

FEDERAL TRADE COMMISSION DECISIONS

Complaint

93 F.T.C.

IN THE MATTER OF

KAISER ALUMINUM & CHEMICAL CORPORATION

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

Docket 9080. Complaint, April 27, 1976 — Final Order, May 17, 1979*

This order requires, among other things, that an Oakland, Calif. manufacturer of various products divest itself completely, within one year from the effective date of the order, of the Lavino Division of International Minerals & Chemicals Corporation, subject to Commission approval; and refrain, for three years, from hiring any individual employed by the purchaser. The order further prohibits respondent from acquiring any business engaged in manufacturing, distributing, or selling basic refractories, for a period of ten years; and provides for arbitration, should disputes arise between respondent and the acquirer.

Appearances

For the Commission: *Tom D. Smith, Kenneth A. Ross and George S. Cary.*

For the respondent: *Robert A. Hammond, III, Gary D. Wilson, James R. Farrand, Stewart A. Block and Carol D. Weisman, Wilmer, Cutler & Pickering, Washington, D.C.*

COMPLAINT

The Federal Trade Commission, having reason to believe that Kaiser Aluminum and Chemical Corporation, a corporation subject to the jurisdiction of the Commission, has acquired the two operating basic refractory plants, inventory and related assets of the Lavino division of International Minerals and Chemical Corporation, a corporation, in violation of Section 7 of the Clayton Act, as amended, (15 U.S.C. 18), and/or Section 5 of the Federal Trade Commission Act, as amended, (15 U.S.C. 45), and that a proceeding in respect hereof would be in the public interest, hereby issues its complaint charging as follows:

* Amended by the September 8, 1977 order of the Administrative Law Judge, which added two new product markets: "B.O.F. bricks and shapes" and "conventionally bonded basic bricks and shapes."

I. Definitions

1. For the purpose of this complaint the following definitions shall apply:

(a) Basic refractories are non-metallic insulating materials composed predominately of magnesia, magnesite, dolomite, chromite, or chrome ore, or a combination thereof.

(b) Basic refractory bricks and shapes are non-metallic insulating materials composed predominately of magnesia, magnesite, dolomite, chromite, or chrome ore, or a combination thereof and which are formed during manufacture into bricks and other special shapes.

(c) Basic refractory specialties are non-metallic insulating materials composed predominately of magnesia, [2] magnesite, dolomite, chromite, or chrome ore, or a combination thereof and which are sold in a "bulk" or non-shaped form.

(d) Basic oxygen furnace (hereinafter "B.O.F.") bricks and shapes are basic refractory bricks and shapes which are bonded or impregnated with coal tar pitch.

(e) Conventionally bonded basic bricks and shapes are basic refractory bricks and shapes which do not contain coal tar pitch and in which mechanical strength is obtained by either a chemical bond or a ceramic bond without an intervening liquid phase.

II. Kaiser Aluminum & Chemical Corporation

2. Respondent Kaiser Aluminum and Chemical Corporation (hereinafter "Kaiser") is now and was at the time of the acquisition hereinafter described a Delaware corporation with its principal office and place of business at 300 Lakeside Drive, Oakland, California.

3. Kaiser is a fully-integrated aluminum producer and a highly-diversified industrial corporation engaged in a number of enterprises including, but not limited to, the production of agricultural chemicals, industrial chemicals, refractories materials and strontium products. In addition, Kaiser is engaged in commodities trading and owns fifty percent of Kaiser Aetna, a large real estate development firm. Kaiser also is engaged in mining or manufacturing in more than a dozen other countries. Kaiser Steel Corporation, an affiliated corporation of Kaiser, is a major consumer of basic refractories and is supplied primarily by Kaiser.

4. In 1973, Kaiser and its subsidiaries had total sales and revenues of \$1.28 billion, net income before extraordinary items of \$66.54 million, and total assets of \$1.81 billion. Kaiser was ranked by

Fortune magazine as the 133rd largest in sales and 67th largest in assets in 1973 among the nation's industrial corporations.

5. Kaiser, prior to the acquisition, operated seven refractory plants in the United States and, in whole or in part, owned six additional plants located in as many other countries.

6. Prior to and since the acquisition Kaiser has been a leading domestic supplier of refractories to the steel, cement and glass industries. [3]

7. In 1973, Kaiser had total domestic refractory shipments of \$65.8 million, representing 8.4% of the total United States shipments of refractory products.

8. In 1973, Kaiser had total domestic basic refractory sales of \$38.5 million, representing 15.7% of the total United States sales of basic refractory products and ranked number two among the nation's basic refractory producers.

9. In 1973, Kaiser had total domestic basic refractory bricks and shapes sales of \$21.4 million, representing 12.2% of the total United States basic refractory bricks and shapes sales and ranked number five among the nation's basic refractory bricks and shapes producers.

10. In 1973, Kaiser had total basic refractory specialties sales of \$17.1 million, representing 24.4% of the total United States basic refractory specialties sales and ranked number one among the nation's basic refractory specialties producers.

11. In 1973, Kaiser had total domestic sales of B.O.F. bricks and shapes of \$1.75 million, representing 3.9% of the total United States B.O.F. refractories sales and ranked sixth among the nation's B.O.F. bricks and shapes producers.

12. In 1973 Kaiser had total domestic sales of conventionally bonded basic bricks and shapes of \$18.5 million, representing 14.02% of the total United States conventionally bonded basic bricks and shapes sales and ranked number five among the nation's conventionally bonded basic bricks and shapes producers.

13. At all times relevant herein, Kaiser sold and shipped the relevant products throughout the United States and was and is now engaged in commerce as "commerce" is defined in the amended Clayton Act and in the amended Federal Trade Commission Act.

III. The Acquisition

14. On February 28, 1974, Kaiser, at a cost of \$16.9 million, acquired two basic refractory plants and related assets located at Plymouth Meeting, Pennsylvania and Gary, Indiana. These facilities comprised the Lavino Division of International Minerals and Chemical Corporation (hereinafter "Lavino"). [4]

IV. Lavino

15. In 1973, Lavino had refractory shipments of \$27.7 million representing 3.7% of the total United States shipments of refractory products.

16. In 1973, Lavino had basic refractory sales of \$27.7 million representing 11.3% of the total United States basic refractories sales and ranked number three among the nation's basic refractory producers.

17. In 1973, Lavino had basic refractory bricks and shapes sales of \$25.5 million representing 14.5% of the total United States bricks and shapes sales and ranked number two among the nation's basic refractory bricks and shapes producers.

18. In 1973, Lavino had basic refractory specialties sales of \$2.2 million representing 3.1% of the total United States basic refractory specialties sales and ranked number five among the nation's basic refractory specialties producers.

19. In 1973, Lavino had B.O.F. refractory bricks and shapes domestic sales of \$3.56 million, representing 7.9% of the total United States B.O.F. bricks and shapes sales, and ranked fourth among the nation's B.O.F. bricks and shapes producers.

20. In 1973 Lavino had total domestic sales of conventionally bonded basic bricks and shapes of \$20 million, representing 15.14% of the total United States conventionally bonded basic bricks and shapes sales and ranked number three among the nation's conventionally bonded basic bricks and shapes producers.

21. At all times relevant herein Lavino sold and shipped the relevant products throughout the United States and was engaged in commerce as "commerce" is defined in the amended Clayton Act and in the amended Federal Trade Commission Act.

V. Trade and Commerce

22. The relevant geographic market is the United States as a whole.

23. The relevant product market is the manufacture and sale of basic refractories. The relevant product submarkets are: [5]

- (a) manufacture and sale of basic refractory bricks and shapes;
- (b) manufacture and sale of basic refractory specialties;
- (c) manufacture and sale of B.O.F. bricks and shapes; and
- (d) manufacture and sale of conventionally bonded basic bricks and shapes.

A. Basic Refractories Market

24. Trade and commerce in the sale of basic refractories in the United States is substantial, with 1973 sales amounting to \$245.8 million.

25. In 1973, prior to the acquisition, concentration in the manufacture and sale of basic refractories was high with the top four firms accounting for 57% of sales and the top eight accounting for 86%.

26. By virtue of the acquisition of Lavino, Kaiser controlled facilities which accounted for 26.9% of the 1973 sales of basic refractories and became *pro forma* the leading manufacturer of basic refractories in that year.

27. On a *pro forma* basis the acquisition of Lavino by Kaiser increased the 1973 four-firm concentration from 57% to 66% and eight-firm concentration from 86% to 90% in sales of basic refractories.

28. There have been no new entrants into the manufacture and sale of basic refractories since 1962.

29. Barriers to entry into the manufacture and sale of basic refractories are high and are increasing.

B. Basic Refractory Bricks and Shapes

30. Trade and commerce in the sale of basic refractory bricks and shapes in the United States is substantial, with 1973 sales amounting to \$175.7 million.

31. In 1973, prior to the acquisition, concentration in the manufacture and sale of basic refractory bricks and shapes was high with the top four firms accounting for 66% of sales and the top eight accounting for 94%. [6]

32. By virtue of the acquisition of Lavino, Kaiser controlled facilities which accounted for 26.7% of the 1973 sales of basic refractory bricks and shapes and became *pro forma* the leading manufacturer of basic refractory bricks and shapes in that year.

33. On a *pro forma* basis the acquisition of Lavino by Kaiser increased the 1973 four-firm concentration from 66% to 79% and eight-firm concentration from 94% to 96% in sales of basic refractory bricks and shapes.

34. There have been no new entrants into the manufacture and sale of basic refractory bricks and shapes since 1962.

35. Barriers to entry into the manufacture and sale of basic refractory bricks and shapes are high and are increasing.

C. Basic Refractory Specialties

36. Trade and commerce in the sale of basic refractory specialties in the United States is substantial, with 1973 sales amounting to \$70.1 million.

37. In 1973, prior to the acquisition, concentration in the manufacture and sale of basic refractory specialties was high with the top four firms accounting for 80% of sales and the top eight accounting for 92%.

38. By virtue of the acquisition of Lavino, Kaiser controlled facilities which accounted for 27.5% of the 1973 sales of basic refractory specialties and strengthened its position as the largest manufacturer of basic refractory specialties in that year.

39. On a pro forma basis the acquisition of Lavino by Kaiser increased the 1973 four-firm concentration from 80% to 83% and eight-firm concentration from 92% to 94% in sales of basic refractory specialties.

40. There have been no new entrants into the manufacture and sale of basic refractory specialties since 1962.

41. Barriers to entry into the manufacture and sale of basic refractory specialties are high and are increasing. [7]

D. B.O.F. Bricks and Shapes

42. Trade and commerce in the sale of B.O.F. bricks and shapes is substantial, with 1973 sales amounting to \$45.1 million.

43. In 1973, prior to the acquisition, concentration in the manufacture and sale of B.O.F. bricks and shapes was high, with the top four producers accounting for 82.7% of sales, and the top eight accounting for 99.0%.

44. By virtue of the acquisition of Lavino, Kaiser controlled facilities which accounted for 11.9% of the 1973 sales of B.O.F. bricks and shapes.

45. On a pro forma basis, the acquisition of Lavino by Kaiser increased the 1973 four-firm concentration from 82.7% to 86.6% in sales of B.O.F. brick and shapes.

46. There have been no new entrants into the manufacture and sale of basic refractory bricks and shapes since 1962.

47. Barriers to entry into the manufacture and sale of B.O.F. bricks are high and are increasing.

E. Conventionally Bonded Basic Bricks and Shapes

48. Trade and commerce in the sale of conventionally bonded

basic bricks and shapes is substantial, with 1973 sales amounting to \$132.5 million.

49. In 1973, prior to the acquisition, concentration in the manufacture and sale of conventionally bonded basic bricks and shapes was high, with the top four producers accounting for 75.44% of sales, and the top eight accounting for 96.96%.

50. By virtue of the acquisition of Lavino, Kaiser controlled facilities which accounted for 29.16% of the 1973 sales of conventionally bonded basic bricks and shapes.

51. On a *pro forma* basis, the acquisition of Lavino by Kaiser increased the 1973 four-firm concentration from 75.44% to 84.86% in sales of conventionally bonded basic bricks and shapes.

52. There have been no new entrants into the manufacture and sale of conventionally bonded basic refractory bricks and shapes since 1962. [8]

53. Barriers to entry into the manufacture and sale of conventionally bonded basic bricks and shapes are high and are increasing.

VI. Effects of The Acquisition

54. The effects of the acquisition set forth in Paragraph 14 may be substantially to lessen competition or tend to create a monopoly in the relevant markets, in violation of Section 7 of the Clayton Act, as amended, and the acquisition constitutes an unfair method of competition and unfair act and practice within the meaning of Section 5 of the Federal Trade Commission Act, as amended, in the following ways among others:

(a) eliminating substantial competition between Kaiser and Lavino and among Kaiser, Lavino and other competitors in the relevant markets;

(b) significantly increasing the already high levels of concentration in the relevant markets;

(c) significantly raising the already high barriers to entry into the relevant markets;

(d) increasing and threatening to still further increase concentration in the relevant markets through additional mergers by other competitors; and

(e) strengthening the position of Kaiser in the relevant markets.

VII. Violations Charged

55. The acquisition set forth in Paragraph 14 constitutes a violation of Section 7 of the Clayton Act, as amended, (15 U.S.C. 18).

56. The acquisition set forth in Paragraph 14 constitutes a

violation of Section 5 of the Federal Trade Commission Act, as amended, (15 U.S.C. 45).

INITIAL DECISION BY JAMES P. TIMONY, ADMINISTRATIVE LAW
JUDGE

OCTOBER 12, 1978

PRELIMINARY STATEMENT

Respondent Kaiser Aluminum & Chemical Corporation is charged 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), for its acquisition on February 28, 1974, of two refractory plants and related assets of the Lavino Division of International Minerals & Chemical Corporation. [2]

The complaint issued by the Federal Trade Commission in this proceeding is dated April 27, 1976, and alleges that the acquisition may substantially lessen competition or tend to create a monopoly in the markets for the manufacture and sale of "basic refractories," "basic refractory bricks and shapes," and "basic refractory specialties." (Complaint ¶¶ 18, 37.)

In particular, the complaint alleges that the acquisition violated Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act by:

eliminating substantial competition between Kaiser and Lavino and among Kaiser, Lavino and other competitors in the relevant markets;

significantly increasing the already high levels of concentration in the relevant markets;

significantly raising the already high barriers to entry into the relevant markets;

increasing and threatening to still further increase concentration in the relevant markets through additional mergers by other competitors; and

strengthening the position of Kaiser in the relevant markets. (Complaint ¶ 37.)

Respondent filed its Answer on July 15, 1976, admitting in part and denying in part the allegations of the complaint. Respondent denied that its acquisition of the Lavino plants was unlawful, alleging that, *inter alia*, (1) the markets defined in the complaint were not valid markets in which to judge the effects of the acquisition, (2) technological and competitive changes in the refractories consuming and production industries had left Lavino with no competitive viability at the time of the acquisition, and (3) the actual

and probable effects of the acquisition were to increase rather than decrease competition in the refractories industry. (Answer pp. 7-15.)

Prehearing conferences were held in Washington, D.C., on July 26, 1976, October 26, 1976, November 3, 1976, May 18, 1977, and September 2, 1977. Extensive discovery was undertaken by both sides. Subpoenas were issued at respondent's request to a number of other refractories producers. Motions to quash those subpoenas were overruled. One subpoena was enforced in federal court. *FTC v. Dresser Industries, Inc.*, 1977-1 CCH Trade Cases ¶ 61,400 (D.D.C. 1977). [3]

After complaint counsel's motion dated August 1, 1977, the complaint was amended by adding two new product markets: "B.O.F. bricks and shapes" and "conventionally bonded basic bricks and shapes."

Presentation of complaint counsel's case-in-chief began in Washington, D.C. on December 1, 1977, and concluded on December 20, 1977. Presentation of Kaiser's defense began in Washington, D.C., on January 9, 1978, and continued through January 20, 1978. Additional defense hearings were held in San Francisco, California, from January 31 through February 3, 1978, and in Washington, D.C., on February 21 and March 2, 3, and 10, 1978. Complaint counsel presented a rebuttal witness on April 7, 1978. Stipulations and other exhibits were received thereafter, and the record was formally closed on July 21, 1978.

In total, 30 witnesses testified: 10 for complaint counsel and 20 for respondent. There are 768 exhibits in the record, 275 of which were introduced by complaint counsel and 493 by respondent. These include physical samples of refractory products and documents totalling almost 11,000 pages. In addition, there are over 4,000 pages of hearing transcripts.

The findings of fact include references to supporting evidentiary items in the record. Such references are intended to serve as guides to the testimony and the exhibits supporting the findings of fact. They do not necessarily represent complete summaries of the evidence supporting each finding. The following abbreviations have been used:

- Tr. - Transcript, preceded by the name of the witness and followed by the page number;
- CX - Complaint counsel's exhibit, followed by its number and the referenced page(s);
- RX - Respondent's exhibit, followed by its number and the referenced page(s);
- CPF - Complaint counsel's proposed finding;
- RPF - Respondent's proposed finding;

- AC - Amended Complaint; and
A - Respondent's Answer to the Amended Complaint. [4]

Definitions

For the purpose of these findings, the following definitions shall apply:

(a) Basic refractories are non-metallic insulating materials composed predominately of magnesia, dolomite or chrome ore, or a combination thereof. (Lowe, Tr. 68-69; Williams, Tr. 95, 97; Sack, Tr. 372; Rook, Tr. 543; RX 66B-F; RX 178M.)

(b) Basic refractory bricks and shapes are non-metallic insulating materials composed predominately of magnesia, dolomite, chrome ore, or a combination thereof and which are formed during manufacture into bricks and other special shapes. (Williams, Tr. 100; Sack, Tr. 373; Lawrence, Tr. 645.)

(c) Basic refractory specialties are non-metallic insulating materials composed predominately of magnesia, dolomite or chrome ore, or a combination thereof and which are sold in a "bulk" or non-shaped form. (Williams, Tr. 100; Sack, Tr. 375; Rook, Tr. 543-45; Lawrence, Tr. 641-42; Hummer, Tr. 756.)

(d) Basic oxygen furnace (hereinafter "BOF") bricks and shapes are basic refractory bricks and shapes which are bonded or impregnated with coal tar pitch. (Williams, Tr. 98; Sack, Tr. 374; Garber, Tr. 863; Lawrence, Tr. 873; Hummer, Tr. 755; Kappmeyer, Tr. 1294; Caito, Tr. 1657; CX 111G-H.)

(e) Conventionally bonded basic bricks and shapes are basic refractory bricks and shapes which do not contain coal tar pitch and in which mechanical strength is obtained by either a chemical bond or a ceramic bond without an intervening liquid phase. (Findings 183-185.) [5]

FINDINGS OF FACT

Introduction

A. Refractories

1. Refractories are materials that retain their physical shape and chemical identity when subjected to varying conditions of stress including rapid changes in temperature, physical impact, abrasion, pressure and chemical attack by hot gases or molten materials. (Williams, Tr. 95; RX 61"O"; RX 66B; RX 179E; RX 182M; CX 178L.)

2. Refractories are made from magnesia, chrome ore, dolomite, alumina, fireclay,¹ and silica. (Sack, Tr. 372; RX 66B-F; RX 178M; RX 179G; RX 182M.)

3. Refractories are classified as basic or acid (nonbasic) depending on the inherent chemical reactivity of the raw materials involved. (CX 178L; CX 179G; RX 61L; RX 66B.)

4. Refractories are produced in two general forms: "bricks and shapes" (hereinafter bricks) and "specialties." (Williams, Tr. 100; Sack, Tr. 375; CX 179G; RX 61L.)

5. The bricks range in sizes and configurations. They are commonly measured in terms of standard 9-inch equivalents. (CX 178Z14; RX 61L.)

6. Specialties are unformed compositions which come in lump, ground, powder or paste form. (Rook, Tr. 544-45; Lawrence, Tr. 642; Hummer, Tr. 756; Garber, Tr. 860; RX 61L-M; CX 179G.)

B. Preparation of Refractories

7. Preparation of refractories varies from little more than just mining and combining raw materials to complex grinding, screening, molding and firing procedures. (CX 178Z13; CX 179I; RX 66F-K.)

8. The first step in the production of refractories is to remove the impurities and fluxes from the raw materials. Next the raw materials are crushed, ground, screened and mixed. These operations vary depending upon the density, porosity, strength, spalling resistance and thermal characteristics desired in the finished refractory. (CX 178Z13; CX 179I-N; RX 66F.) [6]

9. At this stage the refractories are "specialties." If bricks are to be made, the raw materials, combined with appropriate "binders," are molded and dried. Most bricks are then fired.² Those which are not fired, known as chemically bonded bricks, are ready for packaging and shipping. (CX 179N-O.)

10. Firing of bricks, performed either in batch or tunnel kilns,³ causes a ceramic bond that provides the brick with high temperature strength. The nature of the bond depends on the kind of raw materials and binders and on the temperature at which the brick is fired. (Williams, Tr. 146-47; Caito, Tr. 1596-97; CX 179-O; RX 66K.)

11. After firing and cooling, some bricks are packaged and

¹ "Fireclay" is a nonbasic refractory containing less than 50% alumina. Nonbasic refractories containing more than 50% alumina are called "high alumina." (Williams, Tr. 95-96; Garber, Tr. 858.) Glossaries of industry terms are found at CX 95Z280; CX 205Z203; CX 232Z.

² "Fired" means cooked in a kiln at 2700 degrees Fahrenheit and up. (Lawrence, Tr. 660.)

³ In a "batch kiln" the kiln is raised off the floor, cars with the raw materials are pushed on a track under the kiln, the kiln is lowered and the firing takes place. In a "tunnel kiln" the cars roll through the kiln without the kiln being raised. (Williams, Tr. 118-19.)

shipped. (Williams, Tr. 104; Sack, Tr. 380; CX 179-O.) Other bricks are encased in thin plates of steel (known as cladding) (Williams, Tr. 104; Sack, Tr. 379), or are internally plated with steel. (Garber, Tr. 982.) Some bricks which have been fired are subsequently impregnated with tar. (Williams, Tr. 98; Sack, Tr. 381-82; Garber, Tr. 863.)

C. Refractory Uses

12. Refractories are used whenever it is necessary to confine or control high temperatures. They are used in a wide variety of applications from home fireplaces to nose cones of space capsules to various industrial applications. (CX 178G; CX 179E; RX 61"O".)

13. The industrial applications for refractories include steel furnaces, copper smelters, aluminum furnaces, cement kilns, glass melters, reactors in petroleum refineries, power generators and mineral processing equipment. (CX 178N; CX 179E; CX 182M; RX 61"O"-Z16.)

14. At least 80 percent of all basic refractories, on a dollar or equivalent basis, is sold to the steel industry. (Williams, Tr. 122; Sack, Tr. 388, 486; Rook, Tr. 574; Lawrence, Tr. 673; Hummer, Tr. 841; Garber, Tr. 878-81; Kappmeyer, Tr. 1269-70; Burriss, Tr. 1432; CX 20N; CX 111I; RX 60; RX 62D.) [7]

15. About 95 percent of all basic refractories purchased by the steel industry is used in open hearth furnaces (OHF), electric arc furnaces (EAF) and basic oxygen furnaces (BOF) (Garber, Tr. 880; Gaydos, Tr. 1194; Kappmeyer, Tr. 1268-70), in which iron is converted to steel and in argon oxygen decarburization (AOD) furnaces in which carbon steel is refined to form stainless steel.⁴ (Williams, Tr. 128, 129, 138, 154; CX 178Z21, Z25, Z28, Z30; RX 62H-Q; RX 66.)

16. Basic refractories must be used in the steel-making furnaces and handling equipment where they contact slag. Slag is created in the steel-making furnace when the impurities in the molten metal rise to the top of the bath.⁵ (Williams, Tr. 131.) Basic refractories resist the corrosive nature of slag. Nonbasic refractories cannot be used for this purpose. (Sack, Tr. 459-60.)

17. The open hearth furnace, which has decreased in importance in the last decade (CX 178Z26), is a relatively shallow container. A burner at one end of the furnace is fired and hot air and exhaust gases are blown across the bath and through a regenerator chamber

⁴ In 1973, the three steel-making furnaces were OHF's, BOF's and EAF's (RX 66Z2.) The AOD came into use in 1976. (Hummer, Tr. 768.)

⁵ The "bath" in a steel-making furnace refers to the puddle of liquid after the charge is heated and melts. (Williams, Tr. 131.)

at the other end of the furnace, heating the refractory bricks located there. The airflow is periodically reversed and the burners on the opposite end are fired. (Sack, Tr. 388; CX 178Z25; RX 61U.) In some OHF's, pipes are inserted in the roof through which oxygen is blown into the furnace to increase the temperature and to speed the chemical reactions. (Williams, Tr. 129.)

18. OHF's require large quantities of refractories for initial construction, substantial maintenance materials in the course of operation and a major rebuilding about every six months. (CX 178Z28; RX 61U.)

19. OHF's produce as much as 500 tons of steel per heat⁶ and each heat takes six to twelve hours. (RX 61U.) OHF's use about ten pounds of basic refractories per ton of steel produced. (RX 132I.) [8]

20. Electric arc furnaces usually produce steel from a cold charge of scrap metal, rather than from molten iron. EAF's are relatively deeper containers than OHF's and have roofs through which extend large electrodes. (Williams, Tr. 128; Kappmeyer, Tr. 1258; CX 178Z30; CX 180Z.)

21. EAF roofs and linings require refractory rebuilding every 10 to 60 days and EAF bottoms require rebuilding about once a year. (RX 61X)

22. EAF's produce about 350 tons of steel per heat and each heat takes three to five hours. (CX 180Z; RX 60-O.) EAF's use about ten pounds of basic refractories per ton of steel produced. (RX 132I-J.)

23. The basic oxygen furnace, a deeper container than OHF's or EAF's, which has no roof, has emerged as the primary steel-making furnace. (CX 178Z29.) Oxygen is blown from the top (or from the bottom in Q-BOP's—Kappmeyer, Tr. 1254) at very high velocities to remove the carbon from the iron and to form steel. (Williams, Tr. 138-39; Kappmeyer, Tr. 1251-53; CX 178Z29; RX 61U.)

24. BOF's produce about 100 to 300 tons of steel per heat and each heat takes about an hour. (CX 178Z28-Z30; RX 61U-X.) BOF's use four to seven pounds of basic refractories per ton of steel produced. (RX 132I; RX 249; RPF 64.)

25. Argon oxygen decarburization furnaces further remove the carbon and other impurities from steel. (Williams, Tr. 154; Sack, Tr. 402-05.)

26. In the early 1960's, most domestic steel was produced by OHF's. However, by 1969, BOF's were producing as much steel as OHF's; and by 1971, BOF's accounted for one-half of all domestic steel production. Today, BOF's produce two-thirds of all domestic

⁶ A "heat" is the "cycle of charging raw material to the furnace and discharging finished steel." (Williams, Tr. 135.)

steel. This technological development in the steel industry has had a major impact on the refractory industry. (Caito, Tr. 1589; RX 6A; RX 495—Herbst 41.)

27. BOF's do not use the same types of bricks used in OHF's because the temperature and turbulent activity in BOF's create severe conditions. (Caito, Tr. 1589; RX 60K; RX 61U.) [9]

28. OHF's, BOF's, EAF's and AOD's use a variety of types of basic refractories, although some types are suitable only for one furnace or for part of one furnace. (CX 178Z28-Z30.)

29. The types of refractories used in a furnace in large part depend upon how a furnace is zoned. All furnaces are zoned. Zoning is a process in which the furnace is built with various types of refractories in different patterns so that the entire furnace lining wears out at the same time. (Williams, Tr. 127; Sack, Tr. 390, 394, 400, 404; Garber Tr. 886.) It is customary to put a cheaper refractory in the low wear areas and the best refractory in the high wear areas. (Williams, Tr. 127; Sack, Tr. 390; Garber, Tr. 886; Gaydos, Tr. 1189; Kappmeyer, Tr. 1273.)

30. Zoning practices vary from plant to plant and from furnace relining to relining. (Williams, Tr. 127; Gaydos, Tr. 1189, 1193; Kappmeyer, Tr. 1281, 1290; Mittsoff, Tr. 1766; Ackerman, Tr. 1876-77.) Zoning decisions are based on the quality of steel produced (Garber, Tr. 1121; Kappmeyer, Tr. 1281; Ackerman, Tr. 1877), the size of the ingot manufactured (Gaydos, Tr. 1189), the source of scrap steel utilized (Garber, Tr. 1121; Gaydos, Tr. 1189; Ackerman, Tr. 1877) and the level of steel production (Williams, Tr. 128; Ackerman, Tr. 1877).

31. The quality of refractories is of critical importance in the steel industry. (Lawrence, Tr. 719; Garber, Tr. 1058-60; RX 60B.) The steel companies aim for the lowest possible refractory cost per ton of steel produced. (Garber, Tr. 1058-61.) Refractories producers meet with their steel customers to discuss production problems and research and development suggestions. (Lawrence, Tr. 721; Garber, Tr. 1060; Kappmeyer, Tr. 1399-1401.) Refractories producers also provide technical personnel to assist steel companies in selecting and installing refractories. (Garber, Tr. 1062.)

Respondent Kaiser

32. Respondent Kaiser Aluminum & Chemical Corporation is, and was at the time of the acquisition, a Delaware Corporation with its principal office and place of business at 300 Lakeside Drive, Oakland, California. (AC&A ¶ 2.) [10]

33. Kaiser is a fully integrated aluminum producer and a highly

diversified industrial corporation engaged in a number of enterprises, including the production of agricultural chemicals, industrial chemicals and refractories materials. In addition, Kaiser is engaged in commodities trading and mining or manufacturing in more than a dozen countries. (AC&A ¶ 3.)

34. In 1973, Kaiser and its subsidiaries had total sales and revenues of \$1.28 billion, net income before extraordinary items of \$44.54 million and total assets of \$1.81 billion. Kaiser was ranked by *Fortune* magazine as the 133rd largest in sales and 67th largest in assets among the nation's industrial corporations. (AC&A ¶ 4; CX 93V.)

35. Kaiser Refractories, a division of respondent Kaiser, manufactures and markets a broad line of refractory products. (CX 13E.)

36. Kaiser supplies refractory products to the iron and steel, glass, cement, petroleum, chemical and copper industries. (Knight, Tr. 2394; CX 13E-G.)

37. In addition to its United States refractories plants and sales offices, Kaiser has a refractories subsidiary in Oakville, Ontario, Canada; and owns interests in companies which manufacture and sell refractories in South America, Europe and Australia. (CX 95P.)

38. Kaiser began producing basic refractories in 1943 at Milpitas, California, (Knight, Tr. 2375) and later added plants at Natividad and Moss Landing, California. (Knight, Tr. 2377-78.)

39. During the 1950's, Kaiser became well established as a supplier of basic specialties to steel producers. (Knight, Tr. 2373, 2380.)

40. In 1956, Kaiser built a basic refractories plant at Columbiana, Ohio (Knight, Tr. 2381; CX 12Z-15; CX 88B; RX 68L), to enable Kaiser to expand its sales to the major steel producers. (Knight, Tr. 2382-83.)

41. In 1959, Kaiser acquired the Mexico Refractories Company of Mexico, Missouri. (Knight, Tr. 2383-84; CX 12Z16; RX 68G.) Mexico Refractories produced nonbasic refractories, including silica bricks and clay and alumina bricks and specialties at facilities located in Van Dyke, Pennsylvania; Niles, Ohio; Mexico, Missouri; and Frostburg, Maryland. (Knight, Tr. 2383; RX 63G.) In 1965, Kaiser bought Denver Fire Clay's refractories business. (CX 13Z11.) [11]

42. In the mid 1960's, in order to enlarge its capacity for producing basic bricks, Kaiser constructed high temperature tunnel kilns at Moss Landing and at Columbiana. (Knight, Tr. 2384-85; CX 12Z28.)

43. By 1970, Kaiser needed additional high temperature kiln capacity to produce higher performance basic bricks. (Knight, Tr.

2388-89; Adams, Tr. 2465-66, 2468, 2499; CX 100I.) Mr. Knight, a Kaiser vice-president, contacted International Minerals & Chemical Corporation (IMC) to see if they might be interested in selling the Lavino plant at Newark, California. (Knight, Tr. 2390.) IMC declined, and Kaiser started a new kiln at Moss Landing. (Knight, Tr. 2390.) When the new kiln at Moss Landing was half completed, IMC contacted Mr. Knight to inquire whether Kaiser was still interested in the Newark plant. (Knight, Tr. 2390.) Kaiser declined, and the Lavino machinery at Newark was auctioned and its high temperature kiln was bulldozed. (Knight, Tr. 2390.)

44. In the late 1960's, Kaiser's Columbiana plant began producing BOF bricks. (Knight, Tr. 2391; Van Dreser, Tr. 2744-45.) In 1973, Kaiser sold \$1.6 million of tar bonded bricks. (Adams, Tr. 2569-70; Neely, Tr. 2807; CX 138D, *in camera*.)

45. By 1973, Kaiser was a vigorous and successful competitor in the sale of basic refractories to the steel, cement, glass and copper industries. (Knight, Tr. 2394.) Kaiser refractories division has historically been one of the most profitable companies in the basic refractories industry and one of the most profitable business segments of Kaiser. (CX 11E-G; CX 46A-C; CX 56Z23, Z32-Z33.)

46. By 1973, Kaiser was considering the possibility of either constructing or acquiring a facility for the production of raw materials used in making basic refractories. (Knight, Tr. 2404-05; Smith, Tr. 2817; CX 56Z4, Z6, Z8.)

47. Kaiser needed increased production capacity in 1973 for high quality basic bricks due to the continuing upgrading of refractories used in the industries served by Kaiser. (Knight, Tr. 2388-89, 2395-96; Adams, Tr. 2464, 2468-69, 2498-99; Van Dreser, Tr. 2760-71; CX 56Z8; CX 100D, *in camera*, I, J, N; RX 74B; RX 76C.) [12]

E. J. Lavino

A. Lavino As an Independent Company

48. E. J. Lavino and Company was founded by Edward J. Lavino in Philadelphia in 1887 and within a few years became a substantial importer of manganese, chrome ore and other mineral ores for sale to the American steel industry. (RX 111A; RX 112I; RX 115G.) World War I created a refractories shortage, and Lavino began making fireclay refractory bricks in a plant at Plymouth Meeting, Pennsylvania, where it had previously made building bricks. (RX 111C; RX 112J; RX 115H; RX 115K; RX 495—Herbst 13-14.)

49. After World War I, Lavino changed from the production of fireclay refractories to the production of basic refractories at the

Plymouth Meeting plant. (RX 111C; RX 115H; RX 495—Herbst 13-14.)

50. In the early 1950's, Lavino constructed a refractories plant at Newark, California, to obtain freight savings in products for the West Coast market. (RX 118Y; RX 495—Herbst 30.)

51. In 1960, Lavino constructed a plant for the production of raw materials used in basic refractories at Freeport, Texas. (Hall, Tr. 2224.)

52. Also in 1960, Lavino constructed a new basic refractories plant at Gary, Indiana, to supply steel producers. (Hall, Tr. 2205; RX 132Z14.)

53. Lavino was an innovative basic refractories producer. In 1962, Lavino produced the first direct bonded basic refractory brick.⁷ (Sack, Tr. 525; Hall, Tr. 2222-24.) Lavino was also the first to produce plastic chrome ore (1930); first to manufacture a fosterite bonded chrome/magnesia brick (1932); first to fire chrome and magnesia brick in continuous tunnel kilns (Plymouth Meeting - 1925); first to make chrome refractories for metallurgical furnaces (1920's); first to make refractories from Cuban chrome ore (1920's); first to make refractories from Philippine chrome ore (1940's); [13] first to make refractories from Transvaal chrome ore (1959); first to use sea water periclase⁸ for refractories (1938); first to use chemically and physically corrected calcine chrome ore for refractories (Cuban chrome ore processed in Plymouth Meeting - 1929); first to sell chrome refractories to the paper industry (1930's); first to design and construct a shaft kiln for firing high purity periclase at 4,000°F (Freeport - 1960); first to use 98% magnesia for refractories (1960); first to develop the 3" by 3" brick design for open hearth roofs (1959). (Hall, Tr. 2204-05, 2209-17; RX 114T.)

54. In 1963, Lavino added a tar bonding facility to its Gary plant and made its first attempt to get into the BOF refractories business. (Bergey, Tr. 2050; Hall, Tr. 2202-03, 2229-30.)

55. In 1966, Lavino sold to IMC its refractories business for approximately \$26 million. (Bergey, Tr. 2040-42.)

B. Lavino under IMC

56. In June of 1970, Dr. Marvin Gillis, a vice president at IMC who had assumed corporate responsibility for Lavino (Gillis, Tr. 143; Bergey, Tr. 2046), concluded that it would be to IMC's vantage to dispose of Lavino's assets. (Gillis, Tr. 1948-49, 1955-56.)

⁷ For definition of "direct bond" basic brick, see Finding 185.

⁸ "Periclase" is a high purity magnesia made synthetically by combining dolomite or limestone with sea water, bitterns or well brines. (Sack, Tr. 549; RX 66C.)

Accordingly, in late 1970, Dr. Gillis discussed with Babcock & Wilcox Co. whether that company might be interested in purchasing Lavino. Babcock & Wilcox determined that it was not interested in Lavino. (RX 224A; RX 225.)

57. In January of 1971, IMC made "changes in [Lavino's] management responsibility." (Bergey, Tr. 2058; RX 495—Herbst 70-71.) Of about 150 Lavino management personnel, IMC terminated 34 officers and employees and transferred 13 others. (Burris, Tr. 1455-60, 1499-1500; Bergey, Tr. 2058-59; RX 127D; RX 495—Herbst 69-71.)

58. This action, as well as statements that IMC wanted to sell its refractories business, damaged the morale of Lavino employees. (Bergey, Tr. 2059; Seelig, Tr. 2130-31.) [14]

59. IMC's overall management philosophy regarding Lavino in the early 1970's was to cut costs. (Kennedy, Tr. 2007-08; Hall, Tr. 2251-53.) Expenditures were limited to those things which were necessary to maintain the day-to-day operations of the business. (Gillis, Tr. 1952-53; Kennedy, Tr. 2008-09.) Pursuant to that policy, IMC tried to cancel the purchase of new presses but was not able to do so. (Hall, Tr. 2245, 2252.) Even after the presses were installed, the money needed for engineering and operational costs were not expended, and two Laeis presses, purchased at a total cost of more than \$800,000 to assist Lavino's BOF brick efforts, were never used for commercial brick production. (Hall, Tr. 2246-49; RX 193M.) Similarly, a Bickly kiln, purchased for \$300,000, was only used twice because it cost too much to operate. (Hall, Tr. 2249-51; RX 189I.)

60. Cost cutting policies affected Lavino's plant operations. Lavino, which had long been recognized for quality burned and direct bonded brick, began shipping bricks even though they were not in conformity with Lavino's product specifications. (Hall, Tr. 2254-55, 2257-58.) As a result, Lavino's reputation as a quality supplier began to slip, and some steel producers (including Bethlehem, which had long been Lavino's biggest customer) began arranging for alternative suppliers. (Young, Tr. 1796-97; RX 495—Herbst 79-81.)

61. In August 1971, IMC decided to close Lavino's Newark plant (Gillis, Tr. 1960; RX 129A-B; RX 130) contrary to the opinion of Lavino's refractories managers. (Hall, Tr. 2258-59; RX 495—Herbst 68.) The primary ground for their opposition was that closing the plant would weaken Lavino's sales to the copper and cement industries. (Hall, Tr. 2259; RX 495—Herbst 67-69, 101-03.)

62. The largest refractories company in Europe, Didier-Werke A.G., considered purchasing Lavino and in October of 1971, sent five of their personnel to spend two weeks in the United States analyzing

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Lavino's business. (Mahler, Tr. 2994-95.) Didier, however, decided that it was not interested in acquiring Lavino even though it found Lavino's products to be a good "top quality." (RX 137H.) Didier found that Lavino's sales force and technical service were undermanned. (RX 137L.) [15]

63. In 1972, IMC closed the Lavino Freeport magnesia plant (Gillis, Tr. 1961-62) and entered into a contract with Harbison-Walker for the purchase of direct bond and tar bond grade magnesia. (RX 362D, *in camera*.) Lavino was forbidden under the contract to use Harbison-Walker grain for tar impregnated brick. (Garber, Tr. 1020-21; RX 362D-E, *in camera*.)

64. The decision to close Freeport was made over the objections of Lavino's refractories management who were concerned that Lavino would be vulnerable to raw materials shortages in periods of high refractories demand. (Garber, Tr. 1032; Hall, Tr. 2260-62, 2326; RX 495—Herbst 68.) To keep Freeport in operation, however, further capital expenditures of about \$1 million would have been required to solve air pollution problems. (Gillis, Tr. 1962, 1982.)

65. IMC reduced Lavino's R&D expenditures from \$636,000 in fiscal 1971 to \$532,000 in fiscal 1972 to \$404,000 in fiscal 1973. (CX 125B; CX 127B; RX 190P, RX 190S; RX 192S; RX 194Q.)

66. The R&D cut backs were achieved by reducing expenditures for new equipment and in areas such as Lavino's pilot plant operation for making test quantities of new products including BOF bricks. (Hall, Tr. 2320-21.)

67. The ceramic engineers and other professionals in Lavino's R&D group, who were generally highly regarded in the industry, stayed with the company despite reduced expenditure levels (Hall, Tr. 2300, 2320-21; Van Dreser, Tr. 2655) and despite the fact that they received no pay raises for several years. (Van Dreser, Tr. 2657.)

68. By 1973, Lavino met the tar bonded and tar impregnated brick specifications established by Bethlehem Steel Company, one of the largest users of BOF bricks. (Burriss, Tr. 1471-73; Bergey, Tr. 2066-67; RX 139A; RX 143A; RX 495—Herbst 55.)

69. IMC liquidated the Newark plant in 1972. The machinery and equipment were auctioned off, the building and the direct bond kiln were bulldozed, and the property was sold for non-refractories use. (Gillis, Tr. 1959; Knight, Tr. 2390.) The Freeport plant was similarly dismantled and sold off for other purposes. (Gillis, Tr. 1961.) [16]

70. The refractories industry had a poor financial year in 1971. (CX 56P.) In the second half of 1972, the level of steel production increased, which led to increased refractories shipments. (RX 193W.) 1973 was a record steel production year. (RPF 63.)

71. By the end of 1974, only Lavinosa—a profitable South African chrome mining operation—remained a part of IMC. (RX 195Z3.) Of the 10 Lavino facilities acquired by IMC, five—Newark (refractories), Freeport (magnesia), York (ore grinding), Lynchburg (ferromanganese), and Sheridan (ferromanganese)—had been liquidated. (Burriss, Tr. 1420-21; Bergey, Tr. 2042-43; RX 495—Herbst 145.) Of the other five, Plymouth Meeting and Gary were sold to Kaiser; Eufaula (alumina) was sold to Harbison-Walker; Covington (manganese dioxide) was sold to Ray-O-Vac; and Port Richmond (ore grinding) was sold to Combustion Engineering. (Burriss, Tr. 1420-21; Bergey, Tr. 2042-43; RX 495—Herbst 145-46.)

72. Lavino had divisional earnings of \$3,433,000 in fiscal year 1968-69 (RX 186F), \$2,873,000 in fiscal year 1969-70 (RX 188F), \$17,000 in fiscal year 1970-71 (RX 190D), \$2,380,000 in fiscal year 1972-73 (RX 194C), and \$1,779,000 in the first half of fiscal year 1973-74 (RX 195B). During the depressed steel producing period, fiscal year 1971-72, Lavino had a divisional loss of \$340,000. (RX 192D, G.)

The Lavino Acquisition

73. In the fall of 1972, Kaiser considered acquiring International Minerals & Chemical Corporation (RX 74A; RX 74E) and its Lavino division. (CX 27; RX 74C; RX 77.)

74. Kaiser's initial interest in acquiring the Lavino refractories assets stemmed primarily from its desire to increase its capacity to produce direct bond basic brick. (Knight, Tr. 2395; Adams, Tr. 2468-69; RX 74B; RX 76C-E.) In early 1973, Kaiser was operating near its direct bond capacity; demand for direct bonded basic brick was projected to grow. (Knight, Tr. 2395-96; CX 59B; CX 100G.) [17]

75. In addition to furnishing additional high temperature kiln capacity, purchasing the Lavino plants would provide Kaiser with additional capability to produce tar bonded brick for use in BOF's. (Knight, Tr. 2397-98.) Also, the Plymouth Meeting, Pennsylvania, plant would enable Kaiser to compete more effectively in supplying the eastern steel mills; and the Gary, Indiana, plant would enable Kaiser to compete more effectively in the Chicago, fast-growing BOF market area. (Knight, Tr. 2398.)

76. An August 1973 report, prepared by Kaiser's refractories division, strongly recommended that the acquisition negotiations go forward based upon the predicted profitability of Lavino's plants. (CX 66D, G, L, O.)

77. In September 1973, Kaiser personnel visited Lavino's Plymouth Meeting and Gary facilities. (Adams, Tr. 2478-80; Bowman, Tr.

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2920; CX 69A.) They found that the kilns at Plymouth were in excellent condition and, because a third kiln had been converted to a high temperature capability, Lavino had more direct bond capacity than had previously been estimated. (Adams, Tr. 2479-80; Bowman, Tr. 2921; CX 69A, F.) They also found EPA and OSHA problems at the two plants and it was estimated that an additional \$1,800,000 would have to be spent to correct them. (Adams, Tr. 2478-79; Bowman, Tr. 2920-21; CX 69C, D.)

78. On November 9, 1973, Kaiser and IMC signed an earnest money agreement providing \$200,000 down payment in "earnest money" in exchange for IMC's permitting Kaiser personnel to conduct a detailed inspection of Lavino's facilities and books. (CX 68A; RX 78C; RX 79E; RX 80.) If Kaiser acquired the Lavino plants, \$200,000 was to be credited to the purchase price; and if Kaiser notified IMC within 30 days that it did not intend to pursue the acquisition, \$100,000 would be returned. (CX 68A; RX 79E-F; RX 80; RX 82B; RX 83A-B; RX 84; RX 86A-D.)

79. Kaiser prepared a "Lavino Division Acquisition Investigation 30-Day Evaluation," dated December 6, 1973. (Adams, Tr. 2481; CX 72A-Z7.) In the report, Kaiser continued to favor the acquisition and recommended that the investigation proceed. (Adams, Tr. 2504-05; CX 72C.) [18]

80. On January 18, 1974, Kaiser notified IMC that it intended "to enter into negotiations towards a definitive agreement of purchase and sale" of the Lavino refractories assets. (RX 98.) IMC and Kaiser signed the purchase agreement on March 5, 1974, with the sale effective February 28, 1974. (Adams, Tr. 2513-14; CX 1A; CX 1Z23.) The assets were acquired for \$2 million in cash and approximately \$13 million in promissory notes, with Kaiser assuming approximately \$2 million of Lavino's current liabilities. (Adams, Tr. 2513-14; CX 77A.)

81. One of the assets Kaiser acquired from IMC was a contract by which Harbison-Walker agreed to supply magnesia. Kaiser would not have purchased the Lavino assets without this contract. (Knight, Tr. 2414.)

82. Also as a result of the acquisition, Kaiser hired the majority of the professionals in Lavino's basic refractories research and development department, including Lavino's Director of R&D, Research Manager and Laboratory Section Manager, and all of Lavino's Research Engineers. Dr. Mikami, Lavino's R&D Director, became Kaiser's R&D Manager of Basic Refractories. Of the five individuals who for the past four years have constituted Kaiser's R&D Basic Refractories Products Development Section, four of them,

including the section head, are former Lavino R&D personnel. (Van Dreser, Tr. 2717-18, 2723-26; CX 84A-B; CX 105A-K.)

83. Kaiser terminated many of the Lavino marketing and sales personnel. (Adams, Tr. 2485-86; CX 66M.) This amounted to a savings of about \$900,000 per year. (CX 72U.)

84. At all times relevant herein, Kaiser was engaged in commerce as "commerce" is defined in the amended Clayton Act and in the amended Federal Trade Commission Act. (AC&A ¶ 13.)

85. At all times relevant herein, Lavino was engaged in commerce as "commerce" is defined in the amended Clayton Act and in the amended Federal Trade Commission Act. (AC&A ¶ 21.) [19]

Geographic Market

86. In 1973, Kaiser sold basic refractories in 36 states from either its Columbiana, Ohio, plant or its Moss Landing, California, plant. (CX 6B.)

87. In 1973, Lavino sold basic refractories in 32 states from either its Gary, Indiana, plant or its Plymouth Meeting, Pennsylvania, plant. (CX 38A-Q, *in camera*; CX 78A-S; CX 168H-I; CX 115.)

88. In 1973, Lavino and Kaiser sold basic refractories to 100 identical customer facilities in 33 states. (CX 38A-Q, *in camera*; CX 168H-I.) These 33 states accounted for 98 percent of the United States' steel production. (Williams, Tr. 168-69.)

89. Kaiser had general sales offices in California, Missouri and Ohio and district sales offices in 20 states throughout the United States. (CX 95F.)

90. Lavino warehoused basic refractories at its plants at Plymouth Meeting and Gary and at 10 other locations throughout the United States. (CX 22K.)

91. Lavino accounted for 20 percent of all basic refractories sold to the copper industry, even though copper smelters are located primarily in the West. Originally Lavino sold to the copper industry from its Newark, California, plant, but after it was closed it sold from its Gary and Plymouth Meeting plants. (Burris, Tr. 1519-20.)

92. Kaiser viewed the whole United States as the appropriate market in which to analyze desirability of the Lavino acquisition. (CX 60B; CX 64G-H; CX 66D.)

93. Basic refractories sellers and steel producing companies recognize the whole United States as the market for basic refractories. (Sack, Tr. 420; Rook, Tr. 577, 599; Hummer, Tr. 783; Burris, Tr. 1444; Caito, Tr. 1662; CX 221F; CX 270B.) [20]

Product Markets

A. Basic Refractories

94. Basic refractories are bricks and specialties, made from magnesia, chrome ore or dolomite, which react chemically at high temperatures, as a "base" as different from an "acid." (Williams, Tr. 96; Sack, Tr. 372; CX 111G.) Nonbasic refractories are made from fireclay, silica and alumina. (Williams, Tr. 95-96; Sack, Tr. 373; Lawrence, Tr. 642.)

95. About 90 percent of all refractories used in the steel industry are basic. (Kappmeyer, Tr. 1269.) About 94 percent of the refractories used in steel-making furnaces are basic. The refractories in OHF's are 98 percent basic; in BOF's and Q-Bop's are 100 percent basic; and in EAF's are 85 percent basic. (Sack, Tr. 397; Kappmeyer, Tr. 1270.)

96. Nonbasic refractories are not resistant to the basic slag and the high temperatures in the steel furnaces. (Williams, Tr. 262; Sack, Tr. 374, 459-60; Rook, Tr. 473; Garber, Tr. 939-41; Kappmeyer, Tr. 1272; Van Dreser, Tr. 2683-84.)

97. Basic bricks and basic specialties are used in place of each other or as companion products to control heat, both as initial materials and for maintenance. (Sack, Tr. 392, 395, 401; Rook, Tr. 576; Garber, Tr. 893, 1073; Kappmeyer, Tr. 1293; CX 95Z91; CX 256G.)

98. Steel furnace operators choose among various quantities of basic bricks and basic specialties according to the demand for steel. During times of high demand, they use basic specialties as a repair material, since basic specialties can be applied without shutting down the furnances. (Sack, Tr. 392; Kappmeyer, Tr. 1306-08.) The amount of basic specialties used in a furnace can exceed the amount of basic bricks. The range of use is from 98 percent basic bricks and 2 percent basic specialties to 32 percent basic bricks and 68 percent basic specialties. (Sack, Tr. 392; Garber, Tr. 1073; CX 270S.)

99. Basic bricks and basic specialties may be used separately or together in building furnace hearths. (Sack, Tr. 395; Kappmeyer, Tr. 1293.) [21]

100. Dollar Sales of Domestic Producers With \$1 Million
Or More In Sales Of Basic Refractories In 1973
(Thousands of Dollars)
(CX 139)

	<i>Total Basic Refractories</i>	<i>Basic Bricks</i>	<i>Basic Specialties</i>
Harbison-Walker	60,591	54,605	5,986
Kaiser	33,791	20,310	13,481
Basic Inc.	30,147	10,550	19,597
Lavino	26,467	23,614	2,853
General Refractories	25,880	21,547	4,333
Corhart	25,746	25,415	331

North American (NARCO)	22,374	22,250	124
Quigley	14,510	-	14,510
Martin-Marietta	13,375	-	13,375
J. E. Baker (DBCA)	9,267	4,617	4,650
A. P. Green	6,389	5,244	1,145
Marblehead Lime	4,411	-	4,411
Davis Firebrick	3,695	3,695	-
Valley Mineral	2,935	-	2,935
H. K. Porter	2,423	2,423	-
Combustion Engi- neering	1,009	-	1,009 [22]

101. Nine of the top ten producers of basic bricks also produced basic specialties. These nine producers account for 97 percent of all basic brick production and 60 percent of all basic specialty production. (Finding 100.)

102. Of the ten largest producers of basic specialties, six also produced basic bricks. (Finding 100.)

103. There are production advantages in producing both basic bricks and basic specialties because some of the same equipment is used. (Sack, Tr. 375; Hummer, Tr. 756-57; Garber, Tr. 876; CX 204Z42-Z49.) A basic refractories manufacturer may switch from producing basic bricks to basic specialties on the basis of customer demand. (Williams, Tr. 111-13.)

104. Basic refractories producers do not shift production facilities to nonbasic refractories during times of low demand for basics because of the contamination involved. Switching production facilities between basic and nonbasic refractories, and vice versa, takes months or even years. (Williams, Tr. 337-38; Lawrence, Tr. 671-72; Hummer, Tr. 774-75; Garber, Tr. 927, 934.) Contamination which might arise in the production of basic refractories made from different raw materials can be stopped by cleaning out the production facilities, allowing for a switch to a different basic refractory in a few hours. (Lawrence, Tr. 665-69.)

105. Basic refractories cannot be made on the same production line as nonbasic refractories. (Williams, Tr. 97; Rook, Tr. 584; Hummer, Tr. 775.) A few refractories manufacturers have produced basic bricks and nonbasic bricks at the same location—in different buildings. (Williams, Tr. 208; Sack, Tr. 373; Lawrence, Tr. 650.) But the walls must be air tight because dust from one can contaminate the other, causing deterioration. (Sack, Tr. 350.)

106. Refractories manufacturers, including Kaiser, distinguish between basic and nonbasic refractories in their product brochures (CX 95; CX 205; CX 230; CX 253) and their marketing studies. (CX 49A-E; CX 100; CX 214; CX 219.) Steel producing companies and

refractories manufacturers recognize basic refractories as a separate product market. (Williams, Tr. 96-97; Sack, Tr. 372; Rook, Tr. 544; Lawrence, Tr. 639, 642; Hummer, Tr. 755; Gaydos, Tr. 1177; Kappmeyer, Tr. 1269.) [23]

107. Kaiser recognizes basic refractories and nonbasic refractories as completely separate product lines. (CX 56N.) Kaiser keeps separate financial records (prices, sales, profits) for basic refractories and for nonbasic refractories. (CX 17; CX 18; CX 31; CX 40; CX 41; CX 51D; CX 102; CX 148.)

108. Manufacturers of basic refractories used in the steel industry do not consider the prices of nonbasic refractories in determining the prices of their basic refractories products. (CX 126D.)

109. Kaiser prices its basic refractories without regard to the prices of nonbasic refractories. (CX 32G; CX 56Q.)

110. Refractories companies have separate research and development departments for basic and nonbasic refractories. (Williams, Tr. 182; Sack, Tr. 426-27.)

111. Different sales personnel are used to sell basic and nonbasic refractories because of the need for different background knowledge. Technical sales specialists in the use of basic refractories assist field salesman in the steel industry. (Garber, Tr. 995; Hegeman, Tr. 1708.)

112. In more than 90 percent of all applications of basic refractories, nonbasic refractories cannot be substituted. (Sack, Tr. 528; Rook, Tr. 584; Kappmeyer, Tr. 1317; Burriss, Tr. 1436.)

113. Different persons buy basic refractories and nonbasic refractories in the steel industry. (Sack, Tr. 424-26; Hegeman, Tr. 1709-10; CX 110B.) The melt shop foreman (in charge of the steel-making furnaces) buys basic refractories. Nonbasic refractories are purchased by the person in charge of iron-making (blast furnaces) and steel heat treating and pouring. (Hegeman, Tr. 1710.) Steel companies buy from two to four basic refractories manufacturers at each plant. (CX 110C-D.)

114. Lavino and Kaiser had many identical customers. (CX 110D.) In 1973, twelve steel plants purchased more than \$200,000 in basic refractories from both Kaiser and Lavino. (RPF 421.) [24]

B. Basic Specialties

115. Basic specialties are insulating materials made of magnesite, dolomite or chrome ore (Rock, Tr. 544-45; Lawrence, Tr. 642; Hummer, Tr. 756.) These materials are crushed, ground, sized and mixed. They are neither bonded nor shaped. (Williams, Tr. 100, Sack, Tr. 375; Rook, Tr. 544; Lawrence, Tr. 641.) Nearly all basic specialties are used in the steel industry. (RPF 288.)

116. There are a number of types of basic specialties including, *inter alia*, mortars, ramming mixes, gunning mixes, plastics and castables. (Sack, Tr. 375; Rook, Tr. 544; Kappmeyer, Tr. 1303-04; Caito, Tr. 1615-19; RX 61.)

117. Mortars are used to lay bricks in furnaces. They are made in compositions that are similar to the bricks which they are holding. Mortars are used to make a consistent and continuous refractory lining. (RX 61M.)

118. Gunning mixes are generally used as a maintenance material (patch repairs) but also may be used as refractory linings in confined spaces. Gunning mixes are blown into position by air pressure (pneumatic gun) and are sticky enough to stay in place where they are fired. (Sack, Tr. 391; Garber, Tr. 893; Kappmeyer, Tr. 1305; RX 61M.)

119. Castables are predominately dry refractory materials which are mixed on site with water. They are particularly suited to the molding of very specialized shapes and parts at the installation site. They can be used for forming parts of furnace linings including doors and pits. (RX 61M.)

120. Plastics are ready to use refractory materials shaped in slabs or slices which are usually rammed into place. Heat converts the plastic materials to a solid consistency. Plastics are used as a maintenance material as well as used for forming the bottoms, walls and roofs of furnaces. (RX 61M.)

121. Ramming mixes are basic specialties that are rammed into place to create monolithic refractory surfaces. They are mostly used in furnace bottoms. (Sack, Tr. 391; Kappmeyer, Tr. 1309-10; CPF 159.) [25]

122. Different types of specialties are created by varying the raw materials and size of the fractions. Specialties are made by crushing and grinding raw materials, and segregating the raw materials according to fractions of the same size. The fractions are stored in separate bins. The raw material is then fed into mixers with chemical binders. (Williams, Tr. 111-12; Rook, Tr. 573.)

123. There is a trend towards increased use of gunning of basic specialties in BOF's. (Hummer, Tr. 760.)

124. The production of basic specialties is identical to the production of basic bricks up to the pressing stage. (Williams, Tr. 112-13; Lawrence, Tr. 641; Caito, Tr. 1592.) A basic brick manufacturer can therefore sell specialties merely by adding packaging equipment. (Williams, Tr. 112.)

125. Most producers of basic bricks sell basic specialties, however, many producers of basic specialties do not produce basic bricks.

(Caito, Tr. 1650-51; CX 204; RPF 298, 388, 397.) It costs less to produce specialties than bricks because some equipment necessary for the production of bricks such as brick presses, kilns and impregnators are not necessary for the production of specialties. (Hegeman, Tr. 1694.)

126. Most types of basic specialties can be produced at the same plant and many are produced on the same production line. (Williams, Tr. 111; Rook, Tr. 573; Caito, Tr. 1676; CX 159Z1-Z136; CX 204S-Z126.) Some must be kept separate. Plastic chrome ore specialties, for example, are not made at the same facility as magnesia specialties because of contamination problems. Some basic specialties manufacturers use different facilities for producing chrome ore and magnesia specialties (Garber, Tr. 937; Van Dreser, Tr. 2773; Bowman, Tr. 2905), while others use some of the same facilities. (Williams, Tr. 214-15; Lawrence, Tr. 704-05; CX 69; CX 204Z35; CX 204Z82.)

127. Contamination problems preclude specialties manufacturers from producing basic and nonbasic specialties on the same lines. (Williams, Tr. 113, 214-15; Rook, Tr. 563, 584; Lawrence, Tr. 670.) It takes at least six months to convert a basic line to a nonbasic line. (Rook, Tr. 585.) [26]

128. Basic specialties have different characteristics and end uses than nonbasic specialties. At least 90 percent of all basic specialties are used in the steel industry in OHF's, BOF's or EAF's. (Williams, Tr. 120, 166-67; Rook, Tr. 574; Lawrence, Tr. 688; Kappmeyer, Tr. 1304.)

129. Basic specialties are used in combination with basic bricks. (Williams, Tr. 166; Sack, Tr. 401; Kappmeyer, Tr. 1306.) Basic specialties are not used in combination with nonbasic bricks. (Williams, Tr. 166; Lawrence Tr. 687; Gaydos, Tr. 1190-91.)

130. Basic specialties and basic bricks are purchased by different persons in the steel industry. Basic specialties are sold to the steel producing superintendent and basic bricks are sold to the masonry superintendent. (Rook, Tr. 578.)

131. Martin-Marietta is the price leader in basic specialties. (Smith, Tr. 2832-33.) Prices of basic specialties remain firm in the face of price competition from sellers of nonbasic specialties. (CX 56Q.)

132. Basic specialties are recognized by steel producing companies and by basic refractories sellers as a separate product market. (Rook, Tr. 544; Kappmeyer, Tr. 1304-11; CX 16; CX 23; CX 49; CX 95Z91; CX 205Z27-Z29; CX 229Z15-Z20.)

133. Kaiser recognizes basic specialties and nonbasic specialties

as completely separate product lines. (CX 56N.) Kaiser keeps separate financial records (prices, sales, profits) for basic specialties and nonbasic specialties (CX 31; CX 41, CX 51D; CX 102) and recognizes basic specialties as one of the major refractories market sectors. (CX 56M; CX 95.)

134. Kaiser and Lavino both produced basic specialties in 1973. (Williams, Tr. 282, 288; Rook, Tr. 591; Kappmeyer, Tr. 1407; Neely, Tr. 2810; CX 95Z91.)

135. Kaiser's largest selling basic specialty in 1973 was Permanente-165, a magnesia ramming and gunning mix, used primarily for construction of hearths of OHF's and EAF's and for maintenance and repair of working linings of steel-making vessels. P-165 has good thermal resistance. (Knight, Tr. 2378-80; Van Dreser, Tr. 2683.) [27]

136. Lavino's largest selling basic specialty was Plastic-KM, a plastic chrome ore mix used almost exclusively in OHF and EAF doors and in non-steel industrial boiler applications. Chrome ore has less capacity to withstand basic slags and has a low melting point but it is highly resistant to spalling. (Williams, Tr. 288; Rook, Tr. 546; Garber, Tr. 1104; Van Dreser, Tr. 2692, 2701-02.) Lavino also sold some magnesia gunning mix. (Caito, Tr. 1628; CX 204Z82.)

C. Basic Bricks

137. The market for basic bricks includes five types: chemically bonded, direct bonded, regular burned, tar bonded and tar impregnated. (CX 30; CX 40; CX 66M; CX 113G-H; CX 213Z7; CX 219; CX 221B.) Basic bricks are made from magnesia and chrome ore, and, to a small extent, from dolomite. (CX 232R.)

138. In 1973, seven of the top ten basic brick manufacturers made all of the five types of basic bricks. (RPF 305; Williams, Tr. 598; Lawrence, Tr. 722; Garber, Tr. 863; CX 204.)

139. The advantages in producing all five types of basic bricks include: (1) shipping economies, (2) research and development economies, and (3) ability by the buyer who uses several basic refractories to line a furnace to place responsibility on one company for any defects. (Sack, Tr. 422-23; Kappmeyer, Tr. 1343; Burriss, Tr. 1448-54; Hall, Tr. 2281; Adams, Tr. 2510-12.)

140. There are few advantages in producing both basic and nonbasic bricks. (Sack, Tr. 423; Hegeman, Tr. 1707-08; Bergey, Tr. 2091; Hall, Tr. 2281; Adams, Tr. 2511-12.)

141. Research and development expertise in the basic brick area is not applicable to nonbasic bricks and vice versa. (Hegeman, Tr. 1707-08; Ackerman, Tr. 1919-20; Bowler, Tr. 2368.)

142. Refractories manufacturers producing both basic and nonba-

sic bricks employ engineers and other personnel who specialize in basic refractory research. (Lawrence, Tr. 654; Garber, Tr. 902; Hegeman, Tr. 1707-08; Van Dreser, Tr. 2714; Neely, Tr. 2779-80.) Such manufacturers also have specialized equipment for basic research. (Sack, Tr. 426-27; Bowler, Tr. 2368.) [28]

143. Nonbasic and basic bricks can be used in place of each other only in a few applications. (Williams, Tr. 263; Sack, Tr. 458-69; Burriss, Tr. 1435-36; see Findings 95, *supra*, and 171 and 199, *infra*.)

144. Contamination problems hinder the production of basic and nonbasic bricks in the same plants. (CX 159Z1-Z136; CX 207A.) Refractory companies which produce basic and nonbasic bricks at the same plant use completely separate production lines or house the lines in separate buildings. (See Findings 104 and 105, *supra*.)

145. The choice of which basic brick to use is made on the basis of a variety of factors, including thermal shock resistance, hot strength, slag resistance, and thermal conductivity. (Van Dreser, Tr. 2681-82; RX 132Z40.)

146. Research and development is critical to the success of a basic brick refractories manufacturer. (Lawrence, Tr. 697; Hummer, Tr. 779; Garber, Tr. 902; Adams, Tr. 2464.)

147. Competition in the basic brick market centers on the development of high quality products. (Williams, Tr. 182; Sack, Tr. 427; Lawrence, Tr. 697; Hummer, Tr. 779; Garber, Tr. 902, 1059; CX 12"O"-Q; CX 125H; CX 207Q; RX 422A.)

148. New basic brick products are generally an improvement upon prior products. (Williams, Tr. 184; Sack, Tr. 427; Lawrence, Tr. 697.) When one refractory company develops a new product the other refractory companies soon follow with their own versions of the "new" product. (Williams, Tr. 195; Van Dreser, Tr. 2677.) Lavino developed the first commercial direct bonded brick in 1962. (Sack, Tr. 428-29; Garber, Tr. 903; Hall, Tr. 2210.) Lavino was soon followed by Harbison-Walker (RX 495—Herbst 120) and eventually by every basic brick producer. (CX 100L.) In 1972, North American introduced a second generation direct bonded brick and Lavino followed shortly thereafter. (CX 125G.) [29]

149. In 1977, American refractories manufacturers started making a carbon bonded magnesia brick commonly referred to as "PMT." This product, copied from a product first used in Japan, is used at the slag line in EAF's. It is 28 percent carbon, compared to 4 percent carbon in a tar bonded brick. (Williams, Tr. 133-35, 185, 235-36; Sack, Tr. 406-08; Lawrence, Tr. 676-77; Garber, Tr. 1147.) It is relatively easy to make. (Williams, Tr. 346.)

150. All major types of basic bricks can be produced in a well-

equipped plant (Sack, Tr. 375-76; Hummer, Tr. 757-58; Garber, Tr. 872; Caito, Tr. 1598), and many are produced on the same production line. (Williams, Tr. 104-05; Sack, Tr. 378; Lawrence, Tr. 664-68; Garber, Tr. 874, 1138; Caito, Tr. 1659.)

151. BOF bricks can be produced in the same plant and use some of the same equipment as other types of basic bricks. (Williams, Tr. 105, 212.) Some manufacturers produce BOF bricks on alternate runs with other basic bricks. (Williams, Tr. 105; Garber, Tr. 874, 1138.) Such a shift takes between a half-hour and forty-eight hours. (Williams, Tr. 105; Garber, Tr. 1138; Caito, Tr. 1659.)

152. Some specialized equipment is necessary for the production of BOF bricks, including mixers and presses used to keep coal tar in a liquid form and tar impregnators. (Williams, Tr. 105, 212; Sack, Tr. 385.)

153. To produce tar bonded bricks at a plant equipped to make direct bonded bricks, it costs about one-half million dollars. The additional equipment to produce tar impregnated bricks costs about \$600,000. (Williams, Tr. 110.)

154. The five major types of basic bricks are produced by using the same raw material storage bins, batch cars, and crushing, grinding, sizing, mixing and pressing equipment. (Williams, Tr. 111; Sack, Tr. 376-79; CX 111Z10.) Some of the products use different finishing ovens. (CX 141.) [30]

155. In allocating production facilities among the types of basic bricks, refractories manufacturers predict production levels in consuming industries—primarily the steel industry. (CX 115I-L; CX 119A-M.)

156. Steel companies buy more than 80 percent on a dollar basis of all basic refractories bricks. (Garber, Tr. 880; Burriss, Tr. 1433; Caito, Tr. 1668-70; CX 221D; RX 132I.) They buy all of the major types of basic bricks. (Garber, Tr. 880; Kappmeyer, Tr. 1268; Burriss, Tr. 1433; Caito, Tr. 1668-69.)

157. An assured supply of magnesia is a prerequisite for effective competition in the basic brick refractory market. (Williams, Tr. 174; Sack, Tr. 431; Rook, Tr. 606; Garber, Tr. 1004; Gaydos, Tr. 1222; Hegeman, Tr. 1694-1700; Hall, Tr. 2260-63.) Basic brick manufacturers obtain magnesia either through vertical integration into magnesia production (Sack, Tr. 431-33) or through long-term supply contracts. (Rook, Tr. 642, 694; Hummer, Tr. 778.) In 1973, Kaiser and Harbison-Walker were the only basic refractories manufacturers which had completely integrated magnesia facilities. (CX 56"O".)

158. Basic brick producers follow the price leadership of Harbison-Walker. (Williams, Tr. 193-94; Lawrence, Tr. 699; Gaydos, Tr.

1202; Burriss, Tr. 1488; Mitsoff, Tr. 1770; Smith, Tr. 1821; Knight, Tr. 2427; Garber, Tr. 916.)

159. Basic bricks are recognized by steel producing companies and by refractories manufacturers as a separate product market. (Williams, Tr. 100; Lawrence, Tr. 641; Garber, Tr. 860; CX 113H; CX 178L; CX 219; CX 221B; CX 253Q.) Kaiser keeps different financial reports for basic bricks and for nonbasic bricks (CX 31; CX 41; CX 51D; CX 102), and recognizes basic bricks as one of the major refractories market sectors. (CX 56M.) [31]

D. BOF Bricks

160. BOF bricks are basic refractory bricks containing coal tar pitch ("tar"). There are two categories of BOF bricks: tar impregnated basic bricks, and tar bonded basic bricks. (Williams, Tr. 98; Sack, Tr. 374; Garber, Tr. 868; Lawrence, Tr. 873; Kappmeyer, Tr. 1294; Caito, Tr. 1657; CX 111G-H.)

161. Tar bonded and tar impregnated bricks are substitutable in the lining of basic oxygen steel-making furnaces. (Williams, Tr. 142; Lawrence, Tr. 673; Gaydos, Tr. 1182.)

162. Steel companies decide whether to purchase either tar bonded or tar impregnated bricks, based in part on the price of those products. (Williams, Tr. 142; Sack, Tr. 400; Hummer, Tr. 761.)

163. In 1973, almost all tar bonded and tar impregnated bricks were used in BOF's. (Williams, Tr. 267; Sack, Tr. 375, 397; Garber, Tr. 861, 886; Kappmeyer, Tr. 1296; Caito, Tr. 1667; CX 20M; CX 149D.)

164. BOF bricks vary in prices and quality. Advancing from the lowest in price and quality to the highest are tar bonded dolomite bricks, tar bonded dolomite and magnesia combinations, tar bonded magnesia and tar impregnated magnesia. (Sack, Tr. 400-01; Hummer, Tr. 761; Garber, Tr. 869-70; Gaydos, Tr. 1184; Caito, Tr. 1633.)

165. There is a trend towards an increase in the use of tar bonded bricks and a corresponding decrease in the use of tar impregnated bricks. This trend has resulted because of an increase in the quality of tar bonded bricks. (Sack, Tr. 400; Gaydos, Tr. 1184; Kappmeyer, Tr. 1300.)

166. Tar bonded bricks are made of magnesia and dolomite, and combinations thereof. (Williams, Tr. 138; Sack, Tr. 386; Lawrence, Tr. 678; Gaydos, Tr. 1180; Kappmeyer, Tr. 1294; Caito, Tr. 1657.) The raw materials are chemically bonded together with tar added at the mixing stage. (Williams, Tr. 142; Sack, Tr. 338-84; Garber, Tr. 861; CX 111H; RPF 24.) [32]

167. There is a trend away from the use of tar bonded dolomite bricks to the use of tar bonded magnesia brick in basic oxygen

furnaces. An increase in the price of dolomite would accelerate that trend. (Williams, Tr. 142; Sack, Tr. 400; Hummer, Tr. 760-61; CX 272A-B.)

168. Tar bonded bricks are sometimes tempered (*i.e.*, subjected to temperatures of between 300° and 800° F) to remove the volatiles from the tar and to avoid softening of the bricks in service. (Sack, Tr. 386; Garber, Tr. 862; RPF 24.)

169. Tar impregnated bricks in 1973 were made only of 100 percent magnesia. They are made by placing magnesia burned or bonded bricks in an autoclave to remove the air from the pores. The pores are then filled under pressure with hot tar. (Garber, Tr. 863; RPF 24.)

170. All working linings in BOF's are made of tar impregnated or tar bonded basic bricks. (Sack, Tr. 397; Lawrence, Tr. 678; Caito, Tr. 1671; Kappmeyer, Tr. 1295.)

171. Only basic bricks are used in BOF's. (Sack, Tr. 397; Lawrence, Tr. 674; Gaydos, Tr. 1184-85.) The basic slag which develops in the BOF during the steel-making process would destroy a nonbasic refractory. (Sack, Tr. 527.)

172. In 1973, 100 percent of all refractory bricks used in BOF's were tar bonded or tar impregnated basic bricks. (Sack, Tr. 397; Kappmeyer, Tr. 1270.)

173. In 1973, tar bonded and tar impregnated bricks not used in BOF's were only being used on a trial or experimental basis in working bottoms or subhearth of electric arc furnaces and in tundishes.* (Williams, Tr. 150, 159; Kappmeyer, Tr. 1296; Caito, Tr. 1622.)

174. Prior to the acquisition, both Kaiser and Lavino manufactured tar impregnated and tar bonded bricks. (Sack, Tr. 438; Lawrence, Tr. 691; Garber, Tr. 898; Gaydos, Tr. 1197; Burriss, Tr. 1429-30; Caito, Tr. 1629; CX 90"O"; CX 95Z73; CX 114K-L; CX 116G; CX 122; CX 123A-D.) Both companies were stepping up their marketing efforts in BOF bricks (Burriss, Tr. 1469; Hall, Tr. 2229; CPF 109; RPF 113) and forecasted increasing market penetration. (Burriss, Tr. 1469; CX 18; CX 21.) [33]

175. BOF bricks have continually improved. The consumption rate for refractory bricks in the working linings of BOF's dropped from approximately 19 pounds of refractory bricks per ton of steel in 1961 to about 4.1 pounds per ton of steel in 1973. (RPF 64; RX 249.) In 1977, the consumption rate was about 2.7 pounds per ton of steel. (RPF 64; RX 249.)

* A "tundish" is a large bathtub type vessel holding molten steel to be metered out into a continuous caster (Williams, Tr. 123.)

176. BOF bricks are recognized by steel producing companies and by refractories sellers, including Kaiser, as a distinct product market. (Sack, Tr. 374; Garber, Tr. 868; Gaydos, Tr. 1179; CX 16A-B; CX 17A; CX 21A-C; CX 41; CX 114A-L; CX 206Z46.) In 1971, Kaiser recognized BOF bricks as a "critical market." (CX 18.) Kaiser recognized that prices of BOF bricks were set without regard to prices of other basic or nonbasic bricks. (CX 32G.)

177. Both steel producing companies and refractories manufacturers recognized that Lavino and Kaiser were competitors in 1973 in the sale of BOF bricks. (Williams, Tr. 169-72; Sack, Tr. 438; Lawrence, Tr. 691; Hummer, Tr. 759-60; Garber, Tr. 897; Gaydos, Tr. 1197; Burriss, Tr. 1442-43; Mitsoff, Tr. 1768; CX 204Z144.) Lavino recognized that Kaiser was one of the four principal competitors in this market. (CX 111L.)

178. In 1972, Lavino sold BOF products to 19 steel plants, as many as the other top three BOF suppliers. During that year, Kaiser sold these products to three of the same BOF plants supplied by Lavino. (CX 114H-J; CX 123B-D.) Lavino products were purchased by six of the top ten BOF steel companies. (CX 114C.) Lavino's BOF bricks were reported in 1971 by Kaiser to be "establishing records in the industry." (RX 132L.) Kaiser acknowledged that they were an established BOF supplier prior to the acquisition. (CX 18; CX 111L.) In 1973, Kaiser planned a 50 percent increase in sales volume of its BOF bricks because of an improvement in the quality of its product. In 1972, Kaiser sold as many BOF bricks as it could produce. (CX 32G.) Kaiser and Lavino both sold BOF products to four of the same steel companies in 1972. (CX 123B-D.) [34]

E. Conventionally Bonded Basic Bricks

179. There are three categories of conventionally bonded bricks: chemically bonded bricks, regular burned bricks and direct bonded bricks. (Williams, Tr. 98; Sack, Tr. 374; Garber, Tr. 861; Mitsoff, Tr. 1744; CX 116Z2; CX 230Z11-Z40; CX 253G; CX 952Z71-Z90.) These categories of basic bricks are used in the refractories industry. (CX 113H; CX 221F.) Kaiser also recognized and used these three categories. (CX 32C-D; CX 40.)

180. More than 95 percent of all conventionally bonded bricks are manufactured from magnesite, chrome ore, or combinations thereof. (Sack, Tr. 374; Lawrence, Tr. 642; Garber, Tr. 859; Gaydos, Tr. 1177; CX 95; CX 139; CX 205Z3-Z4.)

181. Less than 5 percent of all conventionally bonded bricks are manufactured from dolomite. (CX 139.) Dolomite has a shorter shelf

and furnace life than magnesia. The price of dolomite depends on the price of magnesia. (Sack, Tr. 404; Hummer, Tr. 780; CX 272.)

182. The quality and the price of magnesia/chrome ore conventionally bonded bricks depends upon the ratio of magnesia to chrome ore (Williams, Tr. 127), upon the grade of magnesia and chrome ore (Lawrence, Tr. 712; Van Dreser, Tr. 2686-90), and upon the method of bonding the raw materials together. (Williams, Tr. 127.)

183. Generally, the cheapest and least durable conventionally bonded basic brick is the chemically bonded brick in which the raw materials are bonded together by chemical additives.¹⁰ (Williams, Tr. 127, 146; Sack, Tr. 375; Lawrence, Tr. 679-80; Garber, Tr. 887; CX 111G.)

184. A more expensive and more durable conventionally bonded brick is the regular burned brick in which the basic raw materials are bonded together by firing the brick in a kiln at temperatures of about 2750°-2900°F.¹¹ The firing creates a ceramic bond. (Williams, Tr. 127, 146; Sack, Tr. 376; Lawrence, Tr. 679-80; Garber, Tr. 861, 887.) [35]

185. The most expensive and durable conventionally bonded brick is the direct bonded brick in which the basic raw materials are bonded together by firing the brick in a kiln at temperatures of about 3200° F and above.¹² The firing creates a direct bond between the magnesia and the chrome ore. (Williams, Tr. 146-57; Sack, Tr. 375; Garber, Tr. 861, 867; Adams, Tr. 2590-91.)

186. Each of the types of conventionally bonded bricks may be produced interchangeably on the same production line in a plant with a high firing capacity kiln. In 1973, six of the manufacturers of basic bricks had this capacity. (RPF 305; Williams, Tr. 105; Sack, Tr. 377-79; Lawrence, Tr. 658-68; Garber, Tr. 864-65, 1137; CX 64C; CX 118Z2; CX 168L-P.) The basic raw materials for each type are crushed and ground in the same ball and rod mills, and mixed and pressed into shapes in the same mixers and presses. (Williams, Tr. 105; Sack, Tr. 377-78; Lawrence, Tr. 656-68; Garber, Tr. 874.)

187. Shifting production from one type of conventionally bonded brick to another requires a change in the raw materials and a change in the temperature at which the brick is fired. (Sack, Tr. 379; Lawrence, Tr. 660-62; Garber, Tr. 864, 1137.) General Refractories varies its production of regular burned, direct bonded and chemically bonded basic bricks, on the same facilities, up to twenty times a year to meet demand. (Lawrence, Tr. 664-68.)

¹⁰ Chemically bonded bricks are also called "unburned." (CX 32C.)

¹¹ Regular burned bricks are also called "burned" (CX 32C) and "conventional burned." (CX 218.)

¹² Direct bonded bricks are also called "high fired." (CX 221F.)

188. To change the kiln temperature from direct bond temperatures to regular burned temperatures takes five to eight hours and from regular burned temperatures to direct bond temperatures twelve to twenty-four hours. (Williams, Tr. 108; Garber, Tr. 1137.)

189. It costs several millions to add high firing kiln capacity to convert a plant producing chemically bonded bricks to a plant producing direct bonded bricks. (Garber, Tr. 929.) [36]

190. Most basic brick manufacturers produce chemically bonded, regular burned and direct bonded bricks. (Williams, Tr. 94; Sack, Tr. 375-76; Lawrence, Tr. 647-49; Garber, Tr. 870-71; RPF 305.) The capacity of the plants varies depending upon the specific product mix at any given time. (Williams, Tr. 111; Hummer, Tr. 758; Garber, Tr. 875; CX 22G; CX 64C; CX 168C-K; CX 273.)

191. Nonbasic bricks are not produced on the same production line as conventionally bonded basic bricks (Sack, Tr. 373; Lawrence, Tr. 650) and rarely are they produced in the same plant. (Williams, Tr. 94; Caito, Tr. 1661.)

192. About half of the conventionally bonded basic bricks are sold to the steel industry. (CX 20N.) Over 90 percent of these bricks are used in the working or safety linings of OHF's, EAF's and AOD's. (Lawrence, Tr. 679; Kappmeyer, Tr. 1270, 1277.)

193. The rest of the conventionally bonded bricks are used in various other industrial applications, including burning zones of cement kilns (Lawrence, Tr. 685; Garber, Tr. 890), copper reverberators (Lawrence, Tr. 686; Garber, Tr. 892-93) and the checkers of glass furnaces. (William, Tr. 253; Sack, Tr. 472; Lawrence, Tr. 686; Garber, Tr. 890; CX 113H.)

194. There is a trend towards using direct bonded basic bricks where regular burned bricks were previously used (Williams, Tr. 127, 148; Sack, Tr. 409; CX 66J) because furnace operators are demanding increasing lining lives. (Sack, Tr. 411; Garber, Tr. 975; Adams, Tr. 2590; CX 255.)

195. Fused cast basic bricks are used in OHF's, EAF's and AOD's. (Sack, Tr. 392; Garber, Tr. 882; Ackerman, Tr. 1854-55.) In 1973, this product was produced only by Corhart Refractories Co. (Williams, Tr. 131; Sack, Tr. 393; Ackerman, Tr. 1890-91.)

196. The fused cast basic brick is manufactured by an entirely different process than regular burned, chemically bonded and direct bonded bricks. Fused cast bricks are made by fusing refractory raw materials together into a liquid, pouring the molten material into a mold, letting it cool, and sawing brick shapes from this cooled mass. (Williams, Tr. 131; Sack, Tr. 393; Ackerman, Tr. 1853.) [37]

197. Fused cast bricks are so expensive in relation to other basic

bricks that in 1973 they were used only at the slag lines and hot spots of some steel-making furnaces. (Garber, Tr. 1147; Ackerman, Tr. 1928; CX 269B.) Recently, this application of fused cast bricks has been diminished by the use of water cooled side panels and PMT bricks in EAF's. (Williams, Tr. 238; Garber, Tr. 1147; Ackerman, Tr. 1869-70.)

198. In 1973, BOF bricks were not substituted for conventionally bonded basic bricks. (Lawrence, Tr. 685.) BOF bricks would not be functional in most applications where conventionally bonded bricks are used because, for instance, in AOD's the tar in BOF bricks would be burned out leaving only granular magnesia. (Sack, Tr. 406; Garber, Tr. 939-41.)

199. In 1973, nonbasic bricks were not used in place of conventionally bonded basic bricks except in a few minor applications including burning zones of rotary kilns (Williams, Tr. 165; Burriss, Tr. 1436), regenerators of glass furnaces (Burriss, Tr. 1436), ladles and tundishes (Williams, Tr. 164; Sack, Tr. 459; Kappmeyer, Tr. 1316; Burriss, Tr. 1434), and in some EAF roofs (Williams, Tr. 164, 263; Sack, Tr. 458-59; Burriss, Tr. 1435.) When a cold charge is used in an EAF, the roof must be made of basic refractories because slag reaches the roof; when a hot charge is used, the cheaper nonbasic roof can be used since the slag does not then reach the roof of the furnace. (Williams, Tr. 275.) More EAF's now have basic roofs than in 1973. (Williams, Tr. 148.)

200. Basic refractories manufacturers, including Kaiser, recognize and keep separate financial records (sales, costs, profits) for direct bond, regular burn, and chemically bond basic bricks. (CX 32B; CX 40; CX 113H; CX 218; CX 219; CX 247; CX 253Q.)

201. Both Kaiser and Lavino produced chemically bonded, regular burned and direct bonded basic bricks (Lawrence, Tr. 701; Garber, Tr. 896, 1106-07; Gaydos, Tr. 1195-96; Burriss, Tr. 1439; Knight, Tr. 2425) for use in the steel-making (Williams, Tr. 283-86; Lawrence, Tr. 701; Gaydos, Tr. 1198; Burriss, Tr. 1440-41), glass and copper industries. (Lawrence, Tr. 701; Garber, Tr. 897; Burriss, Tr. 1440-41; Knight, Tr. 2425-26.)

202. Both steel producing and refractories companies recognized that Lavino and Kaiser were competitors in 1973 in the sale of chemically bonded, regular burned and direct bonded bricks. (Sack Tr. 437; Garber, Tr. 896; Gaydos, Tr. 1195-96; CX 248.) [38]

Market Behavior

A. Barriers to Entry

TRADE COMMISSION DECISIONS

Initial Decision

93 F.T.C.

203. There have been no new entrants into the basic refractories market since 1964. (Williams, Tr. 185; Kappmeyer, Tr. 1336.)

204. In 1973, there were no potential entrants into the basic refractories market. (Williams, Tr. 186; Lawrence, Tr. 696; Garber, Tr. 898; Gaydos, Tr. 1203; Kappmeyer, Tr. 1337, 1404; Burriss, Tr. 1445.)

205. Steel companies are not perceived by manufacturers of basic refractories to be potential entrants into the production of basic refractories. (Williams, Tr. 189-90; Lawrence, Tr. 698; Garber, Tr. 898; Burriss, Tr. 1445; Caito, Tr. 1672-73, 1686-87.)

206. It would cost about \$50 million to \$60 million to build an efficient full-line basic refractories plant. (Garber, Tr. 901; Hegeman, Tr. 1710.)

207. The minimum amount of sales per year necessary to be profitable in the basic refractories market was about \$12 million in 1973. (Williams, Tr. 362.)

208. It takes three to five years to enter into the production of basic refractories. This amount of time is necessary in order to build a plant, to develop products, to supply the products to the R&D departments of the steel companies and for steel companies to test the products in production furnaces. (Rook, Tr. 577-78.)

209. An innovative R&D department is essential to the success of a basic refractories manufacturer. (Williams, Tr. 182, 322, 362; Lawrence, Tr. 719, 735; Hummer, Tr. 779; Garber, Tr. 902; Burriss, Tr. 1454.) Consistently high quality products are of major competitive importance in the basic refractories industry. In addition to quality control, constant upgrading of products is necessary. (Williams, Tr. 322, 338-39; Lawrence, Tr. 719-20; Van Dreser, Tr. 2677; CX 131.) A new entrant into the basic refractories market would have to have high quality R&D to be successful. (Lawrence, Tr. 697.) Kaiser's 1966-1977 Strategic Plan concluded that R&D "pre-investment costs are substantial and probably preclude new entrants into the industry." (CX 12T.) [39]

210. The R&D departments of major steel companies themselves test and evaluate basic refractory products. (Lawrence, Tr. 720; Gaydos, Tr. 1231; Kappmeyer, Tr. 1340-42, 1363-65.)

211. The R&D departments of the major steel companies formulate specifications regarding the quality of basic refractory products which must be met in order for the steel operators to be allowed to purchase a particular product. (Garber, Tr. 1142; Gaydos, Tr. 1231-32; Kappmeyer, Tr. 1340-42, 1363-65.)

212. Once a steel company's R&D department has approved a particular basic refractory product, the furnace operators select from

products on the approved list. (Gaydos, Tr. 1231-33; Kappmeyer, Tr. 1340-42; CX 110B; CX 256D-E.) The furnace operators develop loyalties to specific products and are reluctant to change to untried products. (CX 12Q.) As Kaiser recognized in their 1966-1977 Strategic Plan Outline: "This can be a barrier to entry of new refractories companies." (CX 12Q.)

B. History and Future of the Industry

213. The number of refractories producers in the United States declined from 179 in 1956 to 97 in 1976. (RX 10B; RX 27C.) This trend is primarily due to the shift from the use of nonbasic to basic refractories (CX 180Z24.) Smaller companies making nonbasic refractories were not equipped technologically or financially to develop the high performance refractories now demanded. (CX 181X.)

214. The increased quality and life of refractories products has meant fewer sales but higher cost and prices and increasing dollar sales by refractories producers. (Sack, Tr. 409-10; CX 180K, Z24, Z36; CX 181Q.) Because of increasingly severe processes, such as the growing use of AOD and electric furnaces, more basic refractories will be used in the future. (Sack, Tr. 411; CX 255.) [40]

215. Many plants producing nonbasic refractories have been abandoned rather than switched to the production of basic refractories. Most new plants have been built for basic brick production. (CX 181Y.)

216. In the early 1960's, most basic refractories producers were independent companies. A wave of mergers occurred and almost all major basic refractories manufacturers became subsidiaries or divisions of large corporations having annual sales of at least \$400 million. (Williams, Tr. 94; Sack, Tr. 371; Rook, Tr. 542; Garber, Tr. 857; Hegeman, Tr. 1690; CX 56N-P; CX 116B; CX 117C.) Of the top ten basic refractories manufacturers, only Basic, Inc., and General Refractories Company remain independent. (CX 117C.)

217. In 1968, Kaiser viewed these mergers as having a "positive influence" on profitability in the refractories industry (CX 13J) and as accelerating a trend toward "price firming as evidenced by Harbison-Walker leadership." (CX 13K.)

218. Kaiser and other refractories companies, as well as their primary customers, the steel companies, recognize that fewer refractories companies in the industry are likely to result in higher prices for basic refractory products. (CX 12P; CX 101B.)

219. Historically there has been little price competition in the basic refractories industry. At least as far back as the early 1930's

when the NRA (National Recovery Administration) existed, the practice in the basic refractories industry has been for one company to set prices and for all other industry members to follow these prices. (Williams, Tr. 190-91; Lawrence, Tr. 699; Garber, Tr. 918; Gaydos, Tr. 1201; Hall, Tr. 2313-14.)

220. Uniform prices are maintained in the basic refractories industry. (Mitsoff, Tr. 1773; Young, Tr. 1821; Smith, Tr. 2851.) The freight equalization method of pricing (*i.e.*, absorbing freight costs in selling prices to meet the price of more closely situated producers) is used in the industry. (Williams, Tr. 191; Garber, Tr. 1066-67.) Manufacturers of basic refractories publish price lists of their products (Williams, Tr. 190; Lawrence, Tr. 698-700; Garber, Tr. 1064) and very rarely fluctuate from those prices. (Gaydos, Tr. 1202; Smith, Tr. 2850.) [41]

221. Steel companies traditionally receive a "steel discount" amounting to 7 1/2 percent from their suppliers. Basic refractories manufacturers do not grant this discount to steel companies. (Williams, Tr. 192.)

222. Major basic refractories manufacturers which own their own source of supply of magnesia, supply their own needs and sell magnesia to smaller basic refractories manufacturers.¹³ The smaller manufacturers sometimes lose their source of raw materials when they attempt to compete with their supplier in the finished refractory. (Hegeman, Tr. 1699-1701.)

223. In 1977, NARCO acquired another basic refractories manufacturer, H. K. Porter Company. (Williams, Tr. 171, 361.) The president of NARCO testified that NARCO decisions on future acquisitions of basic refractories companies will depend on the outcome of this litigation. (Williams, Tr. 347-48.) Martin Marietta is also watching. (CX 213Z11-13.)

Anticompetitive Effects

A. Elimination of Actual Competition between Kaiser and Lavino

224. Prior to the acquisition, Kaiser and Lavino were in direct competition with one another in the manufacture and sale of basic refractories to the same consumers. (CX 19E-H.)

225. Lavino in 1973 manufactured and sold a full line of basic refractories including direct bonded brick, chemically bonded brick, regular burned brick, tar bonded brick, tar impregnated brick and basic specialties. Kaiser in 1973 also manufactured and sold a full

¹³ See Finding 157.

line of basic refractories including direct bonded brick, chemically bonded brick, regular burned brick, tar bonded brick, tar impregnated brick and basic specialties. (Burris, Tr. 1480; CX 95A-Z314; CX 116H; CX 204Z71-Z79, Z81-Z84.)

226. In fiscal year 1973, Lavino sold basic refractories to customers which also purchased basic refractories from Kaiser in calendar year 1973. These sales by Kaiser amounted to more than \$19 million and by Lavino amounted to more than \$17 million; in both cases this was over one-half of their total basic sales. (CX 38A-Q, *in camera*; CX 78A-S; CX 138D, F; CX 168H-I.) [42]

227. In fiscal year 1973, Lavino sold basic refractory bricks to nine out of Kaiser's top ten refractory customers for calendar 1973. The only such customer which did not purchase refractories from Lavino during its fiscal year 1973 was Electro Refractoraire, Kaiser's French affiliate. (CX 168K.)

228. In 1973 and before the acquisition, Kaiser and Lavino were significant competitors in the sale of basic refractory products to the steel industry, the cement industry, the copper industry and the glass industry for each of Kaiser's and Lavino's basic products. (Lawrence, Tr. 701; Burris, Tr. 1436-37; CX 19G-H; CX 64M-N; CX 110I; CX 111L, Z17; CX 115I; CX 116G; CX 117H-I, L; RX 495—Herbst 96, 116, 153-55.)

229. The major steel companies regarded Kaiser and Lavino as competitors for all types of basic brick and specialties in 1973. (Gaydos, Tr. 1195-1200; Kappmeyer, Tr. 1324-25; Mitsoff, Tr. 1735, 1741-42; Young, Tr. 1792, 1809; RX 495—Herbst 116, 153-55.) In that same year the major steel companies purchased basic refractory products from both Kaiser and Lavino for applications in open hearth, electric arc and basic oxygen furnaces. (Garber, Tr. 1106-08; Gaydos, Tr. 1197-99; Kappmeyer, Tr. 1324-25; CX 116G.)

230. Basic refractory producers viewed Kaiser and Lavino as competitors with each other and with themselves and other basic refractory producers in 1973 in the production and sale of tar impregnated basic brick, tar bonded basic brick, chemically bonded basic brick, regular burned basic brick, direct bonded basic brick and basic specialties. (CX 140A-L, *in camera*; CX 246C; CX 248A-B, *in camera*; CX 264; RX 495—Herbst 48-49, 96, 104, 120-21, 153-55; Williams, Tr. 169-71; Sack, Tr. 436-40; Rook, Tr. 548; Lawrence, Tr. 690-92; Hummer, Tr. 759-60, 765-66; Garber, Tr. 896-97, 1106-08; Burris, Tr. 1439-43; Caito, Tr. 1628-29; Knight, Tr. 2426-27.)

231. Lavino viewed itself as a competitor with Kaiser in 1973 and before in the production and sale of direct bonded basic brick, chemically bonded basic brick, regular burned basic brick, tar

bonded basic brick, tar impregnated basic brick and basic specialties. (Burriss, Tr. 1439-43; CX 116G-H; CX 136B; RX 495—Herbst 104.) [43]

232. In 1973 and before, Kaiser viewed Lavino as a competitor in all categories of basic refractories in all areas of the United States. (CX 13I; CX 19C-D; CX 26C; CX 28A; CX 50; CX 56N; CX 60B-D, H-O; CX 66M.)

233. Kaiser was aware of Lavino's prices for basic refractory products and, in at least one instance, lowered its own price to meet that of Lavino. (CX 28A.)

B. Structure of the Markets

1. Basic Refractories Market

234. Total sales of basic refractories in 1973 amounted to \$284 million. In 1973, Kaiser and Lavino were the second and fourth largest producers of basic refractories. Kaiser had \$33.8 million in production and sales in the market in 1973 which amounted to 11.9 percent. Lavino had \$26.4 million in production and sales which amounted to 9.3 percent. (CX 138A-F; CX 139A-X.)

235. Concentration in the basic refractories market was high in 1973 with the top firms having 33 percent, the top four firms having 53 percent and the top eight having 84 percent. (CX 138A-F; CX 139A-X.)

236. As a result of the acquisition, two firm concentration increased 9.3 percentage points, four firm concentration increased 9.1 percentage points and eight firm concentration increased 4.71 percentage points in the sale of basic refractories. In addition, the number four firm was eliminated. (CX 138A-F; CX 139A-X):

	<i>1973 Pre- Acquisition</i>	<i>1973 Post- Acquisition</i>	<i>Percent Increase</i>
Two firm	33.18	42.48	28.03
Four Firm	53.06	62.16	17.15
Eight Firm	83.80	88.51	5.62
Kaiser (rank)	11.87 (2)	21.18 (2)	78.43
Lavino (rank)	9.30 (4)	—	—

[44] 2. Basic Specialties Market

237. Total sales of basic refractory specialties were \$90 million in 1973. In that year Kaiser was the third largest domestic producer of basic specialties, having nearly 15 percent of that market with \$13.5 million in production and sales. Lavino was a substantial manufac-

turer of basic specialties with sales of \$2.85 million, having 3 percent of production and sales of basic specialties. (CX 138A-F; CX 139A-X.)

238. Concentration in the basic specialties market was high in 1973, with the top two firms having 37 percent of sales, the top four firms having 67 percent of sales and the top eight having 88 percent. (CX 138A-F; CX 139A-X.)

239. As a result of the acquisition, two firm concentration in the sale of basic refractory specialties increased by 2 percentage points while four firm and eight firm concentration each increased 3.13 percentage points. In addition, Kaiser became the number two firm, moving up from number three, and a substantial competitor in the market was eliminated. (CX 138A-F; CX 139A-X):

	<i>1973 Pre- Acquisition</i>	<i>1973 Post- Acquisition</i>	<i>Percent Increase</i>
Two Firm	37.49	39.50	5.36
Four Firm	67.01	70.14	4.67
Eight Firm	88.30	91.43	3.54
Kaiser (rank)	14.82 (3)	17.95 (2)	21.12
Lavino (rank)	3.13 (9)	—	—

[45] 3. Basic Refractory Bricks Market

240. Total sales of basic refractory bricks were \$194 million in 1973. In that year Lavino and Kaiser were the third and sixth largest producers of basic refractory bricks. Lavino had \$23.6 million of production and sales in the market in 1973 which amounted to 12.2 percent. Kaiser had \$20.3 million in production and sales which amounted to 10.5 percent. (CX 138A-F; CX 139A-X.)

241. Concentration was high in the basic refractory bricks market with the top two firms having 41 percent, the top four firms having 65 percent and the top eight firms having 94 percent of total sales of basic refractory bricks in 1973. Only 13 firms manufactured basic refractory bricks in 1973. (CX 138A-F; CX 139A-X.)

242. As a result of the acquisition, two firm concentration in the sale of basic refractory bricks increased by 9.6 percentage points, four firm concentration increased 10.5 percentage points and eight firm concentration increased by 2.39 percentage points. In addition, the number three firm was eliminated and Kaiser moved from being the number six firm to become the number two firm in that market. (CX 138A-F; CX 139A-X):

	<i>1973 Pre- Acquisition</i>	<i>1973 Post- Acquisition</i>	<i>Percent Increase</i>
Two Firm	41.35	50.92	23.14
Four Firm	64.68	75.18	16.23

	Initial Decision		93 F.T.C.
Eight Firm	94.29	96.68	2.53
Kaiser (rank)	10.49 (6)	22.70 (2)	116.40
Lavino (rank)	12.20 (3)	—	—

[46] 4. BOF Basic Bricks Market

243. Total sales of BOF basic bricks were \$45 million in 1973. In that year, Lavino and Kaiser were the fourth and sixth largest producers of BOF basic bricks. Lavino had \$3.6 million in production and sales in the market in 1973 amounting to 8 percent. Kaiser had \$1.75 million in production and sales which amounted to 4 percent. (CX 138A-F; CX 139A-X.)

244. Concentration was high in the BOF basic bricks market with the top four firms having 81 percent and the top eight firms having 98 percent of total sales in 1973. Only 9 firms manufactured BOF basic bricks in that year. (CX 138A-F; CX 139A-X.)

245. In the sale of BOF basic bricks, the acquisition caused four firm concentration to increase by 3.98 percentage points and eight firm concentration also to increase. The number four firm in the industry was eliminated and Kaiser became number four, moving up from number six. (CX 138A-F; CX 139A-X):

	1973 Pre- Aquisition	1973 Post- Aquisition	Percent Increase
Four Firm	81.46	85.44	4.89
Eight Firm	98.35	99.97	1.65
Kaiser (rank)	3.97 (6)	12.07 (4)	204.03
Lavino (rank)	8.09 (4)	—	—

[47] 5. Conventionally Bonded Basic Bricks Market

246. Total sales of conventionally bonded basic bricks were \$132 million in 1973. In that year, Lavino and Kaiser were the second and fourth largest producers of conventionally bonded basic bricks. Lavino had \$20 million of production and sales in the market in 1973, amounting to 15.17 percent. Kaiser had \$18.6 million in production and sales which amounted to 14.04 percent. (CX 138A-F; CX 139A-X.)

247. Concentration was high in the conventionally bonded basic bricks market with the top two firms having 46 percent, the top four firms having 76 percent and the top eight firms having 97 percent of total sales in 1973. Only 10 firms manufactured conventionally bonded basic bricks in that year. (CX 138A-F; CX 139A-X.)

248. As a result of the acquisition, two firm concentration in the sale of conventionally bonded basic bricks increased by 14 percentage points, four firm concentration increased by 9.27 percentage

points, and eight firm concentration also increased. In addition, the number two firm was eliminated and Kaiser moved from number four to number two. (CX 138A-F; CX 139A-X):

	<i>1973 Pre- Acquisition</i>	<i>1973 Post- Acquisition</i>	<i>Percent Increase</i>
Two Firm	46.44	60.48	30.23
Four Firm	75.57	84.84	12.27
Eight Firm	96.87	99.57	2.79
Kaiser (rank)	14.04 (4)	29.22 (2)	108.05
Lavino (rank)	15.17 (2)	—	—

[48] DISCUSSION

The following discussion summarizes and supplements the findings of fact and presents conclusions of law.

Introduction

Refractories are insulating materials used to control heat. A brick in a home fireplace is a refractory, as is the nose cone on a space vehicle. But the biggest use of refractories is to line furnaces and other equipment used in producing glass, cement, copper and steel.

The refractories industry classifies refractories as acid or basic, depending on the raw material used. To minimize wear, the chemical reaction of the refractory must be the same as the material being insulated. Thus, an acid refractory would not be used where it would contact the slag in a steel-making furnace, since that slag is chemically basic.

Refractories are also classified by their physical form as bricks and specialties. Refractory bricks may be rectangular or another shape such as a tapered wedge which is more useful for building a curved wall or the roof of a furnace. Refractory specialties may be grains the size of garden peas or children's marbles, or may be like putty. Refractory bricks are applied by bricklayers who build the industrial surface the way they would build a brick house with common bricks. Applying specialties is more like laying concrete, and the material may be cast, tamped or trowelled into place or blown through a pneumatic gun.

Refractories wear out from the high temperatures, chemical attack and buffeting they receive in use. Constant maintenance by adding additional refractories is necessary. One witness described what occurs when this is not done (Williams, Tr. 353):

They have what they term in the steel industry a "break out." A break out is where the refractory fails and the steel shell of these BOF vessels is about, depending on the size of

the vessel, 3 to 6 inches thick. But if this hot metal gets to the steel shell, it will burn a hole in the steel shell just like a melting torch and out squirts a thick stream of metal and that is a disaster.

[49] There is no substitute for refractories used to line industrial furnaces. For this reason, the refractory industry is highly important to the national economy.

Relevant Product Markets

This case involves an acquisition by respondent Kaiser of the refractories plants and assets of its competitor, the Lavino division of IMC. Both the Refractories Division of Kaiser and Lavino sold the same products to the same customers. They recognized each other as "major" competitors. (CX 56N; CX 111L.) After a careful study of Lavino, Kaiser's Refractories Division strongly recommended that the Lavino assets promptly be acquired, and one of the key elements for the proposed merger was that (CX 66M):

The same products, the same customers, the same applications, the same territories, are already an integral part of KaRef operations for the majority of the product lines. Much of the present operating expenses of Company "X" are spent in duplication of KaRef established efforts.¹⁴

Lavino also recognized that Kaiser was a company selling "products that compete functionally" with its own products for use in each of the uses for basic refractories. (CX 116G-H.)

To test whether an acquisition may substantially lessen competition, the area of effective competition must be determined by reference to product markets. *Brown Shoe Co. v. United States*, 370 U.S. 294, 324 (1962). The outer boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it. *Id.* at 325. Within the broad market, well-defined submarkets may exist which constitute product markets for antitrust purposes, and the boundaries of such submarkets may be determined by looking at, *id.* p. 325: [50]

industry or public recognition of the submarket as a separate economic entity, the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors.

Not all of these criteria must be met before a relevant submarket is found. Indeed, in *Brown Shoe* itself, the Court upheld the submark-

¹⁴ Company "X" was Lavino. (Adams, Tr. 2473.)

ets of men's, women's and children's shoes based only on public recognition, separate production plants, peculiar product characteristics and distinct customers. 370 U.S. at 326. And in *United States v. Aluminum Co. of America*, 377 U.S. 271 (1964), the Court observed that aluminum and copper electrical conductors perform the same job equally well. 377 U.S. at 276. Nevertheless, the Court found the two in separate submarkets, relying on only two factors: distinctive characteristics and prices. *Id.* at 276-77.¹⁵ The record in this case clearly establishes five "area[s] of effective competition," *United States v. Continental Can Co.*, 378 U.S. 441, 456 (1964), in which to test the competitive effects of this acquisition.¹⁶ [51]

Basic Refractories

Most refractories manufacturers make and sell both basic and nonbasic refractories and their trade association is for all refractories companies. (CX 204.) There are a few uses where certain basic and nonbasic refractories are interchangeable, such as in the roofs of electric arc steel-making furnaces. But in this wider market for refractories, submarkets exist which constitute product markets for antitrust purposes.¹⁷ Both supply and demand side analyses show that basic refractories products constitute such a product market.

Basic refractories have peculiar characteristics, different from nonbasic refractories, which make them uniquely capable of insulating steel-making furnaces where the molten slag would quickly destroy any other product. (Findings 16, 96, 112.) Both forms of basic refractories—bricks and specialties—are used interchangeably for this purpose. (Findings 97-99, 129.)¹⁸ The major basic refractories companies can produce all basic refractories products on the same

¹⁵ See also, *Abex Corp. v. FTC*, 420 F.2d 928, 931-32 (6th Cir.), cert. denied, 400 U.S. 865 (1970); see other cases cited in *Reichhold Chemicals, Inc.*, Dkt. 9076 [91 F.T.C. 246], Initial Decision by Law Judge Needelman, at pp. 62-63 of slip opinion (unreported), adopted by the Commission, 3 CCH Trade Reg. Rep. ¶ 21,412 (Feb. 22, 1978), appeal pending, Fourth Circuit Court of Appeals # 78-1275.

¹⁶ There is precedent in finding a relevant product market based on ingredients and a submarket based on use in the same case. In *United States v. Continental Can Co.*, 378 U.S. 441, 448, 457 (1964), the Supreme Court defined a market for the "combined glass and metal container industries and all end uses for which they compete," and did not reverse the finding of the district court that "containers for beer" was a submarket. Thus, it is permissible here to draw relevant product markets based on the outstanding characteristics of each market, i.e., basic refractories, basic bricks and basic specialties being named for their ingredients, BOF bricks being named for the use of the products, and conventionally bonded bricks being named by the construction of the products. Other relevant product markets based on the way the products are made include artificial Christmas trees, *United States v. American Technical Industries, Inc.*, 1974-1 Trade Cases ¶ 74,873 (M.D. Pa. 1974), and frozen pies, *United States v. Mrs. Smith's Pie Co.*, 440 F. Supp. 220 (E.D. Pa. 1976). But see, *Sterling Drug, Inc.*, 80 F.T.C. 477, 599 n.24 (1972).

¹⁷ Such submarkets may exist even though the broad market is not a product market for antitrust purposes. *Brown Shoe Company v. United States*, 370 U.S. at 299 (submarkets for men's, women's and children's shoes but not for all shoes); *Brunswick Corp.*, F.T.C. Dkt. 9028 (Initial Decision 5/2/77, at p. 66) (submarkets for high and low powered outboard motors but not for outboards).

¹⁸ That both basic bricks and basic specialties are separate relevant product markets does not stop the broader basic refractories market from being a product market for antitrust purposes. *United States v. Phillipsburg National Bank*, 399 U.S. 350, 360 (1970); *United States v. Continental Can Co.*, 378 U.S. 441 456-57 (1964).

facilities at some of their plants. (RPF 305; Finding 103.) Not all basic refractories plants can produce all basic refractories but all of the major producers, including Lavino and Kaiser, possessed the machinery to produce all types of basic refractories. Completely interchangeable production facilities are not necessary to find that products are in the same relevant market. *Liggett & Myers Inc.*, 87 F.T.C. 1074, 1158 (1976), *aff'd*, 567 F.2d 1273 (4th Cir. 1977). Basic refractories [52] and nonbasic refractories are not produced in the United States on the same production lines. (Findings 104, 105.)¹⁹ The major basic refractories producers sell both basic bricks and basic specialties. (Findings 100-03.)

Refractories producers themselves recognize basic refractories as an independent product market. (Findings 106-07.) And the technical knowledge for basic refractories is so distinct from nonbasic refractories that individuals specialize in developing, selling and buying basic refractories and do not deal in nonbasics. (Findings 110, 111, 113.)

Basic refractories are priced without regard to the prices of nonbasic refractories. (Findings 108, 109.) As a Lavino planning document stated, the use of basic refractories in the steel industry is required by the specifications of the steel companies and (CX 126D): "Other refractories products cannot meet these specifications so the cost of other products is not an important factor." Such supply side perceptions control the area of effective competition among products in the same market. *Reichhold Chemicals, Inc.*, *supra* at p. 60 of unreported slip opinion. And while it is true as argued by Kaiser that not all basic refractories are fungible, nonhomogeneous products have been held to constitute a line of commerce where, as here, there is resource flexibility or the sale of a full line by many firms. *United States v. Philadelphia National Bank*, 374 U.S. 321, 356 (1963); *Sterling Drug, Inc.*, 80 F.T.C. 477, 595 n.19 (1972) (*dicta*). [53]

Basic Specialties

Almost all basic specialties are used in the steel industry (Finding 115) in steel-making furnaces. (Finding 128.) Only basic specialties or basic bricks are used to line most steel-making furnaces. (Findings 16, 95, 112.) Basic specialties are the only product which can be used as a patching material for the basic refractories lining in those

¹⁹ There is some proof in the record that the German company, Didier, can make basic and nonbasic refractories in the same plant. (Mahler, Tr. 3007-09.) Even where production facilities are completely interchangeable, however, the better rule is to rely on that factor in considering the outer boundaries of a market but merely to look at it—with other factors—when drawing submarkets. Where products have different customers, end uses and inelastic prices, separate product markets should be formed regardless of the interchangeability of production facilities. *Budd Co.*, 86 F.T.C. 518, 567 n.1 (1975) (dissenting statement of Commissioner Dixon).

furnaces to avoid a "break out" (Findings 97, 99, 129) and may be sprayed on by a pneumatic gun while the furnace is still hot. (Finding 98.)

Basic specialties have industry recognition as a separate product line. (Findings 132, 133.) Basic specialties can be produced on some of the same equipment as basic bricks, but are not made on equipment used to make nonbasic specialties in the United States. (Findings 124, 126, 127.) Basic specialties have distinct customers—the steel industry. Specialized individuals (different from those who buy nonbasic refractories and from those who buy basic bricks) buy basic specialties for steel-making furnaces. (Findings 113, 130.) The price leader for basic specialties is different from the price leader for basic bricks and prices for basic specialties are set without taking account of prices for nonbasic products. (Finding 131.)

Basic Bricks

More than 80 percent of all basic bricks are sold to the steel industry for use in steel-making furnaces. (Finding 156.) Almost all of the brick refractories used in the steel-making furnaces in this country are basic. (Findings 95, 171, 172, 199.) Nonbasic refractories do not have the same characteristics and are not used for these same purposes. (Finding 143.) While basic specialties and basic bricks can be used interchangeably (Findings 97-99, 129), the products are usually used as complements (brick to build and specialties to patch), and not as substitutes. [54]

All major types of basic bricks (chemically bonded, regular burned, direct bonded, tar bonded and tar impregnated) can be made on the same production line of a well-equipped plant and major refractories manufacturers alternate production of the types of such bricks to meet demand. (Findings 150, 151, 154.) Nonbasic bricks are not usually produced at the same plant that produces basic refractories. (Finding 144.) Research and development is a critical aspect of producing basic bricks. (Findings 146-148.) R&D expertise in basic bricks production is not applicable to nonbasic refractories. (Findings 110, 141, 142.)

Prices for basic bricks are set without regard to the price of basic specialties and different refractories producers are the price leaders in each market. (Findings 131, 158; CX 56Q.) Basic bricks are recognized as a distinct product market by steel companies and by refractories manufacturers. (Finding 159.)

BOF Basic Bricks

Cross-elastic demand and interchangeable use show that BOF bricks are a relevant product market. BOF furnaces, which make most of the steel produced in this country, use only basic bricks bonded or impregnated with tar. (Findings 95, 171, 172.) Almost all basic bricks bonded or impregnated with tar were used in BOF's in 1973. (Finding 163.)

BOF bricks are recognized as a distinct product market by steel companies and refractories manufacturers. (Finding 176.) BOF bricks are priced without regard to the price of other basic or nonbasic bricks. (Finding 176.) "These preferences on the demand side and perceptions on the supply side combine to form an 'area of effective competition.' " *Reichhold Chemicals, Inc., supra*, at p. 64 of unreported slip opinion.

Conventionally Bonded Basic Bricks

The refractories industry, as far as this record shows, does not use the term "conventionally bonded basic brick." The industry does use the terms designated as the three main categories of that market: chemically bonded, regular burned, and direct bonded basic bricks (Finding 179) and recognizes this group of products as a distinct market. (Finding 200.) [55]

While rather cumbersome, the term "conventionally bonded basic bricks" does describe an area of effective competition where several refractories producers, including Lavino and Kaiser, were competing in 1973. These bricks vary substantially in price because of the different raw materials and methods by which they are made. (Findings 182-84.) But they all may be used in the same application. About half of the conventionally bonded basic bricks are sold to the steel industry where they are used in the linings of all steel-making furnaces except the BOF furnace. (Finding 192.) BOF bricks are not used interchangeably with conventionally bonded basic bricks (Finding 198), nor are nonbasic bricks. (Finding 199.) Conventionally bonded basic bricks are, however, used interchangeably with each other. Zoning practices depend on the characteristic degrees of cost and lining life of the three bricks, with chemically bonded being the least expensive and having the shortest life and direct bonded being the most expensive and durable. (Findings 183-85, 194.) Conventionally bonded basic bricks are also used in the production of cement, copper and glass, in the same parts of the kilns, furnaces and other equipment used to make those products. (Finding 193.)

Each of these types of bricks may be made on some production lines in a modern basic refractories plant. (Finding 186.) Shifting production of one type of conventionally bonded basic brick to

another requires a change in raw material and a change in the temperature at which the bricks are treated. (Finding 187.) This takes but a few hours. (Finding 188.) Nonbasic bricks are not produced on the same production line as conventionally bonded basic bricks. (Finding 191.)

Respondent argues that other products should be considered in any market including conventionally bonded basic brick. These other products, however, cannot be made on the same production facilities and are much more expensive than most conventionally bonded basic bricks, or for other reasons should not be included in the relevant product market. For example, respondents argue that isostatically pressed bricks must be included. These bricks, however, are not even now produced in commercial quantities. (Sack, Tr. 406-07, 515; Garber, Tr. 903.) Chromic oxide bricks account for an infinitesimal percentage of basic brick sales. (CX 138A-F; CX 139G, I, K.) Rebonded fused grain and fused cast bricks are so expensive and have such high economies of scale that they are unique products not generally competing with conventionally [56] bonded basic bricks. (RX 499F; CX 139C; Ackerman, Tr. 1861-63, 1873-74, 1925; Findings 195-97.) That some of these products may be used instead of conventionally bonded basic bricks does not interfere with the relevant market finding. Like the plastic, paper and foil which could be used instead of glass and cans for containers in *Continental Can*, other competing products do not necessarily negate the existence of the submarket found here. 378 U.S. at 457-58. See also *United States v. Connecticut National Bank*, 418 U.S. 656, 663 n.3 (1974).

Respondent argues that different types of conventionally bonded basic bricks are not used interchangeably because they are used in different parts of steel-making furnaces.²⁰ Lack of cross-elastic demand, however, does not prevent different products from being included in a line of commerce if other factors are present. *Liggett & Myers Inc.*, *supra*, at pp. 21,055-56 of Commission Opinion; *L. G. Balfour Co. v. FTC.* 442 F.2d 1, 10-11 (1972). Further, in *Sterling Drug, Inc.*, 80 F.T.C. 477, 593 (1972), the Commission pointed out that insofar as commonality of distribution is concerned, the important consideration is whether the products alleged to be in the same product market are sold through the same retail outlet—not where they are shelved within the store. Here, the important consideration is that all conventionally bonded basic bricks are used in steel furnaces (except BOF)—not where in the furnace present cost-benefit decisions place them.

²⁰ Zoning practices vary considerably from furnace to furnace in the steel industry. (Finding 30.)

Respondent stresses the differentiation of ingredients and characteristics of various refractories products, arguing that this prevents categorization for analysis of market effects. In *United States v. Continental Can Co.*, *supra*, the Court grouped glass and metal containers—from different industries—in the same relevant product market. Those products have much greater physical differences than products found in the conventionally bonded brick market. See 378 U.S. 441, 445 n.3 and 446 n.4. Differences in price and qualities of shoes also did not interfere with the product markets found in *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962). Here, because of industry recognition of the components of the market, common production facilities, distinct customers and vendors, and similar characteristics and uses, the three types of the conventionally bonded basic bricks constitute a relevant product market in which to test the effects of this acquisition. [57]

Geographic Market

The section of the country, for each of the product markets, in which to test the effects of this acquisition is clearly the United States. (Findings 86-93.) Respondent argues that one specialties product (dead burned dolomite) is sold regionally because of its low price and high transportation cost. But “the majority of products involved in this proceeding are distributed nationally and the major firms compete with others throughout the United States, a fact that compels finding that the nation as a whole constitutes the relevant market.” *Beatrice Foods Co.*, 86 F.T.C. 1, 60 (1975), *aff’d*, 540 F.2d 303 (7th Cir. 1976). Furthermore, that freight costs are a significant factor and give an advantage to a seller with a plant located close to the customer does not foreclose firms from selling nationwide. *Ibid.*

Kaiser and Lavino and the refractories industry view the whole nation as their marketplace. (Findings 90-93.) In the few states where Kaiser and Lavino did not make sales to steel companies there were almost no customers for basic refractories. (Williams, Tr. 168-69, CX 168H-I.) But they sold wherever they could. (Findings 89-91) The geographic market determination must be made on the basis of where the parties could make sales as well as where they have made sales. *United States v. Bethlehem Steel Corp.*, 168 F. Supp. 576, 598 (S.D.N.Y. 1958).

The commercial realities established in this record indicate that the geographic market for basic refractories, and for each of the other product markets found herein, is national. *Jim Walter Corp.*,

90 F.T.C. 671, 747-53 (1977), appeal filed, Fifth Circuit Court of Appeals No. 78-1669.²¹ [58]

Probable Effects on Competition

After determining the relevant markets, the next step is to ascertain whether the probable effects of the acquisition may be substantially to lessen competition in the markets. Statistics reflecting market shares and concentration are the primary index of this effect. *United States v. Philadelphia National Bank*, 374 U.S. 321, 362-66 (1963). And where concentration in a market is already great, an acquisition which results in even small increases of market share will be presumptively unlawful. *United States v. General Dynamics*, 415 U.S. 486, 497 (1974).

Each of the relevant markets found herein was highly concentrated before the acquisition. (Findings 235-36, 238-39, 241-42, 244-45, 247-48.) After the acquisition, Kaiser was number two with 21 percent in basic refractories; number two with 18 percent in basic specialties; number two with 23 percent in basic bricks; number four with 12 percent in BOF bricks; and number two with 29 percent in conventionally bonded basic bricks. (Findings 236, 239, 242, 245, 248.) All of these markets were highly concentrated after the acquisition, with resulting four firm concentration ratios well over 60 percent. Horizontal acquisitions involving smaller market shares and concentration ratios have been proscribed under Section 7.²² See cases collected in Commissioner Clanton's opinion in *Jim Walter Corp.*, *supra*, 90 F.T.C. at pp. 756-59; e.g., *Beatrice Foods, Co.*, 86 F.T.C. 1 (1975), *aff'd*, 540 F.2d 303, 307 n.5 (7th Cir. 1976) where the acquiring and acquired firms had 7.6 and 2.3 percent of the brush and roller market, with a four firm concentration ratio rising from 41.3 percent to 43.6 percent; and *Warner Lambert Co.*, 87 F.T.C. 812, 880 (1976) where the combining firms had 4.4 and 4.2 percent of a market and the four firm concentration ratio increased from 45 to 48 percent. Here, in BOF bricks, the market in which the smallest market share was affected, the firm with 4 percent acquired the firm with 8

²¹ Both exports and imports of basic refractories are relatively negligible and do not significantly change the analysis herein. (Williams, Tr. 358; CX 18225.) *United States v. Continental Can Co.*, 378 U.S. at 456-57. "[P]recision in detail is less important than the accuracy of the broad picture." *United States v. Brown Shoe Co., Inc.*, 370 U.S. 294, 342 n.69 (1962).

²² Respondent relies on the Antitrust Division's Merger Guidelines, 1 CCH Trade Reg. Rep. ¶ 4510 at p. 6884, arguing that the effect on the BOF brick market involved less than the proscribed percentage. The acquisition here just missed the guideline total of 14 percent. Moreover, "[t]hese Guidelines are merely a public statement of intended allocation of prosecutorial resources" *Fruehauf Corp.*, 3 CCH Trade Reg. Rep. ¶ 21,402 (Feb. 22, 1978) at p. 21,371, appeal pending, Second Circuit Court of Appeals No. 78-4053. See also, *Stanley Works v. FTC*, 469 F.2d 498, 504 n.13 (2d Cir. 1972), *cert. denied*, 412 U.S. 928 (1973).

percent and the four firm concentration ratio went from 81 percent to 85 percent. [59]

With the statistical evidence involving market shares and concentration in markets found in this case, a rebuttable presumption shifts to the acquiring company the burden of proceeding to show that the market share statistics give an inaccurate account of the acquisitions' probable effects on competition. *United States v. Citizens & Southern National Banks*, 422 U.S. 86, 120 (1975); *United States v. General Dynamics Corp.*, 415 U.S. at 497 (1974).

Respondent's arguments fail to meet that burden. In 1973, Kaiser wanted more high kiln capacity since it was selling all the direct bonded basic bricks it could make, and the acquisition of Lavino gave it needed BOF brick capacity and plants closer to the eastern steel market. (Findings 74, 75.) Respondent Kaiser argues that the acquisition was procompetitive because it put Kaiser in a stronger position to compete against Harbison-Walker, the leader in refractories. This argument has been rejected as a matter of law by the courts. *Ford Motor Co. v. United States*, 405 U.S. 562, 569-70 (1972); *United States v. Bethlehem Steel Corp.*, 168 F. Supp. 575, 615-18 (S.D.N.Y. 1958).²³

Respondent argues that only a minimal amount of money was involved in this direct competitive confrontation, and that in markets like BOF bricks neither Kaiser nor Lavino had been successful. But far smaller submarkets have been held substantial. *Seeburg Co. v. FTC*, 425 F.2d 124, 127 (6th Cir. 1970). And where two firms sell essentially the same product to the same types of customers, they are competing for Section 7 purposes, regardless of their success. *Id.* at 127-28; *American General Insurance Co.*, 89 F.T.C. 557, 630 (1977), appeal pending Ninth Circuit Court of Appeals No. 77-3207. Moreover, in the BOF market both Kaiser and Lavino were increasingly successful and were aggressively seeking new business. (Finding 178; CX 118N.) Therefore, their market share (Lavino at 8 percent and Kaiser at 4 percent) did not fully reflect the total impact on that market from the acquisition. *Cf. American General Insurance Co.*, 89 F.T.C. 557, 642 (1977). "Small but aggressive independents are the prototype of the firms Congress intended to preserve by enactment of Section 7." *Liggett & Myers, Inc.*, 87 F.T.C. 1074, 1181 (1976), *aff'd*, 567 F.2d 1273 (4th Cir. 1977). [60]

²³ Kaiser argues that the acquisition had procompetitive effects because Lavino allegedly was financially unstable. That argument is rejected, *infra* at p. 63. Respondent also points to the testimony of competitors that the acquisition has not lessened competition. The opinions of Kaiser's competitors on the merits of the acquisition carry little weight. This testimony was evaluated in light of their "potentially hospitable attitude toward increased concentration and their interest in making similar acquisitions on their own." *American General Insurance Co.*, 89 F.T.C. 557, 663 (1977). (See Findings 217, 218, 223.)

All of the markets involved in this case were concentrated. The *General Dynamics* case, *supra*, affirms the "importance of preventing even slight increases in concentration" in these markets. 415 U.S. at 497. Respondent argues that several professors of economics, including one of its witnesses, have the opinion that concentration is not an indication of oligopolistic behavior.²⁴ More important any such academic debate, however, is the dominant theme pervading congressional consideration of Section 7 which shows that the statute was meant by the legislators to stop the rising tide of concentration in the American economy. The Court stated in *Brown Shoe Co. v. United States*, 370 U.S. 294, 344 (1961) that it:

cannot fail to recognize Congress' desire to promote competition through the protection of viable, small, locally owned businesses. Congress appreciated that occasional higher costs and prices might result from the maintenance of fragmented industries and markets. It resolved these competing considerations in favor of decentralization.²⁵

The market shares and concentration ratios resulting from this acquisition show that little consideration need be given to "elaborate proof of market structure, market behavior or probable anticompetitive effects." *United States v. Philadelphia Nat'l. Bank*, 347 U.S. 321, 363 (1963). The record does contain evidence to show, however, that competition in the refractories industry will be lessened if this acquisition is allowed to stand. [61]

The basic refractories industry has very high barriers to entry including capital investment cost (Findings 206, 209), economies of scale (Finding 207), delay in entry time (Finding 208), and a technological barrier (Findings 209-12).²⁶ There have been no recent entrants and there were no potential entrants in 1973. (Findings 203-05.)

Historically there has been very little price competition in the basic refractories industry. (Findings 219-21.) This acquisition will decrease the chance of any price competition. (*E.g.*, Finding 223.) Before the Lavino acquisition, Kaiser viewed the merger trend in the refractories industry²⁷ as encouraging: "These mergers are viewed as a positive influence on industry ROA with anticipated emphasis on costs and prices." (CX 13J.) "Recent industry mergers will accelerate

²⁴ The traditional view of economists is well stated in F. Scherer, *Industrial Market Structure and Economic Performance*, (1971) at pp. 9, 13-19, 50, 183, 377, 466, 468.

²⁵ The acquisition also prevented the possibility of future deconcentration of the markets by Kaiser's internal expansion. Kaiser had the need and propensity. (Findings 43, 46, 47, 74, 75.) That loss is an unlawful effect in a horizontal merger case. *Stanley Works v. FTC*, 469 F.2d 498, 508 n.23 (2d Cir. 1972), *cert. denied*, 412 U.S. 928 (1973).

²⁶ High concentration may itself constitute a barrier to entry. *Fruehauf Corp.*, 3 CCH Trade Reg. Rep. ¶ 21,402 (February 22, 1978) at p. 21,366, appeal pending Second Circuit Court of Appeals No. 78-4053.

²⁷ Kaiser also has a history of growing in the refractories industry by acquisition. (Finding 41.)

price firming as evidenced by Harbison-Walker leadership." (CX 13K.)²⁸ In 1973, while Kaiser executives contemplated the acquisition of Lavino, they speculated that: "... [W]ith the anticipated reduction in the number of supplies, it is expected generally that the direct bonded pricing will strengthen rather than erode." (CX 101B.)²⁹ And, while Kaiser now argues that Lavino was financially weakened before the acquisition, the Kaiser Refractories Strategic Plan for 1973-82 asserted that price competition which occurred in the refractories industry was caused by just such "financially weaker companies exerting a downward force from published book prices." (CX 56Q.) [62]

The oligopolistic behavior of the basic refractories industry is also indicated by a Kaiser document which stated that its (CX 13Q):

Current R&D philosophy is not to interrupt a product life cycle by innovating its obsolescence. In some instances, the tendency is to react to competition rather than customer needs. . . . The cost of taking innovative leadership from Harbison-Walker is unknown and the benefits are questionable.

In this concentrated, oligopolistic industry, the effect of allowing the acquisition to stand would be to encourage even further concentration "by triggering other mergers by companies seeking the same competitive advantages sought by [Kaiser] in this case." *Unites States v. Continental Can Co.*, 378 U.S. 441, 464 (1964). Other basic refractories producers are watching this case, with the intent to merge if possible. (Finding 223.) For example, in August of 1975, Martin-Marietta, a leading basic specialties producer, saw the increased prices and profits in the production of basic direct bond and BOF bricks and studied the acquisition of a basic brick manufacturer. (CX 213Z11-Z13.) Their market plan advised against building new basic brick production facilities because (RX 474Z12): "This is time consuming and adds another brick supplier to share the market." Also, North American Refractory Company acquired the fifteenth largest basic refractories company in 1977 and is looking for additional mergers. (Finding 223.)³⁰

Before the acquisition, Kaiser and Lavino were direct, substantial competitors in each of the markets found herein. (Findings 114, 134, 178, 201, 224-33.) The acquisition eliminated that substantial competition. There is no doubt that this acquisition had anticompetitive effects on the markets for basic refractories products. [63]

General Dynamics

In *United States v. General Dynamics Corp.*, 415 U.S. 486 (1974), the Court looked at the history and probable future of the market and found no probable anticompetitive effects resulting from a horizontal merger of two companies mining coal. The Court found

²⁸ In basic bricks, Harbison-Walker "has either adopted or been delegated the role of pricing leadership." (CX 214C-D.)

²⁹ Kaiser's prediction was correct. Prices for basic direct bond and BOF bricks increased in 1974 from \$230 to

the "focus of competition" in the coal industry to be the procurement of long term supply contracts. The acquired company's coal reserves were almost totally committed and it had no possibility of acquiring more. 415 U.S. at 503. Since the acquired company could not compete in the future, the merger could not substantially lessen competition.

Relying on *General Dynamics*, respondent argues that Lavino was competitively weak prior to the acquisition and in the future would not have been a "viable competitive factor in the industry." In making this argument, respondent bears a heavy burden. *United States v. Amax, Inc.*, 402 F. Supp. 956, 970 n.53 (D. Conn. 1975). Respondent must show, as a matter of law, that Lavino "lacked the wherewithal to compete" in all of its markets. *Id.* at 970-71. Mere financial weakness (unless it amounted to a "failing company" defense) is not the test.³¹ The fact that it may not have been Lavino itself which would have continued competing in the future is irrelevant. *Id.* at 971. Unless respondent can prove that it was improbable that the Lavino basic refractories plants could have stayed in business, the defense must fail. Lavino's competitive weaknesses were not a defense. [64] "There is no such quasi-failing company defense available under Section 7 of the Clayton Act." *Reichhold Chemicals, Inc.*, *supra*, at p. 72 of slip opinion.³²

Even if such a defense existed, respondent's factual arguments have no merit. Respondent argues that, but for the acquisition, Lavino eventually would have been liquidated.³³ [65] This argument fails for lack of proof. Respondent's exhibit (RX 478) and witnesses offered to support this theory were unreliable, speculative and inconsistent.³⁴ Furthermore, where the acquired company was a division of a large profitable company like IMC, the financial records

³¹ Respondent did not raise the "failing company" defense which has been narrowly construed. *Citizen Publishing Co. v. United States*, 394 U.S. 131, 136-39 (1969). *Reichhold Chemicals, Inc.*, *supra*, pp. 71-72 n.92.

³² Other cases hold that *General Dynamics* calls for an assessment of the probable future health of the acquired company as if the acquisition had not occurred. *United States v. Consolidated Foods Corp.*, 1978-1 Trade Cases ¶ 62,063 (E.D. Pa. 1978), appeal filed July 10, 1978, allowed the defense where technological difficulties and limited product variety caused the acquired company's declining sales and "impaired its ability to compete in the future." *Id.* at p. 74,614 n.19.

In *Pillsbury Co.*, Dkt. 9091 [93 F.T.C. ———] (Initial Decision by Administrative Law Judge Joseph Dufresne, May 15, 1978), appeal pending, the defense was applied in an intensely competitive industry dominated by large firms and the acquired company was financially weak, had production problems, required capital, could not offer needed advertising assistance and other promotions, and had a debilitated division. *Id.* at p. 59.

United States v. International Harvester Co., 564 F.2d 769 (7th Cir. 1977), would extend the *General Dynamics* test to require the assessment of whether the "weakened" or "very precarious" financial condition of the acquired company would leave it "sufficient resources to compete effectively." This test, with its balancing of books, weighing of debt-equity ratios, allocations of costs, and "Z-scores" (Thorne, Tr. 3154-68), is highly speculative. "There is nothing, however, in *General Dynamics* which says that fluctuations in prices, costs, or profits are to be weighed routinely in Section 7 cases as countervailing factors which may distinguish the effects of a permanent structural change brought about by the acquisition." *Reichhold Chemicals, Inc.*, *supra*, slip opinion at 70-71.

³³ Even if the competitive health of Lavino at the time of the acquisition were relevant, respondent would have to show imminent competitive disability. An argument that Lavino might be liquidated eventually would amount to "uncabined speculation." *Cf. BOC International Ltd. v. FTC*, 557 F.2d 24, 28-30 (2d Cir. 1977).

³⁴ See citations to the record by complaint counsel in their reply brief pp. 4-8, 79-81.

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of the parent must be part of such a defense. *Farm Journal, Inc.*, 53 F.T.C. 26, 47-48 (1956); *Calnetics Corp. v. Volkswagen of America, Inc.*, 348 F. Supp. 606, 622 (C.D. Cal. 1972).³⁵

Respondent argues that Lavino's share of the basic refractories market had declined and that further decline was inevitable.³⁶ In fact, Lavino's market share from 1969 to 1973 was relatively stable. (RPF 410, *in camera*.) Its share of the dynamic BOF brick market doubled during that period and it was stepping up its marketing efforts and was increasingly successful. (Findings 68, 174, 178; RPF 397, *in camera*; Burriss, Tr. 1470.) And Kaiser knew that the market for Lavino's direct bonded bricks was growing. (Finding 74; CX 149D.) Lavino's dominance in direct bonded bricks and growing vigor in BOF bricks probably would have resulted in increased sales and profits. In August of 1975, [66] Martin-Marietta, a leader in the production of basic specialties but not a producer of basic bricks, saw growth potential in the production of basic direct bond and BOF bricks (RX 474Z11); "The price structure of Basic Direct Bonded and BOF Bricks increased three times last year from \$230 up to \$350 per ton average selling price. This significant price increase makes brick manufacturing far more attractive than in our previous studies."

Although at the time of acquisition Lavino was no longer integrated vertically into the production of magnesia, this was not necessarily a competitive disadvantage. Because of the oversupply of magnesia, some basic refractories producers prefer to shop for a supplier rather than produce their own material. (Williams, Tr. 174-75; Seelig, Tr. 2152-53.)

Kaiser argues that IMC's cutbacks on research and development weakened Lavino. However, at the time of the acquisition, Lavino's R&D had a reputation as one of the top in the industry. (Williams, Tr. 196; Hall, Tr. 2298-99.) And Kaiser must have thought Lavino's R&D staff was competent. After the acquisition, Kaiser replaced its own basic refractories R&D staff with the Lavino personnel. (Finding 82.)

Respondent also argues that IMC had withheld necessary capital from Lavino, putting it in a weakened position. While the record shows that IMC had a cost cutting policy (Findings 59, 60), and

³⁵ The books of a division can easily be adjusted by the parent, through allocations of debt, interest and other overhead costs, to make the division appear less profitable than it is. (Thorn, Tr. 3342-43; Rowe, Tr. 3902-03, 3980-90.) The accounting standards of the parent should not be used to determine whether its division is failing financially. Cf. *Reichhold Chemicals, Inc.*, *supra*, at pp. 72-73.

³⁶ This prediction is based in part on the assumption that Lavino was a narrow line, high cost producer. Lavino was, in fact, a broad line basic refractories producer. (Finding 225.) There are few advantages in producing both basic and nonbasic refractories. (Findings 104, 105, 113, 140.) Lavino's costs did not stop it from being profitable. (Finding 72.) And Kaiser knew those costs when it made the acquisition. (Findings 76, 79.)

Lavino's plants did have EPA and OSHA problems, and quality control and delivery problems at the time of the acquisition,³⁷ Lavino remained an effective competitor, accounting for a substantial share of each product market. (Findings 236, 239, 242, 245 and 248.)³⁸ There is no proof that Lavino's need for capital improvements at its plants was uncommon (Adams, Tr. 247) and these problems did not dissuade Kaiser from making the acquisition. Even with these expenditures, Kaiser planned that its profits from the Lavino plants would double its normal rate of return. (CX 66D.) [67]

REMEDY

This acquisition is "patently illegal and indefensible, and respondent must bend every effort" to restore Lavino as a viable competitor. *Reichhold Chemicals, Inc.*, *supra*, at p. 73; see also *Ford Motor Co. v. United States*, 405 U.S. 562, 572-78 (1972); *Ekco Products Co.*, 65 F.T.C. 1163, 1212-17 (1964), *aff'd*, 347 F.2d 745 (7th Cir. 1965). Only complete divestiture, including divestiture of after-acquired assets, can return Lavino to a position which assures another competitive force offering alternatives to buyers in the highly concentrated and oligopolistic basic refractories industry. *Fruehauf Corp., Inc.*, *supra*, 3 CCH Trade Cases at pp. 21,377-79; *Liggett & Myers, Inc.*, *supra*, Initial Decision, 87 F.T.C. at p. 1140; "In the absence of proof to the contrary the assumption of this Commission must be that 'only divestiture can reasonably be expected to restore competition and make the affected markets whole again.'" *Diamond Alkali Co.*, 72 F.T.C. 700, 742 (1967), quoting from *National Tea Co.*, 69 F.T.C. 226 (1966).³⁹

The order also prohibits Kaiser from acquiring another basic refractory producer for fifteen years without Federal Trade Commission approval. Kaiser has a history of acquiring basic refractories producers. The industry has had no recent entrants; has no potential entrants and high entry barriers; and is highly concentrated and subject to oligopolistic behavior. While not amounting to the monopolistic practices providing the basis for a twenty year prohibition, *Ekco Products Co.*, 65 F.T.C. 1163, 1217, 1228 n.3 (1964), *aff'd*

³⁷ Kaiser and other major refractories producers also had similar problems. (Mittsoff, Tr. 1776, 1779, *in camera*; Adams, Tr. 2471.)

³⁸ Lavino's efforts in the BOF market (Findings 174, 178), the loyalty it had developed for its products in the steel industry (Findings 212, 228) and its established distribution system, all implied future competitive strength which overcomes the *General Dynamics* defense. *American General Insurance Co.*, *supra*, 89 F.T.C. at 642.

³⁹ The order requires ancillary relief appropriate to correct the effects of anticompetitive practices engaged in by respondent. None of the provisions, however, involve novel and major relief such as that involved in *Liggett & Myers, Inc.*, *supra*, 87 F.T.C. at 1182, which might merit additional argument or evidence. Moreover, any comments by the parties on these provisions may be filed with the Commission which has the authority to issue a final order herein.

347 F.2d 745 (7th Cir. 1965), the facts here require a longer acquisition ban than in previous merger cases where a ten year ban was sufficient. *Jim Walter Corp.*, *supra*, 90 F.T.C. 671 (1977).

Respondent urges that only one of the plants should be divested, but with the relatively high economies of scale in this industry such a divestiture might not create a viable competitor. And, since the Gary plant and the Plymouth Meeting plant make different products, the new competitor will have a broad line, which will help it to compete against the major basic refractories producers. [68]

A spin-off of the divested entity might create an independent competitive force which the basic refractories industry certainly needs. There is the possibility, however, that the purchase of the Lavino business by a large company not previously in the basic refractories business would expedite its resuscitation. *Jim Walter Corp.*, *supra*, 90 F.T.C. at 765.

Respondent urges that it should not be required to sell the Lavino business at a price lower than its liquidation value. That is a matter which can best be determined after some effort is made to comply with this order. But in no event should the sale price allow respondent to profit from the possible appreciation in the value of the assets involved. *Reichhold Chemicals, Inc.*, *supra*, at pp. 73-74. The price should not exceed the amount paid by Kaiser plus the actual cost of subsequent improvements.

The order will require that any improvement in the Lavino business made by respondent since the acquisition shall be divested. The record shows that this occurred in part to meet government health and safety standards and for pollution control. This equipment should be included as part of the Lavino business to be divested. The Commission may properly require that the acquired firm be recreated in a form which will reflect the firm's probable growth, including improvements it may have added itself. *United States v. Aluminum Co. of America*, 247 F. Supp. 308, 316 (E.D. Mo. 1964), *aff'd mem.*, 382 U.S. 12 (1965) (order required divestiture of a plant built after unlawful acquisition); *Union Carbide Corp.*, *supra*, 59 F.T.C. at 657, 673 (divestiture of all of the post-acquisition improvements and equipment installed on premises of acquired company); see generally Elzinga, *The Antimerger Law: Pyrrhic Victories*, 12 *Journal of L. & Econ.* 43 (1969).

The order will provide the purchaser of the Lavino business with an assured source of supply of magnesia, the primary raw material for basic refractories. One of the most important assets acquired by Kaiser was Lavino's long term supply contract with Harbison-Walker for magnesia. Kaiser would not have made the acquisition

without that contract, and took advantage of the option to renew it. In an attempt to put the Lavino business back in the shape it would have been in but for the acquisition, the order will therefore provide that Kaiser (which has a magnesia supply for its own use) will supply equivalent grades, amounts and prices for the magnesia which will be needed by the purchaser of the Lavino business to penetrate the market again. See *United States v. Kennecott Copper Corp.*, 249 F. Supp. 154, 162 (S.D.N.Y.), *aff'd mem.*, 381 U.S. 414 (1965); *cf. Ford Motor Co. v. United States*, *supra*, 405 U.S. at 572. [69]

The order will also require Kaiser to supply to the purchaser know-how developed by Lavino and by the Lavino research and development personnel who now staff Kaiser's basic refractories R&D division. *Reichhold Chemicals, Inc.*, *supra*, at p. 75. The Order does not punish Kaiser by requiring it to turn over know-how which it developed on its own prior to the acquisition.

The order also requires Kaiser to help put the Lavino business in a position where it can sell what it makes. After the acquisition, Kaiser fired most of the Lavino sales personnel. The order therefore requires Kaiser to help find and train sales personnel, to provide them with customer lists, and to cease soliciting, for a time, the customers obtained from Lavino. Since both Lavino and Kaiser sold to some of the same customers prior to the acquisition, the order applies only to the customers who bought from Lavino and not from Kaiser.⁴⁰ These provisions are designed " 'to give the divested [company] an opportunity to establish its competitive position' and the time it needs to 'obtain a foothold in the industry.' " *Reichhold Chemicals, Inc.*, *supra*, at 75, quoting *Ford Motor Co. v. United States*, 405 U.S. at 575. [70]

CONCLUSIONS OF LAW

1. The Federal Trade Commission has jurisdiction over the subject matter of this proceeding and over respondent Kaiser.
2. On February 28, 1974, Kaiser acquired two basic refractory plants and related assets from International Minerals & Chemical Corporation (IMC). These assets were part of the Lavino Division of IMC.
3. At all times relevant to this proceeding Kaiser and IMC and Lavino were engaged in commerce within the meaning of the Clayton Act and the Federal Trade Commission Act.

⁴⁰ The term "customer facility," rather than "customer," is used in the order. The decision as to which basic refractories company to buy from is made at each plant. (Findings 113, 178; CX 114H) For example, both Kaiser and Lavino sold BOF products in 1971 to the Wheeling-Pittsburgh Steel Corp. plant in Monessen, Pennsylvania. But at that steel producer's Steubenville, Pennsylvania, plant, Lavino was a supplier and Kaiser was not. The order would therefore prohibit Kaiser from soliciting the Steubenville plant.

4. For the purpose of assessing the legality of the acquisition the relevant lines of commerce are the manufacture and sale of: (i) basic refractories; (ii) basic refractory specialties; (iii) basic refractory bricks; (iv) basic oxygen furnace bricks; and (v) conventionally bonded basic bricks.

5. The United States as a whole is an appropriate section of the country within which to test the effects of the acquisition.

6. Prior to, and at the time of the acquisition, Kaiser and IMC's Lavino Division were actual competitors in the United States in each line of commerce set out in Conclusion #4.

7. The acquisition eliminated substantial actual competition between Kaiser and IMC's Lavino Division and between IMC's Lavino Division and other firms in each line of commerce set out in Conclusion #4.

8. The acquisition substantially increased concentration and decreased the possibility of deconcentration in each line of commerce set out in Conclusion #4.

9. Additional acquisitions and mergers in each line of commerce set out in Conclusion #4 may be encouraged if this acquisition were permitted.

10. The acquisition raised the already high entry barriers in each line of commerce set out in Conclusion #4.

11. The acquisition strengthened the position of Kaiser in each line of commerce set out in Conclusion #4. [71]

12. The effect of the acquisition of Lavino by Kaiser may be substantially to lessen competition in each line of commerce set out in Conclusion #4 in the United States, in violation of Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act.⁴¹

13. Divestiture, including all improvements and all after acquired property, is both necessary and appropriate to remedy the anticompetitive effects of this unlawful acquisition. In addition, Kaiser should be required to provide technical assistance, marketing assistance and raw materials to the purchaser of the divested Lavino assets. Finally, Kaiser should be prohibited from acquiring any basic refractory producer, without prior approval of the Federal Trade Commission, for a period of fifteen (15) years. [72]

ORDER

I

It is ordered That:

⁴¹ No separate proof or arguments were made under the Section 5 count but any violation of Section 7 is a violation of Section 5. *FTC v. Brown Shoe Co.*, 384 U.S. 316, 321-22 (1966).

Respondent Kaiser Aluminum and Chemical Corporation (hereinafter "Kaiser"), a corporation, and its officers, directors, agents, representatives, employees, subsidiaries, affiliates, successors, and assigns, shall divest all assets, title, properties, interests, rights and privileges of whatever nature, tangible, and intangible, including without limitation all real property, buildings, machinery, equipment, tools, raw materials reserves, inventory, customer lists, trade names, patents, trademarks and other property of whatever description acquired by Kaiser as a result of its acquisition of the basic refractories segment of the Lavino Division of International Minerals and Chemical Corporation (hereinafter "Lavino" and "IMC") together with all additions and improvements to said property which have been made subsequent to the acquisition. Such divestiture shall be absolute, shall be accomplished no later than one year from the effective date of this order, and shall be subject to the prior approval of the Federal Trade Commission. [73]

II

Within 20 days of the effective date of this order, pending divestiture, the property and business specified in Paragraph I shall be maintained and operated as a separate corporation with separate books and accounts, separate management, separate assets, and separate personnel.

III

Pending divestiture, no substantial property or other assets of the separate corporation referred to in Paragraph II herein shall be sold, leased, otherwise disposed of or encumbered, other than in the normal course of business, without the consent of the Federal Trade Commission, and Kaiser shall not commingle any assets owned or controlled by such separate corporation with any assets owned or controlled by Kaiser.

IV

For the period of three years from the date on which this order becomes final, no individual employed by the separate corporation referred to in Paragraph II herein shall be hired by Kaiser. [74]

V

Pending divestiture, Kaiser shall maintain the separate corporation referred to in Paragraph II herein as an independent entity and

take no steps to impair such corporation's economic and financial position.

VI

Pending any divestiture required by this order, Kaiser shall not allow the deterioration of the property specified in Paragraph I in a manner that impairs the marketability of the business.

VII

Pursuant to the requirements of Paragraph I, none of the property or business acquired or added by Kaiser shall be divested to anyone who is an officer, director, employee or agent of Kaiser or is in any other way controlled or influenced by Kaiser, or to anyone who owns or controls, directly or indirectly, more than one percent of the outstanding shares of the capital stock of Kaiser or to anyone who is not approved in advance by the Federal Trade Commission. [75]

VIII

For a period of fifteen years from the date this order becomes final, Kaiser shall cease and desist from acquiring or acquiring and holding directly or indirectly, through subsidiaries or otherwise, without the prior approval of the Federal Trade Commission, the whole or any part of the stock, share capital or assets, or any other interest in any company engaged in the business of manufacturing, distributing, or selling basic refractories.

IX

For a period of five years from the date of the divestiture specified in Paragraph I, Kaiser shall provide upon request of the purchaser, without charge, the use of all know-how, patents, and trade secrets developed by the Kaiser Refractories Division basic refractories research and development staff since the acquisition by Kaiser of the Lavino assets.

X

For a period of three years from the date of the divestiture described in Paragraph I, if requested by the purchaser for its own use, Kaiser shall provide such amounts and grades of magnesia as are requested, with the maximum amounts, grades and prices to the purchaser limited to that received by Kaiser under the supply contract (or any renewal pursuant thereto) obtained by Kaiser from

Harbison-Walker in the acquisition [76] of the Lavino assets. Kaiser shall provide the purchaser reasonable access to documents sufficient to allow the purchaser to determine whether Kaiser is in compliance with the provisions of this paragraph.

XI

For a period of one year from the date of the divestiture described in Paragraph I, Kaiser shall, if requested by the purchaser, without charge, in good faith, assist the purchaser in hiring and training a staff for research and development and for sales of basic refractories. Kaiser shall, in this regard, pay the expense of obtaining, through an employment agency picked by the purchaser, competent, technically trained, basic refractories salesmen and research and development scientists, and their supervisors. The number of such personnel shall not exceed the number employed by Lavino on November 9, 1973.

XII

At the time of the divestiture required by this order, Kaiser shall make available to the purchaser of the property and business, a list of all of Kaiser's customers for basic refractories products who have purchased said products from respondent within three years prior to the divestiture. [77]

XIII

For a period of two years from the date of the divestiture described in Paragraph I, Kaiser shall not solicit, for the purpose of selling basic refractories products, any customer facility which purchased said products from Lavino, and not from Kaiser, during the year prior to the acquisition.

XIV

Any dispute arising under Paragraph IX through XIII of this order shall be resolved at the option of either Kaiser or the purchaser pursuant to the Commercial Arbitration Rules and the procedures of the American Arbitration Association. If arbitration is invoked by either party, such arbitration shall be exclusive and in lieu of any other common law rights. The arbitrator shall be selected by the parties from the panel of arbitrators of the American Arbitration Association or by the Federal Trade Commission in the event that the parties are unable to agree; said arbitrator shall be empowered to determine the merits of any dispute arising under Paragraphs IX through XIII of this order, and assess the costs of arbitration; the

decision of said arbitrator shall be final and binding upon the parties and judgment thereon may be entered in any court of competent jurisdiction. Arbitration shall be no cause for delay; and in the event of a default by either party in appearing before the arbitrator, pursuant to advance written notice, the arbitrator is authorized to render a decision upon the testimony of the party appearing. [78]

XV

One year from the effective date of this order, and on the anniversary date of each year thereafter until the expiration of the prohibitions in Paragraph VIII of this order, Kaiser shall submit a report in writing to the Federal Trade Commission listing all acquisitions, mergers and agreements to acquire or merge made by Kaiser relating in any way to the production or sale of basic refractories; the date of each such acquisition, merger or agreement; the products involved and such additional information as may from time to time be required.

XVI

Within thirty days from the effective date of this order and every sixty days thereafter until it has fully complied with Paragraph I of this order, Kaiser shall submit a verified report in writing to the Federal Trade Commission setting forth in detail the manner and form in which it intends to comply, is complying or has complied therewith. All such reports shall include in addition to such other information and documentation as may hereafter be requested: (a) a specification of the steps taken by Kaiser to make public its desire to divest Lavino, (b) a list of all persons or organizations to whom notice of divestiture has been given, (c) a summary of all discussions and negotiations together with the identity and address of all interested persons or organizations, and (d) copies of all reports, internal memoranda, [79] offers, counteroffers, communications and correspondence concerning said divestiture.

XVII

Kaiser shall notify the Commission at least thirty days prior to any proposed changes by it which may affect compliance obligations arising out of this order.

OPINION OF THE COMMISSION

By DIXON, *Commissioner*:

On February 28, 1974, respondent Kaiser Aluminum & Chemical Corporation acquired two refractory plants and the related assets of the Lavino Division of International Minerals & Chemical Corporation. Complaint issued on April 27, 1976, charging that the acquisition violated Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act.

Both Kaiser, a diversified company doing business internationally and one of the United States' largest corporations, and Lavino were, at the time of the acquisition, engaged in the manufacture and sale of refractories throughout the United States. The complaint alleged that in the five relevant product markets¹ the acquisition eliminated substantial competition between Kaiser and Lavino, increased already high levels of concentration, raised barriers to entry, will increase concentration by precipitating additional acquisitions, and strengthened Kaiser's competitive position. [2]

Hearings were held before Administrative Law Judge James Timony, who filed an initial decision on October 13, 1978, concluding that the acquisition violated Section 7 of the Clayton Act and Section 5 of the Federal Trade Commission Act and recommending an order requiring Kaiser to divest the Lavino assets. The ALJ's holding that the acquisition was illegal was based principally upon the findings that there were, as alleged, five relevant product markets; that in each concentration was high (among the top four firms, it ranged from 62.16% to 85.44%); and that concentration increased significantly in each of the markets as a consequence of the acquisition (among the top four firms from 3.13% to 10.5%). The matter is before the Commission on the appeal of respondent from the initial decision.

A. The Products

Refractories are materials that line furnaces and reactors and are designed to withstand the intense heat necessary to "smelt ores, refine materials, generate steam power and to produce glass, Portland cement, pottery and building brick". (CX 178 "O")²

All refractories have in common the capacity "to allow a useful or desirable process or event to be controlled at temperatures above a dull red heat". (CX 232J) More specifically, refractories must remain

¹ On September 8, 1976, the complaint was amended, adding two product markets to the original three.

² The following abbreviation are used herein:

I.D.	- Initial Decision
I.D. p.	- Initial Decision, Page No.
CX	- Complaint Counsel's Exhibit No.
RX	- Respondent's Exhibit No.
Tr.	- Transcript of Testimony, Page No.
RAB	- Respondent's Appeal Brief

stable at high temperatures and must withstand pressures from the weight of the furnace parts or contents, the thermal shock resulting from rapid heating or cooling, other stresses induced by temperature change, mechanical wear resulting from movement of furnace contents and chemical attack by heated solids, liquids, gases or fumes. (CX 232J) [3]

Refractories are classified by (a) their composition, (b) shape, (c) the method by which their mechanical strength is imparted, and (d) their resistance to chemical attacks.

Refractory Composition

The raw materials used to construct refractories are magnesia, chrome ore, dolomite, fire clay, silica and alumina.

Refractory Shapes

Refractories are generally pre-formed, most commonly into a 9" x 4-1/2" x 2-1/2" shape. To meet special needs, some refractories are pre-formed in such shapes as arches or wedges. All pre-formed refractories are referred to as "bricks." Refractories that are unformed are referred to as "specialties" and include ramming and casting mixes, cements and mortars, and furnace grains. (CX 95Z-91)

Imparting Strength

Refractory bricks obtain their strength through exposure to fire, chemicals or tar. A brick subjected to a relatively low temperature fire is known as a "regular burned brick," while one subjected to a higher temperature fire is a "direct bonded brick." When a brick is bonded by chemicals such as epsom salts, the industry calls it a "chemically bonded brick." When tar is added to the brick during mixing, it is known as a "tar bonded brick." A brick saturated with tar after it is fired is called a "tar impregnated brick." (CX 95Z-85; CX 111G-H)

Resistance to Chemical Attack

Refractories are either basic or non-basic depending upon their capacity to resist chemical or acid erosion. As expressed by Kaiser in its "Handbook of Refractory Products" (CX 95Z-73), "Chemically speaking, refractories may be divided into two major groups—acid and basic. Basic refractories, alkaline [unacid] in nature, are made from . . . magnesia, and chrome ore" and, as such, resist chemical emissions. In direct contrast, non-basic refractories are designed to withstand acid emissions. [4]

It should by now be evident to the bewildered reader that because a refractory may be made of one or more of six raw materials and because the proportion of the raw material or raw materials will give it distinct performance characteristics as will the method of bonding and its shape, a wide variety of refractories are produced. By combining different bonding processes and raw material mixes, the industry produces, for example, direct bonded magnesia/chrome bricks, tar bonded carbon/magnesia bricks, tar-impregnated magnesia bricks, tar bonded magnesia bricks, chemically bonded chrome/magnesia bricks, regular burned magnesia/chrome bricks, and direct bonded magnesia/chrome bricks.

Uses of Refractories

In a typical furnace or reactor, a wide variety of refractories may be deployed, since the demands placed upon the refractory vary with its location in the furnace. By way of illustration, in a publication entitled *Refractories for the Direct-Arc Electric Furnace Basic Slag Practice* (CX 254), the refractory manufacturer, A.P. Green, discusses refractory needs in each section of the electric arc furnace. As an example, A.P. Green examines the requirements in the furnace's subhearth and lower side walls, noting that refractories placed there must be capable of containing molten steel. A magnesia refractory brick is recommended because it is "an excellent contact material for this use, since it has a very high melting point . . . and goes into solution in lime rich slags very slowly . . . A burned, high purity hydration resistant magnesia brick . . . is normally recommended for this area To lower the initial cost, some operators prefer magnesite brick . . . , chrome-magnesite brick . . . , or even fire claybrick beneath a top layer of burned magnesia brick. Since subhearth are generally not replaced for many furnace campaigns, the economy of compromising on quality in this area is questionable." (CX 254F)

The company, in examining that portion of the electric arc furnace called "the working hearth," notes that the use of fire clay bricks (a non-basic refractory) makes for rapid erosion. So instead, "the bottoms of most basic . . . electric arc furnaces are constructed of a high purity of magnesia ramming mix . . . Burned magnesia brick . . . bottoms are used from time to time with excellent success. Some use is also being made of vibrated high purity dolomite." (CX 254"O") [5]

At the slag line, A.P. Green goes on to point out, a high purity burned magnesia brick has historically been recommended. "Some 15 years ago fused basic brick . . . became available, and these

products do an excellent job of resisting chemical solution. However, they are expensive, costing several times as much as [high purity magnesia brick], and they are difficult to patch because nothing will fuse to them. More recently three new types of brick have further application in slag lines: direct bonded magnesia-chrome rebonded fused grain brick; and high fired burned magnesia impregnated with pitch" Of these, the magnesia-chrome brick and the fused grain brick were more tolerant of slags that "move over onto the acid side at times", while the magnesia impregnated with pitch brick was "superior to these in resistance to chemical solution in strongly basic slags high in lime and iron oxide. The pitch impregnation . . . gives it superior resistance to slag penetration." (CX 254W)

B. The Companies

Kaiser, a Delaware corporation, is a fully integrated aluminum producer engaged in the production of agricultural chemicals, industrial chemicals and refractory materials. With revenues in 1973 totalling \$1.28 billion, *Fortune* magazine ranked it as the 133rd largest corporation and with assets of \$1.81 billion, as the 67th largest firm. Its net income in 1973, before extraordinary items, was \$44.54 million. Kaiser, which supplies refractories to producers of iron and steel, glass, cement, petroleum, chemicals and copper, entered the refractory business in 1943 with the opening of a plant at Milpitas, California. In later years it added refractory plants at Natividad and Moss Landing, California. To expand its sales to major steel producers, Kaiser constructed in 1956 a basic refractories plant at Columbiana, Ohio. The company first installed high temperature kilns at its Moss Landing facility in the mid 1960's and to accommodate unusual demand for direct bonded bricks, constructed an additional kiln in 1973. By the late 1960's Kaiser was producing BOF (basic oxygen furnace) bricks in its Columbiana plant. Sales of tar bonded bricks reached \$1.6 million in 1973. Up to the time of the challenged acquisition, Kaiser operated its refractory business at a profit. [6]

Lavino, which was founded in 1887, first produced basic refractories after World War I at a plant in Plymouth Meeting, Pennsylvania. In the early 1950's, a facility for the construction of refractories was built at Newark, California. A plant producing raw materials was established at Freeport, Texas, in 1960. In that same year, a basic refractory plant was constructed at Gary, Indiana, for the purpose of supplying steel producers. The company added a tar

bonding facility to its Gary plant in 1963 when it entered the BOF refractories business.

Lavino was responsible for a number of innovations in the refractories industry. In 1962, it produced the first direct bonded basic refractory brick. In earlier years, it was first to produce plastic chrome ore and fosterite bonded chrome/magnesia brick, and to use chrome ore supplied from a variety of different countries. In 1966, Lavino was purchased by International Minerals & Chemicals Corporation (IMC) for approximately \$26 million. IMC is a highly-diversified, industrial corporation, which in 1973 showed total sales of \$555.86 million; net earnings before income taxes and extraordinary items of \$36.14 million, and total assets of \$259.89 million. In January, 1971, IMC initiated several changes in the Lavino operation, transferring officers and employees, making public its desire to sell the company, limiting expenditures to the maintenance of the daily operation of the business, and closing Lavino's Newark plant. A year later, in 1972, Lavino's Freeport magnesia plant and its Newark production facility were closed. While expenditures in research and development were cut from \$636,000 in fiscal 1971 to \$532,000 in 1972 and then to \$404,000 in the fiscal year 1973, Lavino did not reduce its professional R&D staff. The cutbacks were achieved by reducing expenditures in other areas, including new testing equipment. Lavino's earnings in 1968-69 were \$3,433,000; in 1969-70, \$2,873,000; in 1970-71, \$17,000; in 1972-73, \$2,380,000; and in the first half of 1973-74, \$1,779,000. During fiscal year 1971-72, when steel production dipped sharply, Lavino realized a loss of \$340,000.

C. Relevant Markets

The administrative law judge found that the "section of the country" or geographic market in which the merging parties competed was the United States as a whole, a finding that neither side contests and one that is clearly established by the record. Respondent, however, objects strenuously to the ALJ's determination of relevant product markets. [7]

The Overall Market: Basic Refractories

In considering whether a diverse number of products such as those that comprise the basic refractory market constitute a relevant line of commerce, we must not include an "infinite range" of products, *Times-Picayune v. United States*, 345 U.S. 594, 612 n.31 (1953), nor insist that the products "be fungible," *United States v. duPont*, 351 U.S. 377, 394 (1956). As the Court admonished in *United States v.*

Continental Can Co., 378 U.S. 441 (1964), it is necessary to look between these two extremes and "recognize meaningful competition where it is found to exist." 378 U.S. at 449. Guideposts to the recognition of markets, such as the reasonable interchangeability of end use of the various products, cross-elasticity of production facilities and the *Brown Shoe*³ criteria for submarkets may be discerned only by "a careful consideration based upon the entire record."⁴ We have examined the record with particular emphasis on two factors: interchangeability of end use and cross-elasticity of production.

Interchangeability of End Use

At least 80% of basic refractory production is used in steelmaking, and thus patterns of refractory use in steelmaking are most relevant in determining the degree of interchangeability among various refractories. In each of the steelmaking furnaces, open hearth, electric arc, argon oxygen decarburization⁵ and basic oxygen, the type of refractory (its shape, its bond and the raw material) to be deployed in a given location is determined by a practice known as "zoning". Each furnace is divided into wear areas or zones. Refractories of the highest quality are used in the highest wear areas, those of the lowest quality in the lowest wear areas. In this way wear should ultimately be the same throughout the furnace so that no one area of the furnace will wear out before the others, and when the furnace is shut down, all areas will require replacement of refractories. As one witness explained the goal of zoning, it is a method that means "you don't have six inches of lining in one place down to nothing in the other." (Tr. 886-87) [8]

Arranged from the lowest to the highest quality basic bricks in terms of wear are chemically bonded (used in open hearth, electric arc and argon oxygen decarburization furnaces), regular burned (open hearth, AOD, electric arc), direct bonded (open hearth, electric arc, AOD), tar bonded (basic oxygen) and tar impregnated (basic oxygen).

With the exception of tar bonded and tar impregnated refractories, the open hearth, electric arc and AOD furnaces can generally utilize any of the other basic refractories. The basic oxygen furnace uses almost exclusively tar bonded or tar impregnated refractories and these refractories have virtually no application outside the basic oxygen furnace.

³ *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962).

⁴ *United States v. Continental Can Co.*, 378 U.S. 441, 449 (1964).

⁵ This furnace, referred to as AOD, is used to further refine steel produced in the electric arc furnace. (Tr. 1313)

The placement of bricks in a furnace appears to be as much an art as it is a science. Furnaces of identical design will utilize different bricks in the same zone and even the type of refractory used in a given zone of a given furnace will change from shutdown to shutdown. Among the factors that affect wear, and hence affect the type of refractory to be used, are the formula used to make the various qualities of steel (Tr. 1281), steelmaking practices (Tr. 125-26), size of the ingot to be manufactured (Tr. 1189), the source of scrap steel (Tr. 1121) and the level of steel production. (Tr. 1877)

Performance characteristics of refractories are affected by the raw material comprising the brick or specialty. Specifically, the quality, the ratio (e.g., magnesite to chrome) and the type of raw material all affect performance. Still, refractories comprised of different raw material may be substitutes for each other. As an example, A.P. Green recommends the use of magnesia brick in the subhearth of an electric arc furnace, but the firm also recognizes that a cheaper chrome/magnesite brick would be suitable. (CX 245F)

As to the substitution of specialties for bricks and the reverse, specialties, like bricks, are comprised of chrome, magnesia or dolomite, and are used by the steel industry in the open hearth, electric arc and basic oxygen steelmaking furnaces. The Kaiser refractory handbook (CX 95Z-91) describes specialties "as companion products used in connection with—and sometimes instead of—basic brick." Specialties may be used as "initial lining materials and as maintenance materials to maximize furnace lining life" to reduce the frequency with which the furnaces must be relined. (CX 95Z-91) In lining each type of steelmaking [9] furnace, bricks and specialties are directly substituted for one another: Tr. 576 (open hearth furnaces); Tr. 577, 760 (basic oxygen furnaces), and Tr. 396, CX 254"O" (electric arc furnaces). Among furnaces, then, the ratio of brick to specialties will vary. To illustrate, in a basic oxygen furnace from 2-1/2 lbs. to 5 lbs. of brick will be used per ingot ton of steel produced. As the poundage of bricks increases, there is a proportionate decrease in the amount of specialties, and *vice versa*. (Tr. 417)

Because there are numerous differing performance demands upon basic refractories and because almost every refractory type will meet some particular demand better than any other refractory, there is not *perfect* interchangeability and in some limited cases none at all among basic refractories. However, where substitution is not recommended or possible, other factors, such as production flexibility, may link the products.

The strongest argument against including all basic refractories in an overall basic refractory product market based on interchangeabil-

ity of use is the fact that tar impregnated and tar bonded refractories are used exclusively in the basic oxygen furnace and are not employed to any significant extent in any other steelmaking process. If interchangeability of use were the sole criterion for determining the relevant line of commerce we would exclude these refractories. But as we discuss in detail below, the record shows sufficient production flexibility between the producers of the so-called BOF refractories and other basic refractories to persuade us that these tar-strengthened bricks belong in the overall basic refractory market. [10]

Respondent also contends that non-basic refractories are frequently substituted for basic refractories so that an overall market should not exclude, at least if the market is to be based on end use criteria, the non-basic refractories. Quite clearly in some zones in steelmaking, glassmaking, and other industries that utilize basic refractories non-basic refractories may be, and are, employed. The ALJ's response to this, with which we agree, was that non-basic/basic substitution occurs only in extremely limited "grey areas," comprising merely 2%, for example, of the electric arc furnace. And even in such limited areas, some steelmakers will use non-basic refractories while others will use basic refractories without thought of substitution. Thus, even in these so-called grey areas there is not ready substitution of basic for non-basic or the reverse. Most importantly, even such substitution or capacity to substitute as does exist does not seriously weaken the insulation that a basic refractory producer enjoys from non-basic refractory competition. For most purposes, steelmakers, glass producers and other users of basic refractories simply cannot look to producers of non-basic refractories for price, quality or delivery options if the basic refractory market fails in any of these respects. For that reason it does not make economic sense to include non-basic refractories in the overall refractory market or in any submarket when considering the competitive impact of the subject acquisition.

Production Flexibility

Just as the bonding process and the raw material composition of refractories distinguish one refractory from another, these two factors determine the degree of flexibility in the production of refractories. Generally *all* refractories, including basic and non-basic, bricks and specialties, are subject to crushing, grinding, and in

the case of bricks, pressing. The equipment is adaptable to all types and forms of refractories.⁶ Thus the production process through the pressing stage remains the same no matter what raw materials are used or bonding process applied. As noted, after pressing, bricks are strengthened by a variety of bonding processes: chemical bonding, regular fired, direct bonding, tar bonding and tar impregnated. For chemical bonding, bricks are diverted to a chemical drier. (Tr. 864) When regular fired or direct bonded, bricks are sent to a [11] tunnel kiln. The kiln's temperature determines whether the refractory is regular fired (between 2750-2900° F) or direct bonded (generally above 3100° F). The changeover from regular to direct bonding takes from 12 to 24 hours while the reverse, from regular bonding to regular fired, requires 5 to 8 hours. No changeover time is required in switching to a chemical bonding process. Instead the bricks, as noted, are diverted to a chemical drier.⁷

Tar bonded and tar impregnated bricks can also be produced on the production lines utilized to produce chemically bonded, regular fired and direct bonded bricks. A tar impregnated brick is crushed, ground and pressed on the same equipment as are other refractories. After pressing, the product is burned in a tunnel kiln at approximately 2800° F and then impregnated with tar in an autoclave. The firing gives the brick a chemical bond, after which the pores of the brick are filled with tar to rid the brick of porosity. (Tr. 869) The tar bonded brick is a less strong, ceramic bonded brick that is simply mixed with the tar, pressed and "ship[ped] as it is." (Tr. 869)

Considerations other than equipment (e.g., tunnel kilns, chemical bonding driers) determine the capacity of a manufacturer to change the composition of the raw material. Because it is extremely important that a refractory not contain foreign raw materials, a changeover to a different raw material presents the problem of contamination. Thus, to effect the changeover, production facilities are thoroughly cleansed of any foreign raw material, a time-consuming process of apparently varying lengths. Some witnesses testified that the process required several months, others 8 hours. (Tr. 1659) [12]

A further indicium of a market based on production flexibility is that major firms in the industry produce both products. It is, therefore, significant that firms accounting for 97% of basic brick production also produce specialties, that these firms' specialty

⁶ However, only 30 to 40% of the production facility used to produce non-basic refractories could be salvaged in a changeover to basic brick production. (Tr. 670)

⁷ The general manager of the U.S. Refractories Division of General Refractories testified that his firm's production line is capable of switching back and forth from the production of chemical bonded, regular fired and direct bonded basic refractories and will do so as many as twenty times over the period of a year. (Tr. 664-68)

production comprises 60% of the specialty market and that six of the ten leading basic specialty producers also manufacture basic bricks. (I.D. p. 22) It is not necessary that the record reveal (and it does not) the full extent to which these firms utilize the same production lines in the manufacture of both bricks and specialties. What is important is that a firm producing either basic bricks or basic specialties necessarily achieves the technological capacity to produce the other product. That a firm utilizes the same facilities⁸ demonstrates that this is the case as does, of course, the fact that such a large percentage of firms produce both basic specialties and basic bricks.

Also relevant when considering production flexibility as a guide to determining the relevant line of commerce is evidence of common customers; of common technology in the application (in contrast to the production) of the products particularly where, as here, the industry is technology-intensive, and of common raw materials in producing both products. The record is clear in this regard—both basic specialty and basic brick producers sell to the steel industry; both must develop products that will withstand the emissions of steelmaking furnaces, and both utilize the raw materials magnesite, chrome ore or dolomite. Excerpts from the A.P. Green publication (*supra* at 4) amply demonstrate this.

Respondent argues that contamination between basic and non-basic refractories is no greater than the contamination from one *basic* raw material to another *basic* raw material so that from the standpoint of production flexibility the market is under-inclusive in excluding non-basic refractories. Respondent simplifies the record on this point; the record shows that producers that readily change from the production of basic refractories comprising different raw materials will not, because of contamination problems, introduce non-basic material on the same production line. Additionally, all firms in the market, except for the Dolomite Brick Corp. of America, utilize magnesia and chrome ore in producing basic refractories, either individually or in combination. Different performance characteristics can be imparted to a refractory by altering the ratio of these [13] two raw materials (Tr. 127) or upon changing their quality or grade.⁹ When performance characteristics are affected by changing the ratio of one basic raw material to another or altering their grade and quality, no contamination problems exist and production flexibility is not inhibited at all, at least not on the basis of contamination considerations.

⁸ American Refractories Company produces a variety of basic bricks and specialties in the same facility and changes from the production of one to the other "to fit and satisfy the shipment our customer demands." (Tr. 111)

⁹ *Supra* at 8.

We are thus persuaded that the level of production flexibility and interchangeability of use is sufficiently high and unique among basic refractory products that they constitute a relevant line of commerce. While in *Coca-Cola Bottling Co. of New York*, Dkt. 8992 (Jan. 23, 1979) [93 F.T.C. ———], the market was comprised of a variety of products “arrayed along a set of continua” of price and sweetness, here there is a continuum of performance characteristics. At its extremes (*i.e.*, chemically bonded and tar impregnated bricks) products share performance characteristics (and consequently, end-use interchangeability) only to a limited degree, but even those products at the extremes of the continuum are sufficiently close in production flexibility to warrant inclusion in an overall market comprised of all basic refractory products.

Submarkets

The aforementioned array of refractory products, not surprisingly, yields a number of submarkets. The complaint alleged, and the ALJ found, four: basic bricks, basic specialties, BOF (basic oxygen furnace) bricks, and conventionally bonded bricks. Basic bricks and basic specialties are a breakdown of the overall basic refractory market. BOF and conventionally bonded bricks are essentially a division of the basic brick submarket. We agree with the ALJ that these delineations make economic sense. We note, however, that the degree of distinctiveness that characterizes each [14] of these submarkets varies. This, however, does not lessen their appropriateness as relevant lines of commerce for testing the anticompetitive effect of the acquisition.

Basic Bricks and Basic Specialties

While basic bricks and basic specialties can be substituted for each other, they are often used to complement one another as well. *United States v. Grinnell Corp.*, 384 U.S. 563 (1966) For some purposes, only basic specialties can be utilized. As an example, for prolonging the life cycle of a refractory lining, basic specialties are rammed, cast, gunned, or troweled over or between basic bricks. (CX 91-97) Basic bricks have no similar function.¹⁰ In addition, basic specialty

¹⁰ The U.S. Steel's Manager of Processed Metallurgy graphically described how specialties complement the use of bricks:

A gunning mix is a basic specialty that is applied with a pneumatic gun. It is a maintenance material. The gunning technique is used to place refractories wherein you don't have a mason . . . laying brick. You can use it to spray an area that is being worn faster than you would like. You can patch deep holes and gouges and things with a gunning mix. It is a non-contact method of applying. You can stand here and gun over about at that able. In fact, you can gun a roof of an open hearth some 20 feet away along a stick or along a pipe. (Tr. 1305)

manufacturers often do not make basic bricks and while basic brick manufacturers have the capacity to produce basic specialties, and almost invariably do so, more often they will manufacture them in separate facilities.¹¹ These factors make it proper to separate basic refractory bricks and basic refractory specialties into submarkets.¹² [15]

Respondent argues that the basic brick market is overinclusive as there is insufficient interchangeability of use among all basic bricks. "BOF's do not use the same type of bricks used in OHF's" and "substantial additional equipment is needed for [producing] each [type of brick], and the flexibility of the great majority of existing plants is limited to only some of the listed types [of refractory bricks]." (RAB 25) As was pointed out in discussing the overall refractory market, incomplete interchangeability of use or incomplete product flexibility does not diminish the significance of a market or submarkets so long as one of these criteria link the products.

Respondent contends that the specialty market is also overinclusive, containing, as an example, Kaiser's P-165 (comprised of magnesite) and Lavino's Plastic-KN (made of chrome ore) which are not interchangeable. While used in the same furnaces, they are placed in different zones. This argument fails as the record shows that at the time of the acquisition both firms possessed the technological capabilities to produce the product of the other and were familiar with industry needs which both had met with an array of products. This is not a case where restrictive patents or raw material shortages or capital insufficiencies prevented either firm from developing products complementing those it was producing. A gap then in the product line of either Kaiser or Lavino in 1973 is not of great significance.¹³ [16]

Conventionally Bonded Bricks

Although this market is comprised of bricks made of three different raw materials (dolomite, magnesite and chrome ore) or a combination of magnesite and chrome ore, and of three different strengthening processes: chemical bonding, regular bond and direct

¹¹ Forty percent of the leading basic specialty producers do not manufacture basic bricks but 97% of the basic brick manufacturers produce basic specialties. *Supra* at 12.

¹² In reaching this conclusion, we do not rely upon the ALJ's conclusion that "[p]rices for basic bricks are set without regard to the price of specialties" (I.D. p 54) as the record evidence (i.e. CX 56Q) is simply too equivocal regarding the sensitivity to price changes between basic specialties and bricks.

¹³ Non-basic refractory specialties and non-basic refractory bricks are properly excluded for the reasons set out in our discussion of why non-basic refractories should be excluded from the overall basic refractory market. *Supra* at 10.

bonded, there is a marked degree of flexibility in the production of all except for dolomite.¹⁴ As we have detailed above, a manufacturer of a regular bonded refractory (which is strengthened by submission to heat in a tunnel kiln) can produce a direct bonded refractory by increasing the temperature in the same tunnel kiln.¹⁵ The same firm can produce chemically bonded brick by diverting its production to equipment that adds chemicals to the refractory to give it strength.¹⁶ Not only does production flexibility of this sort warrant the inclusion of chemically bonded, regular bonded, and direct bonded bricks in the same market, so does the high level of interchangeability of use of these bricks. Each of the products can be and is used in the lining of open hearth and electric arc furnaces.

Respondent is correct in pointing out that not each of the types of refractories comprising this submarket can be substituted for every other. Again, however, absolute interchangeability of use is not necessary in determining whether diverse products should be considered as an economic unit. Another argument, that there are a few zones in furnaces, such as the door in the electric arc furnace, that have special needs and utilize products outside this [17] submarket, is not persuasive. Steel manufacturers when constructing most zones in their open hearth and electric arc furnaces can only look to the producers of conventionally bonded bricks. If faced by an oligopoly of conventionally bonded brick producers, it will be of no comfort to the steel manufacturers planning to line an entire furnace that in lining the door of their electric arc furnace they may shop elsewhere.

BOF Bricks

The basic oxygen furnace brick submarket is comprised solely of tar impregnated and tar bonded bricks. These refractories are applied almost exclusively to the basic oxygen furnace and the BOF's needs are met virtually entirely by these two products.

Respondent argues that "not all BOF's or portions of BOF's are built with either tar bonded or tar impregnated bricks, and not all tar bonded and tar impregnated bricks are used in BOF's." (RAB 27) This slight departure from perfect symmetry is, however, insignificant and does not at all impair the usefulness of the basic oxygen refractory submarket as one in which to test the impact of the

¹⁴ Conventionally bonded dolomite brick is only made by one company and does not account for a large segment of the market. Nonetheless, it should be included in the market because the degree of interchangeability of use is significant between the dolomite brick and the other conventionally bonded bricks.

¹⁵ *Supra* 10-11.

¹⁶ The front end of the production line (i.e., through the pressing stage) is the same in producing each type of conventionally bonded brick.

subject acquisition. Respondent further argues that the market should include the fused cast brick as it has some application in basic oxygen furnaces. This brick is made by fusing refractory raw materials together into a liquid and pouring the molten material into a mold. After cooling, brick shapes are carved from the cooled mass. There is, therefore, no production flexibility of significance between fused cast brick and the basic oxygen refractory brick. The president of Harbison-Walker Refractories testified that the "bulk of the material being used in the BOF furnace . . . is 100 percent magnesia tar bonded or tar impregnated bricks." (Tr. 941) Thus, the presence of the fused cast brick as an alternative to the tar bonded and tar impregnated brick is limited and does not affect the integrity of the basic oxygen brick submarket.¹⁷ [18]

D. Probable Effects of the Merger

The administrative law judge relied principally, though not exclusively, on statistical data in holding that the challenged acquisition "may . . . substantially lessen competition" in the five relevant product markets. Respondent does not contend that the data is unreliable from a statistical standpoint but that it is not reliable as a basis for predicting the competitive impact of the acquisition. We discuss respondent's contentions in this regard after reviewing the evidence bearing on competitive injury.

It is helpful to set out market shares and concentration figures in each of the relevant lines of commerce as found by the ALJ of the top two, four and eight firms and the market shares of Kaiser and Lavino, together with their rankings in the market, both pre-acquisition and post-acquisition.

Basic Refractories Market

	<i>1973 Pre-Acquisition</i>	<i>1973 Post-Acquisition</i>
Two Firm	33.18	42.48
Four Firm	53.06	62.16
Eight Firm	83.80	88.51
Kaiser (rank)	11.87 (2)	21.18 (2)
Lavino (rank)	9.30 (4)	—

¹⁷ Respondent's contentions relating to the lack of actual competition between Lavino and Kaiser were generally raised in its analysis of relevant product markets. But since these contentions bear more on the significance of market shares, we will consider them *infra* at 21 in examining the probable effects of the merger, and in this connection market shares and concentration figures relied upon by the ALJ.

Basic Specialties Market

	<i>1973 Pre-Acquisition</i>	<i>1973 Post-Acquisition</i>
Two Firm	37.49	39.50
Four Firm	67.01	70.14
Eight Firm	88.30	91.43
Kaiser (rank)	14.82 (3)	17.95 (2)
Lavino (rank)	3.13 (9)	—

Basic Refractory Bricks Market

	<i>1973 Pre-Acquisition</i>	<i>1973 Post-Acquisition</i>
Two Firm	41.35	50.92
Four Firm	64.68	75.18
Eight Firm	94.29	96.68
Kaiser (rank)	10.49 (6)	22.70 (2)
Lavino (rank)	12.20 (3)	—

[19] BOF Basic Bricks Market

	<i>1973 Pre-Acquisition</i>	<i>1973 Post-Acquisition</i>
Two Firm	(unavailable)	(unavailable)
Four Firm	81.46	85.44
Eight Firm	98.35	99.97
Kaiser (rank)	3.97 (6)	12.07 (4)
Lavino (rank)	8.09 (4)	—

Conventionally Bonded Basic Bricks Market

	<i>1973 Pre-Acquisition</i>	<i>1973 Post-Acquisition</i>
Two Firm	46.44	60.48
Four Firm	75.57	84.84
Eight Firm	96.87	99.57
Kaiser (rank)	14.04 (4)	29.22 (2)
Lavino (rank)	15.17 (2)	—

Evidence other than market shares and concentration figures bearing upon the probable effect of the acquisition was also relied upon by the ALJ. The record shows that there is no reasonable expectation that deconcentration can be anticipated through new entrants. Exit, not entry, has marked the industry for many years. Of the 159 firms producing refractories in 1956, 96 remained in 1971 (RX 10B; RX 27C). Additionally, entry barriers are high (no firm has entered since 1964) so that administered pricing or other non-competitive performance by the industry, while perhaps making t

market inviting from an investment standpoint, will not likely be relieved by new entrants.¹⁸

Kaiser's "strategic plan outline" identifies three obstacles to entry:

(1) "... there is customer industry bias to conservatism and reluctance to endanger huge facilities on untried product. This can be a barrier to entry of new refractory companies." (CX 12Q) [20]

(2) Because "there is a continuing customer desire to extend average life, usually by upgrading the refractory used in 'critical zone' (which sets maximum life of lining)", technological and development capabilities are essential to growth and, of course, entry. (CX 12"O")

(3) Because "there are . . . situations where the supplier loses position [with buyers] if he lacks a broad line of products" (CX 12"O"), entry with a limited range of product is difficult.

The record reveals then several indicators bearing on the probable competitive impact of the acquisition: post-acquisition concentration is high, ranging (on a 4-firm basis) from 62.16% to 85.44%; the market shares of the acquired and acquiring firm are significant (Lavino's market shares, pre-acquisition, ranged from 3.3% to 15.17%, and Kaiser's, post-acquisition, ranged from 12.07% to 29.22%); concentration increased significantly among the top four firms, from 3.13% to 10.5%; entry barriers are formidable, and smaller firms have been exiting from the industry, thereby exacerbating the consequences of the loss via merger of independent competitors.

The ALJ found, and respondent agrees, that these indicators make out a *prima facie* case of Section 7 Clayton Act violation. Respondent contests, however, the significance of Lavino's market shares, arguing that the figures are not reliable predictors of the probable competitive consequences of the acquisition because Kaiser and Lavino were generally not (a) actual competitors in the relevant product markets and (b) Lavino's financial prospects were so dismal at the time of the acquisition that the company was, as was the acquired firm in the *General Dynamics* case,¹⁹ a "far less significant actor" in the market than its market shares would otherwise indicate. We turn next to respondent's contentions relating to the lack of actual competition and then to Lavino's financial condition.

¹⁸ Even if the evidence were to the contrary, little significance will be given to the lack of entry barriers in a total acquisition, as the loss of a firm through acquisition is immediate and the effects through entry are "attenuated." *Ekco Products Co.*, 65 F.T.C. 1163, 1208 (1964), *aff'd*, 347 F.2d 745 (7th Cir. 1965).

¹⁹ *United States v. General Dynamics Corp.*, 415 U.S. 486, 503 (1974).

Actual Competition

What we are looking for in determining whether the statistical data should be adjusted or discounted in any fashion is evidence that diverse products in the same market are not made both by the acquired and acquiring firms or by one of them. If that is the case, some adjustment of concentration figures or market position in the market may be necessary, depending upon the factors that have led the firms or firm not to produce the product, and whether it is likely that these obstacles will persist or would be readily surmountable under the appropriate circumstances. Having combed the record and respondent's briefs, we have discerned the following:

BOF Bricks

Respondent's contentions relating to this market can be reduced to two points: (1) that fused cast brick is also used in basic oxygen furnaces and so, along with tar bonded and tar impregnated bricks should be included in the BOF market and (2) that Kaiser's tar impregnated brick is not used, presumably because of its inadequate performance characteristics, in the basic oxygen furnace.

Fused cast bricks, as we have noted, are made by an entirely different process than are the tar impregnated and tar bonded bricks and so including them in a market based on product flexibility would not be warranted. However, because fused cast brick has been, as respondent asserts, utilized in basic oxygen furnaces, the universe used to determine concentration figures in this market may be understated to a small degree. (Tr. 941) Considering, however, that the four-firm concentration in the production of BOF bricks was 85.44% post-acquisition, the slight reduction warranted by the occasional use of fused cast bricks hardly suffices to render this market competitive. (Tr. 397)²⁰

Kaiser's failure to do well in the basic oxygen furnace submarket does not affect the significance of Lavino's position. But even as to Kaiser's market position, no adjustment is necessary as nothing in the record shows that Kaiser, with its vast resources, its technological capabilities, and its experience in producing and selling refractories, would not soon develop a suitable basic oxygen brick for use in this submarket. It remained, in short, a competitive factor whose position should not in any fashion be discounted. [22]

²⁰ The overall basic refractory and basic brick market would similarly be affected, but to even a lesser degree as BOF bricks comprise a small portion of these markets.

Basic Bricks

While respondent does not contest the finding that the geographical market is the nation, Kaiser contends that only 25% of its basic brick production was sold to eastern steel producers and 90% of Lavino's production of basic bricks went to eastern steelmakers. This, of course, does not bear on Lavino's market position or upon concentration figures. Additionally, it is not necessary that the acquired and acquiring firms' sales be to the same customers in order for concentration figures to have significance. *RSR Corporation*, 88 F.T.C. 800 (1976), *aff'd*, CCH 1979-1 Trade Cas. ¶62439 (9th Cir. 1979). More importantly, these figures evidence the fact that Kaiser had the capacity to sell and did sell on a significant scale in the same region as Lavino, so that no adjustment is warranted.

Basic Specialties

Kaiser's magnesia ramming and gunning mix, respondent contends, is not interchangeable with Lavino's plastic chrome ore. Further, Kaiser's sales of chrome ore specialties was less than \$1,000 in 1973, while Lavino sold "a small amount of magnesia ramming mix" in that year (RAB 24). The small amount of overlap between the two firms as to these specific specialties does not warrant an adjustment in market shares. Both firms clearly have the capacity to produce the products in question. That, as of 1973, great success had eluded each as to its competitor's specific product proves very little about their long term prospects, and it is these prospects that are central to determining the likely effect of the acquisition.

Conventionally Bonded Brick

Respondent claims that Kaiser's direct bonded brick, unlike Lavino's, failed to meet the performance requirements necessary for use in electric arc sidewalls and open hearth roofs and so was used in less sensitive areas in these furnaces (RAB p. 30, n. 39). The inadequacy of the Kaiser product, of course, does not diminish the significance of Lavino's market shares. At most it could indicate that Kaiser's position in the market is somewhat overstated, but only prior to the acquisition. However, this is speculative. In any event, for purposes of determining the likely competitive effect of the acquisition, the important statistical figures are those showing concentration before and after the acquisition and the market position of the acquiring firm post-acquisition. These figures are not affected by Kaiser's apparent failure in 1973 to develop a high performance chemical bonded brick. [23]

Financial Condition of Lavino

The financial condition of the acquired company at the time of the acquisition may be relevant to show (a) that a firm is faced with a "grave possibility of business failure"²¹ and that the prospects of recovery through reorganization are "dim or nonexistent"²² or (b) that the acquired firm's assets, because of circumstances beyond its control, will not strengthen the acquired firm and any increase in concentration will not persist over time. The first of these showings relates, of course, to the failing company defense and requires the additional showing that no other purchaser was available to make the acquisition.²³ Essentially, this defense is based on the notion that although an acquisition may be anticompetitive, it is in the public interest to permit the acquisition (*i.e.*, jobs that might otherwise be lost in the short run may be saved and assets that might be temporarily dissipated will continue to contribute to the economy). Respondent does not contend that the failing company defense is applicable in this case.

Respondent argues instead that the acquisition was not anticompetitive because Lavino would not have continued as a viable competitor in the sale of refractories. Respondent relies on what has come to be called the *General Dynamics* defense, but we believe that it misapplies the holding of that case. In essence, the *General Dynamics* decision stands for the commonsense proposition that an increase in concentration will not persist no matter how impressive the market shares of the merging firms at the time of the acquisition if, at the time of the acquisition, the key competitive assets of either merging party were so depleted that they could not be revived by either the acquired or the acquiring firm. The Court found in *General Dynamics* that in the coal industry "a company's power effectively to compete with other companies lies in the state of a company's uncommitted reserves of recoverable coal".²⁴ [24]

Because United Electric Coal Companies, the acquired concern, had neither reserves nor prospects of obtaining reserves, the company was not a significant competitive factor and, more to the point, did not provide General Dynamics with the wherewithal to enhance its competitive position (as measured by its market share). Hence, neither General Dynamics' long term competitive position nor long term market concentration generally was affected as a consequence of the acquisition. The Court thus concluded that the

²¹ *Citizens Publishing Co. v. United States*, 394 U.S. 131, 137 (1969).

²² *Id.* at 138.

²³ *Id.* at 137.

²⁴ *Supra* at 502.

acquisition was not likely to be anticompetitive, even though the combined market shares of the merging companies at the time of the merger were high.

The Court did not denigrate concentration and market share figures as the best available measurement of the effects of a merger—it merely insisted that contemporaneous figures give way where it could be shown by way of an affirmative defense that they were unlikely to persist over time. Indeed, the Court indicated that market shares and probable future competitive effects could best be measured by examining uncommitted coal reserves, in effect substituting a more reliable statistical test for the traditional standard based on current production or sales. It seems clear that the Court did not intend to attach significance to every negative factor concerning a firm's operations, particularly where the evidence relates to conditions within the control of one of the parties to the merger. As the Court observed in *General Dynamics*, the evidence there “implied that United Electric *was not merely disinclined* but unable to compete effectively for future contracts.” *Id.* at 506 (emphasis added).

To utilize the defense, then, a respondent must show (a) that one merging firm's market share (in this case, Lavino's) could not be imparted to the other merging firm, so that any increase in concentration will not likely persist over time, (b) that the merging firms had no control over the circumstances that weakened the position of the merging firm whose market shares will be discounted and (c) that neither firm could remedy the position of the weakened firm. Lavino's situation, assuming the worst possible case, does not meet these criteria.²⁵ [25]

Respondent characterizes Lavino's position as follows: “By late 1970 [irresistible market forces] had led IMC to a sound business decision to channel its capital to more productive areas and salvage what it could of its investment in Lavino. In the two ensuing years, 1971-73, new investment in the division was cut to a minimum; R&D expenditures were severely curtailed; and cutbacks were made in the sales and technical service departments. The planned expansion of the product line was cancelled; plant maintenance was deferred wherever possible; and the Newark and Freeport plants were closed and liquidated.”²⁶

²⁵ The decision in *United States v. International Harvester Co.*, 564 F.2d 769 (7th Cir. 1977), an opinion strongly relied upon by Kaiser, does not call for a different result here. The court there concluded that Harvester's acquisition of a 39% stock interest in Steiger Tractor, Inc., helped preserve Steiger as an independent competitor in the market rather than eliminating competition between the two firms. The court also noted that concentration had decreased slightly since the merger and several new firms were entering or about to enter the market. *Id.* at 778. Surely *International Harvester* is a most unusual case and not applicable to this matter.

²⁶ RAB 32.

Additional problems hampering the Lavino operation included need for capital improvements of its two production plants, substantial infusion of money to update its research and development and the expansion of its product line.

None of these problems were such that they could not be remedied with the financial resources, technical know-how, and general experience of Kaiser or other similarly situated concerns, including IMC. Thus, while "Lavino was unable to make high quality magnesia products at the Gary plant [because of IMC's decision not to improve that facility],²⁷ with Kaiser capital the plant was modified to do so." (RAB 41 n. 56) And further, "Kaiser . . . improved the performance of the Lavino plants and has used them in the improvement of its own products" (RAB 42)

Kaiser's position was enhanced not only because of the addition of Lavino plants. Lavino's valuable long term, low cost supply contract guaranteed respondent a source of magnesite. (RX 364; Tr. 2414) Additionally, the sophisticated research and development capability that had characterized Lavino's operations was folded into and came to dominate Kaiser's R&D in basic refractories. For four years following the acquisition, four of the five professionals comprising Kaiser's R&D were former Lavino personnel. (Tr. 2717-18; 2723-26) [26]

Not surprisingly, then, in 1974 the North America Refractories Co., a competitor of Kaiser, in reviewing the strengths of firms in the industry, had this to say about the prospects of Kaiser-Lavino: "The Kaiser-Lavino merger will make for a stronger competitor because of their [presumably both Kaiser's and Lavino's] production capacity and research capability." (RX 400D) In 1976 the same competitor noted that Kaiser had "generated impressive record performances resulting in penetration into our markets." (RX 408F)

This, then, is a case where the acquiring firm, Kaiser, gained viable and valuable assets which enabled it to aggrandize its already formidable market positions in several highly-concentrated markets and submarkets.²⁸ As well as increasing the size of the acquiring firm, the merger has wrought substantial increases in concentration in the relevant markets, and there is no reason suggested by the

²⁷ Counsel for respondent conceded at oral argument that either IMC or another company could have achieved what Kaiser had with Lavino but IMC had not because "they wanted out". (Transcript of Oral Argument 4073,74)

²⁸ Respondent contends that the acquisition was procompetitive as Kaiser is a more vigorous and effective competitor as a consequence of the acquisition. The strengthening of a competitor cannot be equated with strengthening competition. Certainly this is clear when, as here, enhancing the acquiring firm's position means the loss of an independent decisionmaker and an increase of concentration. By contrast, as we have noted, in *International Harvester* competition was enhanced by the "acquisition" because the acquired firm remained independent and gained competitive vigor it would have lost except for Harvester's infusion of capital and because concentration decreased.

record to believe that these high market shares among the top firms will not persist. It was precisely to prevent such increases in concentration, with the concomitant opportunities for interdependent oligopolistic behavior they bring with them, that Section 7 was enacted, and the merger of Kaiser and Lavino clearly falls within its proscription. [27]

E. Relief

To restore competition in markets adversely affected by an illegal acquisition, divestiture is commonly considered the most "appropriate relief."²⁹ When, as here, the acquiring and acquired firms were competitors in the same markets, divestiture will "minimally bring about deconcentration in the adversely affected markets and may additionally serve to restore competition in the relevant markets by lowering or checking the rise of entry barriers, decreasing the possibility of entrenchment and re-establishing toehold firms."³⁰

The purpose of an effective order, then, must be to divest Kaiser of the assets it obtained by the illegal acquisition and to restore Lavino as a viable entity of roughly the same competitive capacities it possessed before the acquisition. Because Kaiser was not required to and did not hold separate the Lavino assets it had acquired in 1973, and further because in order to survive and thrive in the relevant markets the new Lavino must possess assets other than plants, customer lists and the like, an effective order must necessarily require more than a simple, straightforward divestiture of what Kaiser acquired in 1973.

Mindful of these considerations, the ALJ required (1) the divestiture of all assets of Lavino acquired by Kaiser (Order provision I); (2) that Kaiser not hire any employee of Lavino for three years (IV); (3) that know-how, patents and trade secrets developed since the acquisition and for a period of five years after the divestiture be made available to Lavino without charge (IX); (4) that the raw material magnesite obtained from Harbison-Walker be made available either by assignment from that company or through Kaiser for three years following the divestiture (X); (5) that Kaiser assist in hiring and establishing a research and development staff for the new Lavino (XI); (6) that Kaiser provide Lavino a list of customers who purchased basic refractories from Kaiser within the three year period of the divestiture (XII); and (7) that Kaiser not solicit for two years customers that purchased from Lavino during the year prior to

²⁹ *United States v. E. I. duPont de Nemours & Co.*, 366 U.S. 316, 328 (1961).

³⁰ *Litton Industries, Inc.*, 85 F.T.C. 382 (1975).

the acquisition if they did not deal during that year with Kaiser (XVIII). [28]

Because the new Lavino's success will depend in large part upon its R&D capabilities, it is appropriate that the order provide for technical assistance to the new Lavino. As drafted by the ALJ, the order would do this by requiring Kaiser to provide know-how, patents, and trade secrets developed after the divestiture; to assist Lavino in establishing its own research and development capacity, and to divest both the patents acquired as a result of the acquisition of Lavino and the improvements on these patents.

With one modification we believe that each of these provisions is proper and necessary to the development of a viable Lavino. Respondent objects particularly to the provision that would require Kaiser to share technological know-how for a period of five years following the divestiture. We agree that once Lavino's research and development staff is in place it should not be necessary and might even be counterproductive for the new Lavino to have access to Kaiser's research and development. Sharing of research and development can have a depressing effect on both companies, inhibiting Kaiser's inventiveness and dampening the need for bold initiatives by Lavino. The order will, therefore, require that Kaiser provide research and development know-how until such time as Lavino's research and development staff has been hired. Because the professional research and development staff will need *some* nurturing, Kaiser will also be required to share research and development for six months following that date. The ALJ considered a period of one year from the divestiture long enough for Kaiser to be obligated to assist Lavino in establishing a research and development staff. We agree, and so that provision is so limited, and the period that Kaiser will be required to share the fruits of its research and development will not exceed 18 months following the divestiture.

We also agree with respondent that the antisolicitation provision should not be included in the order. This is an industry in which the relevant products differ in quality from one manufacturer to the next and so the effect of denying a customer access to even one seller's products (whether by an illegal merger or by an overzealous order provision) may have adverse competitive implications. Because of this and because the benefits that Lavino would gain from the provision are marginal, the provision is not warranted and will not be included in the order. [29]

We agree with the ALJ that the new Lavino should have access to magnesia pursuant to the Harbison-Walker supply contract, either by assignment directly from Harbison-Walker or through Kaiser. We

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agree with respondent that the price of the raw material if acquired from Kaiser should be the price that Kaiser pays Harbison-Walker. Accordingly, the provision drafted by the ALJ relating to the supply contract, without the modification recommended by complaint counsel, is adopted.

The provision recommended by the ALJ prohibiting the hiring by Kaiser of Lavino employees for three years is too harsh for the purpose intended — to prevent the pirating of Lavino personnel by Kaiser. Complaint counsel recommend a modification, with which we agree, that would prohibit hiring of Lavino personnel without Commission approval. In this way any unreasonable stripping of the new Lavino can easily be forestalled without unduly hampering the natural exchange of personnel among competitors.

Respondent raises questions with respect to other provisions in the order recommended by the ALJ. In Paragraph VIII the ALJ requires that Kaiser not acquire a firm producing basic refractories without Commission approval for a period of fifteen years. Respondent contends that such a moratorium should not exceed the ten years ordinarily imposed in Section 7 orders. We agree, because there is nothing in the record showing that a period longer than the customary ten years for such a provision is warranted.

Complaint counsel recommend several additions and modifications to the order recommended by the ALJ. They would add two provisions relating to the preservation of assets pending divestiture. These will be included in the order. Complaint counsel also suggests a modification of the moratorium provision which will make it clear that it applies to acquisitions of firms with a presence in the United States basic refractories market. The provision is so modified.

Respondent presses for a proviso that would require that the purchase price exceed the liquidation value of the Lavino assets. Only in this way can the Commission be assured, respondent argues, that a purchaser will not raze the Lavino plants and develop shopping centers on their sites. Respondent's argument assumes that no purchaser would develop the Lavino assets along the lines envisioned in this opinion if the purchase price is less than the liquidation value of the assets. No such assumption is warranted. We do recognize, however, that the purchase price as it relates to the liquidation value of the company is a factor to be considered in determining whether a purchaser is acceptable. But the problem of finding an acceptable purchaser is a matter for compliance. We will not unduly complicate the quest by the imposition of provisos and conditions that may be deficient in failing to anticipate the dimensions of the task.

CONCURRING OPINION OF COMMISSIONER PITOFKY

I agree that the acquisition by Kaiser of the assets of the Lavino Division of IMC violates Section 7, and agree with the reasoning of the majority opinion except that portion which finds the existence of an overall relevant product market consisting of basic refractory bricks and basic refractory specialties. Nevertheless, I concur in the opinion since I agree that the four other relevant product submarkets can be sustained and the combined market shares in those markets are sufficient to support a finding of a violation.

With respect to the more inclusive brick-specialty product market, the majority opinion recognizes that there are few instances in which brick or specialty are direct substitutes. Both categories are manufactured in most plants in the refractories business, but the Administrative Law Judge found that there is no cross-elasticity between the two:

Prices for basic bricks are set without regard to the price of basic specialties and different refractories' producers are the price leaders in each market. (Findings 131, 158; CX 56 Q.) Basic bricks are recognized as a distinct product market by the steel companies and by refractories' manufacturers. (Initial Decision, p. 54.)¹

[2] Given that finding, there ordinarily would be little reason to expect that bricks and specialties could be in the same product market. In briefing and oral argument, counsel supporting the complaint attempted to surmount this apparent separateness of the brick and specialty markets by arguing along the lines of *Philadelphia National Bank*² that bricks and specialties belong in the same market on a "cluster" theory — i.e., that apparently different products with different prices and uses may be in the same relevant product market if they are as a group sufficiently distinctive to be free of effective competition from other products and if customers, as a practical matter, do all or some of their shopping for some of those products from the same sellers at the same time. 374 U.S. 321, 356. L. Sullivan, *Antitrust* 59-61 (1976). While it is true that bricks and specialties are often sold "under the same roof" in many refractory plants, it does not follow that there is any economic reason why customers would choose to do their brick purchasing and specialty purchasing from the same company. [Cf. *United States v. Phillipsburg National Bank*, 399 U.S. 350, 359-360 (1970).] Indeed, there is a finding by the administrative law judge that basic specialties and

¹ The majority has some doubts about, but does not explicitly reject, this finding. Even if the finding were rejected, it would not affect this opinion since it would still be the case that there would be no evidence of substantial cross-elasticity of demand between bricks and specialties.

² *United States v. Philadelphia National Bank*, 374 U.S. 321 (1963).

basic bricks are purchased by different persons in the steel industry, basic specialties being sold to the steel producing superintendent and basic bricks to the masonry superintendent (Finding 130). Given that background and the absence of economic linkage, the majority, in my opinion, has wisely not written its opinion supporting a brick-specialty market on a "cluster" theory.

Instead, the key argument by the majority turns on the concept of production or supply flexibility. Thus, the majority assumes that if the price of bricks or specialties were to rise, it would not follow that purchasers would switch from one category to the other. The majority opinion predicts, however, that manufacturers would switch existing machinery producing one product category in order to satisfy demand for the higher priced product, and this ready transferability of production capacity puts the two categories in the same product market. There is an administrative law judge finding on which the majority relies to the effect that the two product categories — bricks and specialties — are manufactured on some of the same equipment and that a refractories manufacturer may switch from basic bricks to basic specialties in response to consumer demand (Finding 103). [3]

Supply substitutability, of course, can be a factor leading to a finding of a single relevant market, and can be a useful concept in tracing the dynamics of product competition. *United States v. Columbia Steel Co.*, 334 U.S. 495 (1948); 2 P. Areeda & D. Turner, *Antitrust Law*, §526 (1978). Here, the record clearly shows that there is a *capacity* for supply substitutability, *i.e.*, that there is some possibility at some point that machines currently committed to manufacturing bricks could be converted to manufacturing specialties and vice versa. I do not believe, however, that is adequate to support a finding that the two product categories are in the same relevant product market. First, there is no evidence of actual switching of equipment from bricks to specialties, or vice versa, in response to changing conditions of supply and demand. Also lacking is evidence to demonstrate that machinery would be shifted from one category to the other relatively promptly in response to relatively modest price changes.³ Without a record to show actual or likely shifts of production resources, there is no reason to expect that manufacturers of bricks, in determining what price to charge, would

³ Since a specialty is in some sense an intermediate product on the way to producing brick, it is perhaps plausible to assume that brick makers could switch production to specialties although even here there is a cost factor involved. There is absolutely no reason to speculate, and certainly no evidence, that a specialty manufacturing line could ever be switched over to brick production relatively promptly or at relatively modest cost. In similar circumstances, the Commission declined to find a "health and beauty aids" market when there was no evidence that the cosmetics manufacturers could "step up" to the more complex level of quality control and technology of the pharmaceutical manufacturers. *Sterling Drug Inc.*, 80 F.T.C. 477, 593-94 (1972).

regard specialty competition as sufficiently direct and substantial to take into account.⁴

In the absence of a record to support a finding of supply substitutability, I would not consider that there was a brick-specialty relevant market.

FINAL ORDER

This matter having been heard by the Commission upon the appeal of respondent from the initial decision, and upon briefs and oral argument in support thereof and in opposition thereto, and the Commission for the reasons stated in the accompanying Opinion having determined to sustain the initial decision with certain modification:

It is ordered, That the initial decision of the administrative law judge be adopted as the Findings of Fact and Conclusions of Law of the Commission, except to the extent indicated in the accompanying Opinion. Other Findings of Fact and Conclusions of Law of the Commission are contained in the accompanying Opinion.

It is further ordered, That the following order to cease and desist be, and it hereby is, entered:

I

It is ordered, That

Respondent Kaiser Aluminum and Chemical Corporation (hereinafter "Kaiser"), a corporation, and its officers, directors, agents, representatives, employees, subsidiaries, affiliates, successors, and assigns, shall divest all assets, title, properties, interests, rights and privileges [2] of whatever nature, tangible and intangible, including without limitation all real property, buildings, machinery, equipment, tools, raw materials, reserves, inventory, customer lists, trade names, patents, trademarks and other property of whatever description acquired by Kaiser as a result of its acquisition of the basic refractories segment of the Lavino Division of International Minerals & Chemicals Corporation (hereinafter "Lavino" and "IMC") together with all additions and improvements to said property which have been made subsequent to the acquisition. Such divestiture shall be absolute, shall be accomplished no later than one year from the

⁴ In several respects, the failure of proof situation with respect to the record here is like that in *Brown Shoe Co. v. United States*, 370 U.S. 294 (1962) where the Supreme Court rejected a government argument that there was an overall relevant product market of footwear (rather than separate mens, womens, and childrens shoes markets) because "the District Court made limited findings concerning the feasibility of interchanging equipment in the manufacture of non-rubber footwear." 370 U.S. at 325 n. 42.

effective date of this order, and shall be subject to the prior approval of the Federal Trade Commission.

II

The divestiture described in Paragraph I herein shall be accomplished absolutely to an acquiror and in a manner approved in advance by the Federal Trade Commission so as to transfer Lavino as an ongoing business and a viable, competitive, independent concern.

III

Pending divestiture, no substantial property or other asset referred to in Paragraph I herein shall be sold, leased, otherwise disposed of or incumbered, other than in the normal course of business, without the consent of the Federal Trade Commission.

IV

No individual employed by the new owner of the divested assets and engaged in research, manufacture or sale of basic refractories at any time during the period beginning on the date of the divestiture specified in Paragraph I herein and extending for three years, shall be hired by Kaiser without the consent of the Federal Trade Commission.

V

Pending any divestiture required by this order, Kaiser shall not allow the deterioration of the property specified in Paragraph I in a manner that impairs the marketability of the business. [3]

VI

Pursuant to the requirements of Paragraph I, none of the property or business acquired or added by Kaiser shall be divested to anyone who is an officer, director, employee or agent of Kaiser or is in any other way controlled or influenced by Kaiser, or to anyone who owns or controls, directly or indirectly, more than one percent of the outstanding shares of the capital stock of Kaiser or to anyone who is not approved in advance by the Federal Trade Commission.

VII

For a period of ten (10) years from the date this order becomes final, Kaiser shall cease and desist from acquiring or acquiring and

holding directly or indirectly, through subsidiaries or otherwise, without the prior approval of the Federal Trade Commission, the whole or any part of the stock, share capital or assets, or any other interest in any company engaged in the business of manufacturing, distributing, or selling basic refractories in or to the United States.

VIII

Kaiser shall provide upon request of the purchaser, without charge, the use of all know-how, patents, and trade secrets developed by the Kaiser Refractories Division's basic refractories research and development staff from the time of the acquisition by Kaiser of the Lavino assets to six months after the date that Lavino has established a staff for research and development as described in Paragraph X, provided that this period shall not extend beyond the period of eighteen (18) months from the date of the divestiture specified in Paragraph I.

IX

For a period of three years from the date of the divestiture described in Paragraph I, if requested by the purchaser for its own use, Kaiser shall provide such amounts and grades of magnesia as are requested, with the maximum amounts, grades and prices to the purchaser limited to that receivable by Kaiser under the supply contract (or any renewal pursuant thereto) obtained by Kaiser from Harbison-Walker in the acquisition of the Lavino assets. Kaiser shall provide the purchaser reasonable access to documents sufficient to allow the purchaser to determine whether Kaiser is in compliance with the provisions of this paragraph. [4]

X

For a period of one year from the date of the divestiture described in Paragraph I, Kaiser shall, if requested by the purchaser, without charge, in good faith, assist the purchaser in hiring and training a staff for research and development and for sales of basic refractories. Kaiser shall, in this regard, pay the expense of obtaining, through an employment agency picked by the purchaser, competent, technically trained, basic refractories salesmen and research and development scientists, and their supervisors. The number of such personnel shall not exceed the number employed by Lavino on November 9, 1973.

XI

At the time of the divestiture required by this order, Kaiser shall

make available to the purchaser of the property and business, a list of all of Kaiser's customers for basic refractories products who have purchased said products from respondent within three years prior to the divestiture.

XII

Any dispute between Kaiser and the purchaser arising under Paragraphs VIII-XI of this order shall be resolved at the option of either Kaiser or the purchaser pursuant to the Commercial Arbitration Rules and the procedures of the American Arbitration Association. If arbitration is invoked by either party, such arbitration shall be exclusive and in lieu of any other common law rights. The arbitrator shall be selected by the parties from the panel of arbitrators of the American Arbitration Association or by the Federal Trade Commission in the event that the parties are unable to agree; said arbitrator shall be empowered to determine the merits of any dispute arising under Paragraphs VIII-XI of this order, and assess the costs of arbitration; the decision of said arbitrator shall be final and binding upon the parties and judgment thereon may be entered in any court of competent jurisdiction. Arbitration shall be no cause for delay; and in the event of a default by either party in appearing before the arbitrator, pursuant to advance written notice, the arbitrator is authorized to render a decision upon the testimony of the party appearing.

XIII

One year from the effective date of this order, and [5] on the anniversary date of each year thereafter until the expiration of the prohibitions in Paragraph VII of this order, Kaiser shall submit a report in writing to the Federal Trade Commission listing all acquisitions, mergers, and agreements to acquire or merge made by Kaiser relating in any way to the production or sale of basic refractories; the date of each such acquisition, merger or agreement; the products involved and such additional information as may from time to time be required.

XIV

Within thirty days from the effective date of this order and every sixty days thereafter until it has fully complied with Paragraph I of this order, Kaiser shall submit a verified report in writing to the Federal Trade Commission setting forth in detail the manner and form in which it intends to comply, is complying or has complied

therewith. All such reports shall include in addition to such other information and documentation as may hereafter be requested: (a) a specification of the steps taken by Kaiser to make public its desire to divest Lavino; (b) a list of all persons or organizations to whom notice of divestiture has been given; (c) a summary of all discussions and negotiations together with the identity and address of all interested persons or organizations, and (d) copies of all reports, internal memoranda, offers, counteroffers, communications and correspondence concerning said divestiture.

XV

Kaiser shall notify the Commission at least thirty days prior to any proposed changes by it which may affect compliance obligations arising out of this order.

FEDERAL TRADE COMMISSION DECISIONS

Complaint

93 F.T.C.

IN THE MATTER OF
GENERAL MOTORS CORPORATION

CONSENT ORDER, ETC., IN REGARD TO ALLEGED VIOLATION OF
THE FEDERAL TRADE COMMISSION ACT

Docket C-2966. Complaint, May 18, 1979 — Decision, May 18, 1979

This consent order, among other things, requires a Detroit, Mich. motor vehicle manufacturer to cease misrepresenting the manufacturing source of engine options and the availability of standard or optional equipment. The order also requires the firm to make designated disclosures regarding the manufacturing source, ordering code, and availability of each engine option offered for the model years 1979 through 1981; notify dealers promptly of engine option substitutions; and provide them with the replacement parts and maintenance information necessary to service such equipment. Additionally, the company would be prohibited from using any wholesale order system which could prevent dealers from designating specific options requested by purchasers.

Appearances

For the Commission: *Sharon J. Devine, William W. Jacobs and John M. Mendenhall.*

For the respondent: *Robert C. Weinbaum, Detroit, Mich. and Richard W. Pogue, Jones, Day, Reavis & Pogue, Cleveland, Ohio.*

COMPLAINT

The Federal Trade Commission, having reason to believe that respondent General Motors Corporation, a corporation, has violated the provisions of Section 5 of the Federal Trade Commission Act and that a proceeding by it in respect thereof would be in the public interest, issues this complaint:

PARAGRAPH 1. Respondent, General Motors Corporation, is a corporation organized, existing and doing business under and by virtue of the laws of the State of Delaware, with its principal office and place of business located at 3044 West Grand Boulevard, Detroit, Michigan.

PAR. 2. Respondent is now and has been, engaged in the manufacture, distribution, sale, promotion and advertising of various products including passenger cars.

PAR. 3. Respondent maintains, and at all times mentioned herein is maintained, a substantial course of trade in said products in or affecting commerce, as "commerce" is defined in the Federal Trade Commission Act.