deteriorated. Indeed, the record evidence on this subject illustrates what disinvestment is and what it leads to. (F. 339–83).

Secondly, there is evidence that BWC suffered from significant marketing and technical difficulties selling BASF products to American users of organic pigments. (F. 189–98, 419–31, 662–63). These are obviously factors which affect BWC's future vitality and arguably tend to diminish whatever competitive significance attributable to its small market shares.[22]

K. *The Evidence Shows Vigorous Price Competition*

There is clear evidence of vigorous price competition in the organic pigment market and that smaller firms are especially aggressive price competitors. Although the industry firms publish price lists and register their "American Selling Prices" with the Government for tariff purposes, off-list prices and discounts are known to be common occurrences. This vigorous price competition is consistent with the widely-held view that the organic pigment industry has had significant overcapacity for some years. This view was also reflected in some contemporaneous marketing documents of industry firms. In any event, the record evidence of price competition is clearly at odds with any oligopolistic interdependence or price coordination in the organic pigment market. Indeed, the evidence of strong price competition present in this record is all the more significant in view of the highly user-oriented and service-intensive nature of the product market.

L. *There Is Evidence of Subnormal Profitability In The Organic Pigment Industry*

The record reflects a widely-held perception among industry witnesses that the profits or rates of return in the organic pigment market are low. And, as was the case with price competition, the low profitability of the industry firms appears to be related to "overcapacity." However, smaller firms appear generally prosperous and some are earning enough profits to expand significantly. The [187] evidence is clear that this mature industry has significantly more capacity than is needed to meet the demand with respect to a number of products. Mr. Glassman's view, based on his profitability

[22] *See* IV *Antitrust Law*,¶ 932 at 131.

study (RX 2131), that the rate of return in this industry is lower than that of other manufacturing industries, is consistent with other evidence in the record.

M. *The Smaller Firms Are Prosperous, Profitable And Growing Rapidly*

Although the organic pigment industry is concentrated, there is clear evidence that many smaller firms are prosperous, profitable and growing rapidly. (F. 699–707). It is true that most of these firms are specialized: their business for the most part is selling flushed pigments to ink producers. Their product lines are limited in that sense and they are not capable of competing with Sun Chemical, for example, across-the-board in every user industry. However, a small specialist can offer as many products to its customers as his diversified competitors can to the same customers. The point is that they do not need to offer a complete line of pigments in order to prosper, to grow and to earn an attractive return in this market. The evidence strongly suggests that the small firms do not believe in "live-and-let-live," and that they are not likely to live a "quiet life" or to acquiesce in controlled output or prices by the larger firms.

N. *The Proponent Of The Acquisition Has Met The Burden Of Rebutting The Presumptive Illegality Based On Aggregate Market Shares*

The presumptive illegality of the BWC-CPD merger is based on a low threshold level of 10% in a partially concentrated market. To begin with, there is authority which would raise the threshold to about 15% in cases where one of the merging firms has a market share of 2% or less. In sum, the presumption of illegality in this case was a relatively weak one.

The record does not contain clear quantitative evidence to establish that the market shares reflecting the "true" competitive significance of the merging firms would fall below the 10% threshold level.[23] However, I am persuaded that the kinds and quantum of evidence relating to the various factors other than seller [188] concentration which bear on competition and the competitive significance of this merger, reviewed and discussed hereinabove are clearly sufficient to overcome the relatively weak presumption of illegality based on a low threshold level of 10% aggregate market share.

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[23] *Cf.* IV *Antitrust Law,* ¶ 934 at 132–35.

O. *The Potential Competition Aspect Of The Case*

The record is clear that BASF/BWC was a likely potential entrant/expander in the organic pigment market. (F. 711–27).

Relying on *Heublein, Inc.,* 96 F.T.C. 385, 583 (1980) and the "potential expander" theory enunciated by the Commission in that case, complaint counsel contend that BWC ran afoul of Section 7 by acquiring a "leading firm" in the organic pigment market instead of constructing a production plant in the United States or acquiring a "smaller competitor." However, *Budd Co.,* 86 F.T.C. 518, 580–81 (1975), would appear dispositive of this argument inasmuch as the Commission there unequivocally held that an acquisition of a firm with 10% or less of the market is regarded as a toehold acquisition. The fact that there was an alternative acquisition candidate which was smaller than CPD in terms of market shares does not alter the conclusion that, according to *Budd Co.,* the CPD acquisition was a toehold acquisition.

In any event, one cannot overlook a certain incongruity in a two-sworded merger law enforcement policy which would attack a horizontal merger on the basis of presumptive illegality and, having failed, would condemn it with the sword of potential competition theory especially where, as here, the industry is not highly concentrated.

The record also fails to support complaint counsel's argument that BWC was a perceived potential entrant and that its acquisition entry constitutes an independent Section 7 violation. First, BWC was already in the market. Second, the CPD acquisition was a toehold acquisition according to *Budd.* Third, the evidence complaint counsel rely on to show competitors' perception of BWC as a potential entrant and the benefits accruing therefrom is vague, speculative and mixed. The record is devoid of any clearcut evidence demonstrating that any firm in the United States organic pigment market made a decision regarding prices or output by reason of its recognition of BASF/BWC as a potential entrant wating in the wings about to enter the market.

Finally, any elimination of potential competition by the challenged merger would be insubstantial for there are other potential entrants/expanders similarly situated as BWC. To name a few, Sandoz, Dainippon, Dainichiseika, and Toyo, all world-class chemical firms which sell imported organic intermediate and/or [189]pigment products in this country, are known to have bid for CPD or considered joint ventures in organic pigment production in the United States during the last few years. (F. 575–76, 730).

Conclusions of Law

1. The Federal Trade Commission has jurisdiction over the respondent and the subject matter of this proceeding.

2. Respondent BASF Wyandotte Corporation (BWC) is a Corporation organized under the laws of the State of Michigan, with its principal place of business at 100 Cherry Hill Road, Parsippany, New Jersey.

3. Chemetron Corporation (Chemetron) is a corporation organized under the laws of the State of Delaware, with its principal place of business at 111 E. Wacker Drive, Chicago, Illinois. Chemetron is a wholly-owned subsidiary of Allegheny International (Allegheny), a corporation organized under the laws of the State of Pennsylvania, with its principal place of business at 2700 Two Oliver Plaza, Pittsburgh, Pennsylvania.

4. At all times relevant to this proceeding, BWC has been engaged in the sale of organic pigments in interstate commerce and the assets of BWC and Chemetron have been and are used in interstate commerce, and BWC and Chemetron are engaged in commerce as "commerce" is defined in the Clayton Act, as amended, and the businesses of BWC and Chemetron are in or affecting commerce as "commerce" is defined in the Federal Trade Commission Act, as amended.

5. On November 17, 1978, BWC and Allegheny entered into a definitive agreement which provided, *inter alia,* for the acquisition by BWC of the assets of Chemetron Pigments Division of Chemetron Corporation (CPD). On March 23, 1979, BWC acquired the assets, business, and property of CPD.

6. The relevant product market is the organic pigments market.

7. The relevant geographic market is the United States consisting of the 50 states, the Virgin Islands, and Puerto Rico.

8. The organic pigments market is concentrated.

9. There are substantial barriers to entry into the manufacture and sale of organic pigments, but entry of new firms remains unimpeded.

10. Prior to the acquisition, BWC and CPD were and had been for many years actual competitors of each other in the organic pigments market and actual competitors of others in the organic pigments market throughout the United States. **[190]**

11. In 1978, BWC accounted for 1.7% and CPD, 8.9% of the United States organic pigment market.

12. In 1978, BWC accounted for 4.2% and CPD, for 10.3% of the alleged phthalocyanine pigments market.

13. BASF AG, a worldwide leader in the production and sale of organic pigments, was a potential entrant/expander in the organic pigment market in the United States.

14. The acquisition produced a combined market share of more than 10% in the organic pigment market and constitutes a presumptive violation of Section 7 of the Clayton Act, as amended, and Section 5 of the Federal Trade Commission Act, as amended.

15. The record contains sufficient evidence to overcome the presumption of illegality in the following ways, among others:

(a) The organic pigment market is characterized by vigorous price competition;

(b) There is evidence of overcapacity which tends to spur price competition and depress profitability;

(c) There is evidence of subnormal profits in the organic pigment industry;

(d) Small firms are growing rapidly and are generally more profitable than large firms;

(e) The direct competition eliminated by the BWC-CPD merger was *de minimis.*

16. The potential competition eliminated by the BWC-CPD merger was *de minimis.*

17. The BWC-CPD acquisition was a toehold acquisition and may be procompetitive.

18. Complaint counsel have failed to establish, by a preponderance of credible evidence, that the acquisition of CPD by BWC is a violation of Section 7 of the Clayton Act or Section 5 of the Federal Trade Commission Act, as alleged in the Complaint.

Accordingly, the following order will be entered. **[191]**

ORDER

It is ordered, That the Complaint be, and the same hereby is, dismissed.

FINAL ORDER

The Administrative Law Judge filed an Initial Decision dismissing the complaint in this matter on May 14, 1982, and service on the parties was completed on May 26, 1982. No appeal from the Initial Decision has been filed. The Commission has determined that the case should not be placed on its own docket for review and that the Initial Decision should become effective as provided in Rule 3.51(a) of the Commission's Rules of Practice (16 C.F.R. 3.51(a)). By operation of Rule 3.51(a), the Commission adopts the Administrative Law Judge's order of dismissal as its decision in this matter. The precedential significance of all or any part of this dismissal in future Commission proceedings will depend entirely on the persuasive weight the Commission determines that it should bear in such proceedings. Accordingly,

It is ordered, That the Initial Decision dismissing the complaint herein shall become effective on July 13, 1982.