

# **HALCINED BAUXITE PROPPANTS FROM AUSTRALIA**

Determination of the Commission in  
Investigation No. 731-TA-411  
(Final) Under the Tariff Act  
of 1930, Together With the  
Information Obtained in the  
Investigation

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United States International Trade Commission  
Washington, DC 20436

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Note.--Information that would reveal confidential operations of individual firms may not be published and therefore has been deleted from this report. Deletions are indicated by asterisks.

UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-411 (Final)

CALCINED BAUXITE PROPPANTS FROM AUSTRALIA

Determination

On the basis of the record 1/ developed in the subject investigation, the Commission determines, 2/ pursuant to section 735(b) of the Tariff Act of 1930 (19 U.S.C. § 1673d(b)) (the act), that an industry in the United States is not materially injured or threatened with material injury, and the establishment of an industry in the United States is not materially retarded, by reason of imports from Australia of calcined bauxite proppants, provided for in heading 2606 (and covered by statistical reporting number 2606.00.0060) of the Harmonized Tariff Schedule of the United States, 3/ that have been found by the Department of Commerce to be sold in the United States at less than fair value (LTFV).

Background

The Commission instituted this investigation effective November 29, 1988, following a preliminary determination by the Department of Commerce that imports of calcined bauxite proppants from Australia were being sold at LTFV within the meaning of section 731 of the act (19 U.S.C. § 1673). Notice of the institution of the Commission's investigation and of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC,

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1/ The record is defined in sec. 207.2(h) of the Commission's Rules of Practice and Procedure (19 CFR § 207.2(h)).

2/ Commissioner Cass not participating.

3/ Until Jan. 1, 1989, calcined bauxite proppants were provided for in item 521.1720 of the Tariff Schedules of the United States Annotated.

and by publishing the notice in the Federal Register of December 28, 1988 (53 F.R. 52512). The hearing was held in Washington, DC, on February 22, 1989, and all persons who requested the opportunity were permitted to appear in person or by counsel.



## VIEWS OF THE COMMISSION

We unanimously 1/ determine that an industry in the United States is not materially injured or threatened with material injury by reason of imports of calcined bauxite proppants from Australia that are sold at less than fair value (LTFV). 2/

# I. Like Product

In determining whether a domestic industry is materially injured or is threatened with material injury by reason of the subject imports, we must, as a threshold matter in a title VII investigation, define the relevant domestic industry. Section 771(4)(A) of the Tariff Act of 1930 defines the domestic industry as the "domestic producers as a whole of a like product, or those producers whose collective output of the like product constitutes a major proportion of the total domestic production of that product." 3/ Correspondingly, "like product" is defined as "[a] product that is like, or in the absence of like, most similar in characteristics and uses with, the articles subject to investigation." 4/

Our decision regarding the appropriate like product(s) in an investigation is essentially a factual determination, and we have applied the statutory standard of "like" or "most similar in characteristics and uses" on a case-by-case basis. 5/ In analyzing like product issues, we

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1/ Commissioner Cass did not participate in this determination. Had he voted, he would have joined the majority in its negative determination. He would not necessarily have joined in the views it expresses herein.

2/ Material retardation is not an issue in this investigation, and will not be discussed further.

3/ 19 U.S.C. § 1677(4)(A).

4/ 19 U.S.C. § 1677(10).

5/ Asociacion Colombiana de Exportadores de Flores, et. al. v. United States ("ASOCOFLORES"), \_\_ CIT \_\_, Slip. Op. 88-91 at 9 (July 14, 1988).

generally examine such factors as: (1) physical characteristics, (2) end uses, (3) interchangeability of the products, (4) channels of distribution, (5) production processes, (6) customer or producer perceptions, (7) common manufacturing facilities and production employees, and (8) price. 6/ No single factor is dispositive, and we may consider other factors which we deem relevant based upon the facts of a given investigation. 7/

In the preliminary investigation, we determined that there was one like product, calcined bauxite proppants, exclusive of other proppants and regardless of strength, size, or coating, and one domestic industry consisting of the domestic producers of that product. 8/ In this final investigation, petitioner supports and no party challenges those preliminary determinations. We have found no reason in this final investigation to change our like product and domestic industry determinations. We therefore find that domestically produced calcined bauxite proppants constitute a single like product corresponding to the

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6/ Light-Duty Integrated Hydrostatic Transmissions and Subassemblies Thereof, With or Without Attached Axles, from Japan, Inv. No. 731-TA-425 (Preliminary), USITC Pub. No. 2149 (Jan. 1989); Certain Forged Steel Crankshafts from the Federal Republic of Germany and the United Kingdom, Invs. Nos. 731-TA-351 and 353 (Final), USITC Pub. 2014 (Sept. 1987); ASOCOFLORES at 12, n.8.

7/ In its notice of initiation of investigation, the Department of Commerce defined the scope of the investigation:

The product covered by this investigation is calcined bauxite proppants from Australia currently provided for under TSUSA item number 521.1720 and currently classifiable under HS item number 2606.00.00.60. The subject merchandise is used in oil and gas wells to cause hydraulic fracturing to promote product extraction.

53 Fed. Reg. 26299 (July 12, 1988).

8/ Calcined Bauxite Proppants from Australia, Inv. No. 731-TA-411 (Preliminary), USITC Pub. 2100 at 6 (July 1988).

subject imports from Australia, and that the domestic industry consists of the domestic producers of calcined bauxite proppants. 9/

Condition of the Domestic Industry 10/

Pursuant to 19 U.S.C. § 1677(7)(C)(iii), in assessing the condition of the domestic industry, we consider, among other factors, domestic consumption, production, capacity, capacity utilization, shipments, inventories, employment, and financial performance. For the purposes of this final investigation we considered full-year data for the period of 1985 through 1987 and data for the interim period of January–October 1988 as compared with the same period in 1987. The performance indicators of the domestic industry generally showed declines in the early part of the period of investigation; however, the condition of the industry improved substantially in the latter part of the period, especially in interim 1988 as compared to interim 1987.

Drilling activity declined with the collapse of oil and gas prices in 1985–1986, lowering the demand for proppants used in hydraulic fracturing. Due to various factors, however, demand recovered during 1987–1988. 11/

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9/ In the preliminary opinion, a question was raised as to respondent's contention that resin-coated sand should be included in the like product. As we stated in our preliminary determination, there are differences between calcined bauxite proppants and resin-coated sand in chemical composition (bauxite versus quartz), conductivity, production process (mining and resining of sand versus calcination of bauxite), production lines and workers, possible uses (resin-coated sand has significant applications outside the proppant market), and price. USITC Pub. 2100 at 5, n.8; see also Report to the Commission (Report) at A-7-10, A-14-15. Accordingly, we find that resin-coated sand is not part of the like product in this investigation.

10/ The domestic industry is comprised of two firms, Carbo Ceramics and Norton-Alcoa; therefore, much of the aggregate data concerning these firms is confidential and is discussed herein only in general terms.

11/ Such factors included increased use of man-made proppants instead of sand; increased concentration of proppants per cubic foot; increased  
(continued...)

U.S. apparent consumption based on quantity, which declined from 1985 to 1986, recovered in 1987 and rose again in interim 1988 as compared with interim 1987. 12/

Domestic production of calcined bauxite proppants also declined from 1985 to 1986, and recovered in 1987; production rose further from interim 1987 to interim 1988. Capacity remained stable during most of the period of investigation. Capacity utilization followed the same trend as production, although it remained at a relatively low level. 13/ U.S. producers' domestic shipments generally paralleled the trends in production and consumption. Total shipments by quantity dropped from 1985 to 1986, but increased in 1987 and in interim 1988. Inventories remained relatively stable throughout the period of investigation. 14/ The number of employees and hours worked declined from 1985 through 1987 and rose in the 1988 interim. Hourly wages and productivity generally increased throughout the period of investigation. 15/

The financial performance of the domestic industry declined from 1985 to 1986, rose in 1987, and improved noticeably in interim 1988 as compared with interim 1987. Net sales declined from 1985 to 1986; however, net sales increased thereafter. Outlays for research and development, which remained low for much of the period of investigation after 1985, rose significantly in interim 1988. 16/

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11/(...continued)

drilling activity in remedial wells that may have been inactive for years; and increase in the recommended height of closure stress levels. Report at A-19.

12/ Id.

13/ Id. at A-20, Table 8.

14/ Id. at A-20-21.

15/ Id. at A-22.

16/ Id. at A-23-24.

In view of the the general improvement in the condition of the domestic industry since 1986 and, in particular, the industry's improved financial situation as well as significant increases in production, domestic shipments, exports, and net sales in interim 1988, we conclude that the domestic calcined bauxite proppants industry is not experiencing material injury. 17/

No Material Injury by Reason of LTFV Imports

In considering whether the domestic industry is materially injured by reason of LTFV imports, we consider the volume of imports, the effect of such imports on prices, and the impact of such imports on the domestic industry. 18/ We do not weigh causes of material injury. 19/ However, we are to consider information that indicates that harm is caused by factors other than the LTFV imports, such as a contraction in demand, changes in patterns of consumption, or restrictive practices of and competition between the foreign and domestic producers. 20/

We did not find in the preliminary investigation that there was a reasonable indication of material injury by reason of the subject imports. Since that time, no new information has arisen to show a causal link

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17/ Acting Chairman Brunsdale does not reach a separate legal conclusion based on the condition of the domestic industry. She believes that the discussion of the domestic industry is accurate and relevant to her decision on the existence of material injury by reason of dumped imports. Notwithstanding the recent improvements in industry condition, however, she notes that the industry is still in a relatively depressed state.

18/ 19 U.S.C. § 1677(7)(B).

19/ Commissioner Eckes also notes that the imports need not be a principal, a substantial, or a significant cause of material injury. S. Rep. No. 247, 96th Cong., 1st Sess. 74 (1979).

20/ See S. Rep. No. 249, 96th Cong., 1st Sess. at 74-75 (1979); H.R. Rep. No. 317, 96th Cong., 1st Sess. 46-47 (1979).

between the subject imports and any material injury that the domestic industry might be suffering.

The share of the U.S. market accounted for by LTFV imports was small in 1985-1986. The subject imports increased in 1987 but to a level below that in 1985. Although the subject imports increased their market share in interim 1988, that share remained small. More significantly, this increase occurred at a time when the condition of the domestic industry showed its strongest improvement; the major decline in the condition of the domestic industry occurred in 1985-1986, when imports were fewer or nonexistent. 21/

Domestic prices declined during 1985-1986; however, prices rose during the latter part of the period of investigation, when imports increased to their highest level. Although imports sold at lower prices than did domestic product, 22/ the evidence on the record does not suggest that this has suppressed or depressed domestic prices. 23/ At the Commission hearing, petitioner stated that price declines were due to competition among domestic producers and surplus capacity, and not to imports. 24/ Thus, we conclude that imports have had no depressive or suppressive effect on domestic prices.

We find, upon consideration of the entire record in this investigation, that the domestic industry has not experienced material injury by reason of LTFV imports.

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21/ Report at A-28. See above for discussion of the domestic industry's condition

22/ We note that price comparisons are complicated in this case by factors such as the Exxon royalty and the fact that proppants are sold by weight and used by volume. Report at A-29.

23/ Report at A-31-32, Table 23.

24/ Tr. at 28. Petitioner later stated, in its posthearing brief at 14, that imports have depressed U.S. prices, but cited for this proposition only the prehearing staff report and the staff elasticity memorandum, neither of which indicate that imports have had a depressive effect on prices.

### No Threat of Material Injury

In determining whether a U.S. industry is threatened with material injury, the Commission is to consider, among other factors, the following factors:

- (1) if a subsidy is involved, information that the Commission has available to it as to the nature of the subsidy;
- (2) the ability and likelihood of the foreign producers to increase the level of exports to the United States due to increased production capacity or unused capacity;
- (3) any rapid increase in penetration of the U.S. market by imports and the likelihood that the penetration will increase to injurious levels;
- (4) the probability that imports of the merchandise will enter the United States at prices that will have a depressing or suppressing effect on domestic prices of the merchandise;
- (5) any substantial increase in inventories of the merchandise in the United States;
- (6) underutilized capacity for producing the merchandise in the exporting country;
- (7) any other demonstrable adverse trends that indicate the probability that importation of the merchandise will be the cause of material injury;
- (8) the potential for product shifting; 25/

The Commission's determination of threat may not be made on the basis of mere conjecture or supposition, but must be made on the basis of evidence that the threat of material injury is real and that actual injury is imminent. 26/

In the preliminary determination, we found a reasonable indication that the domestic calcined bauxite proppants industry was threatened with

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25/ 19 U.S.C. § 1677(7)(F). There is no potential for product shifting in this case.

26/ 19 U.S.C. § 1677(7)(F)(ii); see Citrosuco Paulista v. United States, Slip. Op. 88-176 (CIT Dec. 30, 1988).

material injury. That determination was based on an increase in import market share and the existence of significant inventories of Australian product both in the United States and Australia, and we noted that imports undersold the domestic product at a time of declining domestic prices. 27/ The determination was not based on the existence of unused foreign capacity, because as we noted the foreign producer's operation was apparently closed.

In this final investigation, the record shows that the sole Australian producer Comalco's plant is still shut down, and that it will likely remain so. Comalco states, and independent industry sources via the State Department confirm, that its production of calcined bauxite proppants has ceased and some plant machinery has been dismantled. 28/ Comalco has provided a detailed list of costly and expensive steps it would need to take before it could resume production of calcined bauxite proppants. 29/ Comalco clearly has no present capacity to produce calcined bauxite proppants, and there is no information to suggest that it will acquire such capacity in the near future. On the contrary, the continuing lack of demand for high strength proppants gives Comalco little incentive to restart its production.

In the preliminary investigation, we found that there were significant inventories of Australian product both in the U.S. and Australia. Since that time, inventories in Australia have declined significantly in part due to imports into the U.S. 30/ Consequently, although significant quantities

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27/ USITC Pub. 2100 at 10-11.

28/ Report at A-26.

29/ Id. at A-26-27.

30/ Id. at A-27-28.



of inventories of imports remain in the U.S., there is little prospect for further importation. 31/ Moreover, a large part of the remaining U.S. inventory is already under contract to TransAmerican Natural Gas Corp., and will likely be taken by that company. 32/

As discussed above, we find that imports have had no depressive or suppressive effect on domestic prices. Similarly, there is little likelihood that future imports will have such an effect.

We determine that the domestic calcined bauxite proppants industry is not threatened with material injury by reason of LTFV imports.

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31/ Id. at A-27.

32/ Id. at A-27-28.



## INFORMATION OBTAINED IN THE INVESTIGATION

## Introduction

Following a preliminary determination by the U.S. Department of Commerce (53 F.R. 47842, Nov. 28, 1988) that imports from Australia of calcined bauxite proppants, currently provided for in heading 2606 (and covered by statistical reporting number 2606.00.0060) of the Harmonized Tariff Schedule of the United States (HTS), 1/ are being, or are likely to be, sold in the United States at less than fair value (LTFV), the U.S. International Trade Commission, effective November 29, 1988, instituted investigation No. 731-TA-411 (Final) under section 735(b) of the Tariff Act of 1930 (the Act) to determine whether an industry in the United States is materially injured, or is threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of imports of such merchandise into the United States.

Notice of the institution of the Commission's investigation and, of a public hearing to be held in connection therewith was given by posting copies of the notice in the Office of the Secretary, U.S. International Trade Commission, Washington, DC, and by publishing the notice in the Federal Register of December 28, 1988 (53 F.R. 52512).

On February 9, 1989, Commerce published in the Federal Register (54 F.R. 6311) its final affirmative determination that imports of calcined bauxite proppants from Australia are being, or are likely to be sold in the United States at LTFV. 2/

A public hearing was held in connection with the investigation on February 22, 1989, in Washington, DC. 3/ The Commission voted 4/ on this investigation on March 21, 1989.

## Background

This investigation results from a petition filed by Carbo Ceramics, Inc., Irving, TX, on June 14, 1988, alleging that an industry in the United States is materially injured and threatened with material injury by reason of LTFV imports of calcined bauxite proppants from Australia. In response to that petition, the Commission instituted investigation No. 731-TA-411 (Preliminary) under section 733 of the Tariff Act of 1930 (19 U.S.C. § 1673b(a)) and, on July 29, 1988, determined that there was a reasonable indication that an industry in the United States was materially injured or threatened with material injury by reason of imports of the subject merchandise. 5/

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1/ Until Jan. 1, 1989, calcined bauxite proppants were provided for in item 521.1720 of the Tariff Schedules of the United States Annotated.

2/ Copies of the Commission's and Commerce's notices are presented in app. A.

3/ A list of the witnesses appearing at the hearing is presented in app. B.

4/ Commissioner Cass did not participate.

5/ Commissioner Liebelier is no longer with the Commission, and Commissioner Newquist was not a member of the Commission at that time.

## The Product

Description and uses

Calcined bauxite proppants are fine, dense, intermediate- to high-strength, spherical pellets used by the petroleum industry to increase oil and gas recovery from hydraulically fractured wells. Calcined bauxite proppants are used in the completion of difficult wells (a "good" well does not require hydraulic fracturing). Petitioner testified at the hearing that approximately 75 to 80 percent of its calcined bauxite proppants are used in new wells and 20 to 25 percent are used in recompletions (workovers). Almost all of its calcined bauxite proppants are used in gas wells. 1/

Since the 1940s, hydraulic fracturing has been used as a technique for increasing production from hydrocarbon reservoirs. The hydraulic fracturing operation involves pumping a fluid (usually a high-viscosity water-based gel) at high rates and high pressures (often greater than 10,000 pounds per square inch (psi)) into the rock formation. The fracture is usually vertical in wells deeper than 5,000 feet, and is typically 500 to 1,500 feet long, 50 to 100 feet high, and one-tenth of an inch wide. 2/

The purpose of creating the fracture is to provide a permeable pathway through which oil and/or gas can flow. In order to maximize flow through the fracture, a proppant (which "props" open the fracture) is added to the gelled fracturing fluid. After the fracture is generated, the well is shut in and the gelled fluid is allowed to break (viscosity decreases) and the formation closes against the proppant pack. With proper design, oil and gas will then flow through the proppant in the fracture much more easily than through the original formation, resulting in a production rate increase. 3/

History.--When hydraulic fracturing began in the late 1940s, it was discovered that production increases were prolonged if propping agents were used to hold the fractures open. One of the first proppants used was sand. Novelties such as iron shot, high-strength quenched glass beads, round walnut shells, aluminum pellets, and plastic beads were manufactured in the 1960s to give the industry a vast array of high-strength proppants. As deeper wells were drilled in the early 1970s, the shortcomings of glass and quartz became apparent (both are relatively soluble in hot-formation brines and tend to fail catastrophically under high-closure stress). This led oil and gas production companies to undertake extensive research that resulted in the development of high-strength sintered bauxite proppants. 4/

Product descriptions.--The three general types of proppants currently being used in hydraulic fracturing are sand, resin-coated sand, and bauxite proppants. Current market shares for each of these proppants as a percent of the total proppant market, and list prices, as estimated by industry sources, are presented in the following tabulation:

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1/ Transcript of the hearing (TR), pp. 16-17.

2/ "An Overview of the Use of Proppants in Hydraulic Fracturing," Carbo Ceramics, Inc., pamphlet, August 1987.

3/ For example, the permeability of an intermediate-strength bauxite proppant (20/40 Carbo-Prop HC) at 5,000 psi closure stress is greater than 500 darcy (a measure of flow through a static bed), while a prolific oil-bearing formation may have a permeability of 0.05 darcy, and many gas-producing formations have permeabilities less than 0.001 darcy. (Ibid., p. 2).

4/ Proppants, Western Co. pamphlet, 1984, p. 1.

<u>Proppant type</u>	<u>Share</u> <u>(percent)</u>	<u>Price</u> <u>(per pound)</u>
Frac sand.....	90.0	\$0.06
Resin-coated sand.....	***	.35
Bauxite.....	***	.60-0.75
Total.....	100.0	

Frac sands.--Sand, commonly used in shallow wells, is by far the most widely used proppant, as it is the least expensive at approximately 6 cents per pound. At greater depths the increasing pressure causes the sand grains to crush, reducing permeability and therefore decreasing oil and gas recovery. Shallow wells are considered to be wells less than 8,000 feet deep. 1/

Resin-coated sands.--Resin-coated sands are commonly used in shallow to intermediate-depth wells and are available in two types, curable and pre-cured. 2/ Curable resin-coated proppants, such as AcFrac CR, manufactured by Acme Resin; and Super Sand, Super Sand HS, etc., sold by Santrol Products, are used in situations where the producing zone of the well will not retain an ordinary proppant. The resin coating bonds the proppant grains to each other and to the formation, thus preventing proppant flow-back (migration of the proppants back to the wellhead) and subsequent loss of productivity and damage to well equipment.

Pre-cured resin-coated sands, such as AcFrac PR, manufactured by Acme Resin, are frac sands coated with a phenolic resin and then heated to encapsulate the sand particle. As a result, the resin or plastic coating imparts additional strength to the sand grains by infilling imperfections in the grains, which increases the stress level the proppant can withstand before crushing. The resin also helps to contain sand crushed under high-closure stresses, thus preventing the migration of crushed material ("fines") during well production.

Bauxite proppants.--Bauxite proppants are commonly used in intermediate (8,000 to 15,000 feet) to deep wells (greater than 15,000 feet). 3/ The three general categories of bauxite proppants are low density/intermediate strength, intermediate strength, and high strength. Most of the categories contain a variety of trade names, with each product having slightly different performance characteristics.

Low density/intermediate-strength.--Carbo-Lite, manufactured by Carbo Ceramics, Inc., has a specific gravity and bulk density close to that of sand, but because it is more resistant to crushing, Carbo-Lite can be used in intermediate-depth wells up to closure stresses of 9,000 psi. 4/ As a result of the unique process of manufacturing, Carbo-Lite is different in appearance and, to some extent, different in physical properties from the intermediate-strength proppants.

Intermediate-strength.--Proppants such as Carbo-Prop HC (Carbo Ceramics), and Interprop I and Interprop Plus (Norton-Alcoa) are intermediate-

1/ TR, p. 17.

2/ TR, pp. 73-74, and Proppants, Western Petroleum Services.

3/ TR, p. 17.

4/ Technical Literature File, Carbo Ceramics, Inc., and TR, p. 23.

strength proppants used in wells ranging from 8,000 to 15,000 feet deep. 1/ These proppants exhibit greater strength than Carbo-Lite. For example, Carbo Ceramics recommends the use of Carbo-Prop HC for closure stresses ranging between 7,000 and 12,000 psi, whereas Carbo-Lite is recommended only up to 9,000 psi. 2/ These proppants are produced in four size ranges by manufacturing techniques similar to those used for high-strength bauxite. The difference between intermediate- and high-strength bauxite proppants lies primarily in the raw materials used. Intermediate-strength proppants are produced from bauxite ores that contain a significant amount of mullite (a less dense form of aluminum oxide than corundum) whereas high-strength bauxite proppants are produced from abrasive-grade bauxite ore that is primarily corundum, the purest form of bauxite.

High-strength---Proppants such as Dura-Prop (Comalco), Ultraprop I (Norton-Alcoa), and Sintered Bauxite HC (Carbo Ceramics) are considered high-strength proppants and are used in deep wells with very high-closure stresses and/or extremely severe downhole conditions such as high-temperature acidic environments. In contrast to the intermediate-strength bauxite proppants, high-strength proppants are composed primarily of corundum, which when sintered is one of the hardest minerals known, giving sintered bauxite proppants their excellent crush resistance.

Chemical characteristics--- Because of its strength and hardness characteristics, abrasive-grade calcined bauxite (AGB) is the principal raw material used in the production of intermediate- and high-strength bauxite proppants. Target properties of premium grade calcined AGB are-- 3/

High aluminum oxide ( $\text{Al}_2\text{O}_3$ ).....	Greater than 85%
Iron to silica ratio.....	2 to 1
Titania ( $\text{TiO}_2$ ) <u>1/</u> .....	Greater than 3%, less than 4%
Presence of fines.....	Minimum

1/ An oxide that increases toughness of alumina crystals.

A comparison of the typical chemical compositions of various proppants currently used in hydraulic fracturing is presented in table 1.

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1/ A third type of intermediate-strength proppant is ZirProp 126, which is manufactured by SPRE in France as a byproduct of the refractory industry from silica sands rich in zirconium oxide (Proppants, Halliburton Services, p. 11).

2/ Technical Literature File, Carbo Ceramics, Inc.

3/ Bauxite, "Proceedings of the 1984 Bauxite Symposium," p. 85.

Table 1  
Typical compositions of various proppants

(In percent)					
Item	Corundum <u>1/</u> (Al <sub>2</sub> O <sub>3</sub> )	Mullite (Al <sub>6</sub> Si <sub>2</sub> O <sub>13</sub> )	Cristo- balite (SiO <sub>2</sub> )	Amorphous phase <u>2/</u>	Quartz (SiO <sub>2</sub> )
Sand.....	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	98-100
Resin-coated sand <u>4/</u> ...	<u>3/</u>	<u>3/</u>	<u>3/</u>	<u>3/</u>	95-100
Bauxite:					
Low-density/inter- mediate-strength:					
Carbo-Lite.....	<u>3/</u>	52	27	21	<u>3/</u>
Intermediate-strength:					
InterProp Plus.....	39	54	<u>3/</u>	7	<u>3/</u>
Carbo-Prop HC.....	55-60	40-45	<u>3/</u>	<u>3/</u>	<u>3/</u>
High-strength: <u>5/</u>					
Dura-Prop.....	75	24	<u>3/</u>	<u>3/</u>	<u>3/</u>
Sintered Bauxite HC	77	22	<u>3/</u>	<u>3/</u>	<u>3/</u>

1/ A form of aluminum oxide, corundum is one of the hardest materials known to man and measures 9 on the Moh hardness scale; quartz measures 7, and diamond measures 10 (Proppants, Western Co. pamphlet, p. 2.).

2/ Non-crystalline.

3/ Not applicable.

4/ AcFrac PR, containing approximately 4 percent resin by weight.

5/ High-strength bauxite proppants that would fall under the Exxon use patent.

Source: Halliburton Services, Proppants, p. 4.

Physical properties.--A granular material must fulfill several conditions to be suitable for use as a propping agent. As described in industry literature, the primary physical properties that will affect fracture conductivity and ultimately well production are as follows (see table 2 for a comparative summary of physical data for various proppants): 1/

Proppant strength,  
Grain size,  
Grain-size distribution,  
Quality (amount of fines and impurities),  
Roundness and sphericity, and  
Proppant density (specific gravity).

Table 2  
Physical data for various 20/40 mesh proppants

Item	Acid solubility (percent)	Sphericity	Bulk density (lb/ft <sup>3</sup> )	Specific gravity
Sand.....	1.20	0.80	102.70	2.65
Resin-coated sand <u>1/</u> .....	1.20	0.90	100.40	2.56
<b>Bauxite:</b>				
Low density/intermediate-strength:				
Carbo-Lite.....	1.30	0.90	101.50	2.75
Intermediate-strength:				
InterProp Plus.....	3.20	0.90	113.50	3.25
Carbo-Prop HC.....	2.70	0.80	114.10	3.28
High-strength: <u>2/</u>				
Dura-Prop.....	1.80	0.80	135.00	3.74
Sintered Bauxite HC..	2.80	0.90	132.50	3.74

1/ AcFrac PR, containing 4 percent phenolic resin, by weight.

2/ High-strength bauxite proppants that would fall under the Exxon use patent.

Source: Halliburton Services, Proppants, p. 4.

Proppant strength.--When a hydraulic fracture is created, the closure stresses must be overcome to open and enlarge the fracture. These stresses, often referred to as "in-situ" stresses, try to close the fracture and crush the proppant. The selected proppant material must have high strength to avoid crushing when exposed to these stresses. The results of laboratory crush tests on various proppants are presented in table 3.

Grain size and grain-size distribution.--Proppants are available in mesh sizes of 16-20, 16-30, 20-30, 20-40, and 40-70. Proppants having larger proppant grain sizes (mesh size 16-20) provide a more permeable pack under low-

1/ Dowell Schlumberger, "Proppant selection guide," pp. 1-5.



Table 3  
Crush test results for various 20/40 mesh proppants

Item	(In percent)			
	Crushing test, crushed at--			
	7,500 psi	10,000 psi	12,500 psi	15,000 psi
Sand.....	1/	1/	1/	1/
Resin-coated sand 2/.....	1.20	3.70	8.80	13.30
<b>Bauxite:</b>				
Low density/intermediate-strength:				
Carbo-Lite.....	.92	6.80	10.60	24.00
Intermediate-strength:				
InterProp Plus.....	.24	.81	2.14	4.43
Carbo-Prop HC.....	.75	2.54	6.41	10.70
High-strength: 3/				
Dura-Prop.....	4.38	7.83	10.90	15.90
Sintered Bauxite HC...	1.03	2.30	4.11	8.79

1/ Not applicable.

2/ AcFrac PR, containing 4 percent resin, by weight.

3/ High-strength bauxite proppants which would fall under the Exxon use patent.

Source: Halliburton Services, Proppants, p. 4.

closure stress conditions. However, larger grain sizes can be more difficult to use in deeper wells because of greater susceptibility to crushing (as grain size increases, strength decreases) and placement problems (a wider fracture is required, and the settling rate of particles increases with increasing size). 1/

Quality--A higher percentage of smaller grains or impurities can have the same effect on the proppant-pack permeability as invading crushed materials.

Roundness and sphericity--Proppant grain roundness is a measure of the relative sharpness of grain corners, or of grain curvature. Particle sphericity is a measure of how close the proppant particle or grain approaches the shape of a sphere. Stresses in the proppant grains are more evenly distributed when the grains are round and about the same size; therefore, the grains will resist a higher load before grain failure occurs.

Proppant density--High-density proppants are more difficult to suspend in the fracturing fluid and to transport in the fracture. Placement can be achieved in two ways: (1) using high-viscosity fluids that carry the

1/ Approximately 80 percent of all proppants sold fall in the 20 to 40 sizing category, as this is the size that, because of physical constraints, most closely fits the opening of the fracture that is created in the earth.

proppant the length of the fracture with minimal settling; and (2) using low-viscosity fluids that require a higher flow velocity for proper placement in the fracture.

In addition to the physical properties of proppants mentioned above, there are a number of other factors that influence fracture conductivity. Fracture conductivity is also dependent upon proppant properties, closure stress, drawdown rate, formation properties (proppant embedment conditions), and resultant propped fracture widths. However, the choice between proppant types is based primarily on well conditions and economics.

Laboratory testing.--The American Petroleum Institute (API) recommends specifications and testing procedures for propping agents, which are the minimal standards accepted by the industry. 1/ In 1986, the majority of the proppant industry's suppliers and purchasers formed a consortium, and established Stim Lab, an independent testing laboratory, to undertake long-term testing of propping agents. The 25 consortium members include the 2 U.S. producers of the subject product, the Australian producer/exporter, U.S. suppliers of frac fluids, and the service companies.

Short-term (8 hours), in-house laboratory testing is continually being conducted by both producers and suppliers of calcined bauxite proppants. However, this short-term testing has its limitations. Industry references have indicated that laboratory measured proppant permeability data obtained from the API standardized test should be adjusted downward by 50 to 90 percent in order to be equivalent to in-situ permeabilities. 2/ Long-term (200 hours) testing data show a general trend of rapid conductivity decline during the first month followed by little or no decline during the remainder of the test (initial decline is the result of proppant consolidation and reorientation). 3/ The results of laboratory performance tests comparing various proppant products measuring conductivity are presented in figures 1 and 2.

Laboratory tests are but one tool used in measuring proppant performance. Industry sources have cautioned that proppant selection should be made after thorough evaluation of performance, which would also consist of the use of "decline curves" in conjunction with case histories, mathematical and econometric models, and post-frac analyses.

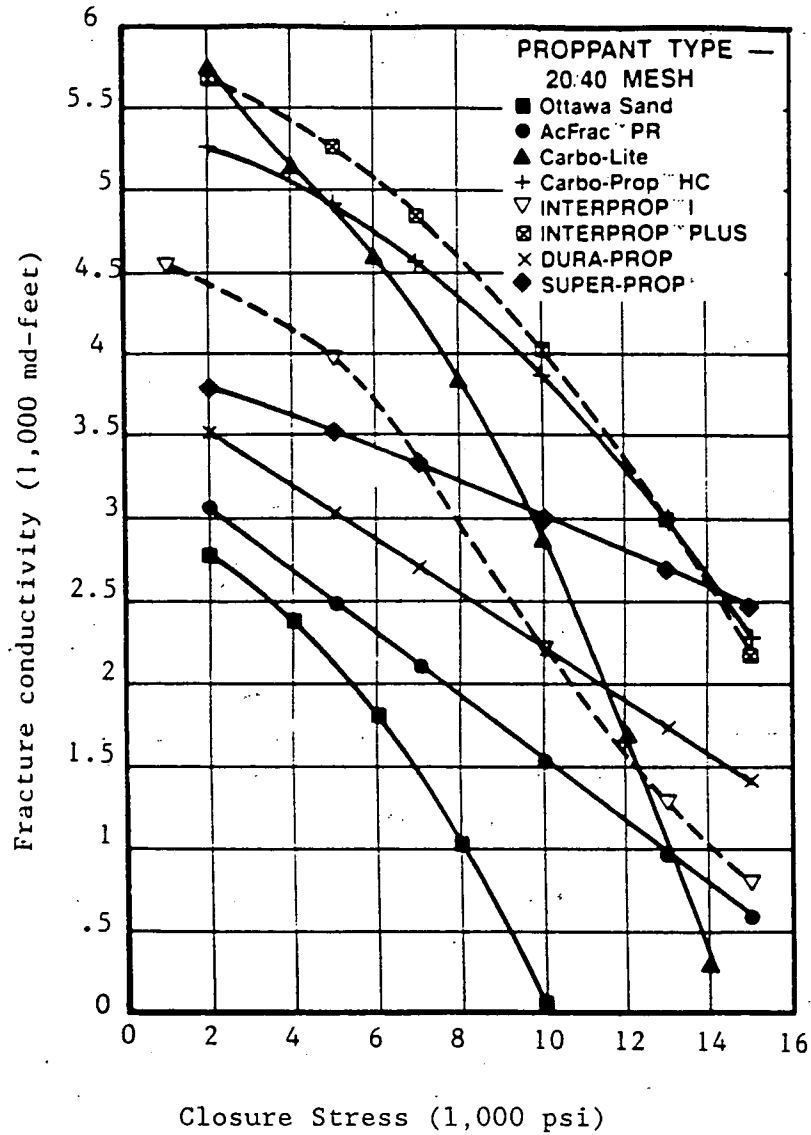
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1/ For example, API RP 56, "API recommended practices for testing high strength proppants used in hydraulic fracturing operations."

2/ This is done to account for field influences such as residual gel, embedment of the proppant into the formation, porosity blockage by fines, and other effects that are not measured using the standard laboratory testing equipment ("Overview," Carbo Ceramics pamphlet, p. 4).

3/ The magnitudes of decline are estimated at 20 percent in the first 2 weeks, followed by less than 5 percent in the remaining weeks. ("Evaluation of Long-term Proppant Stability," S.L. Cobb and J.J. Farrell, Society of Petroleum Engineers paper No. SPE 14133, p. 487).

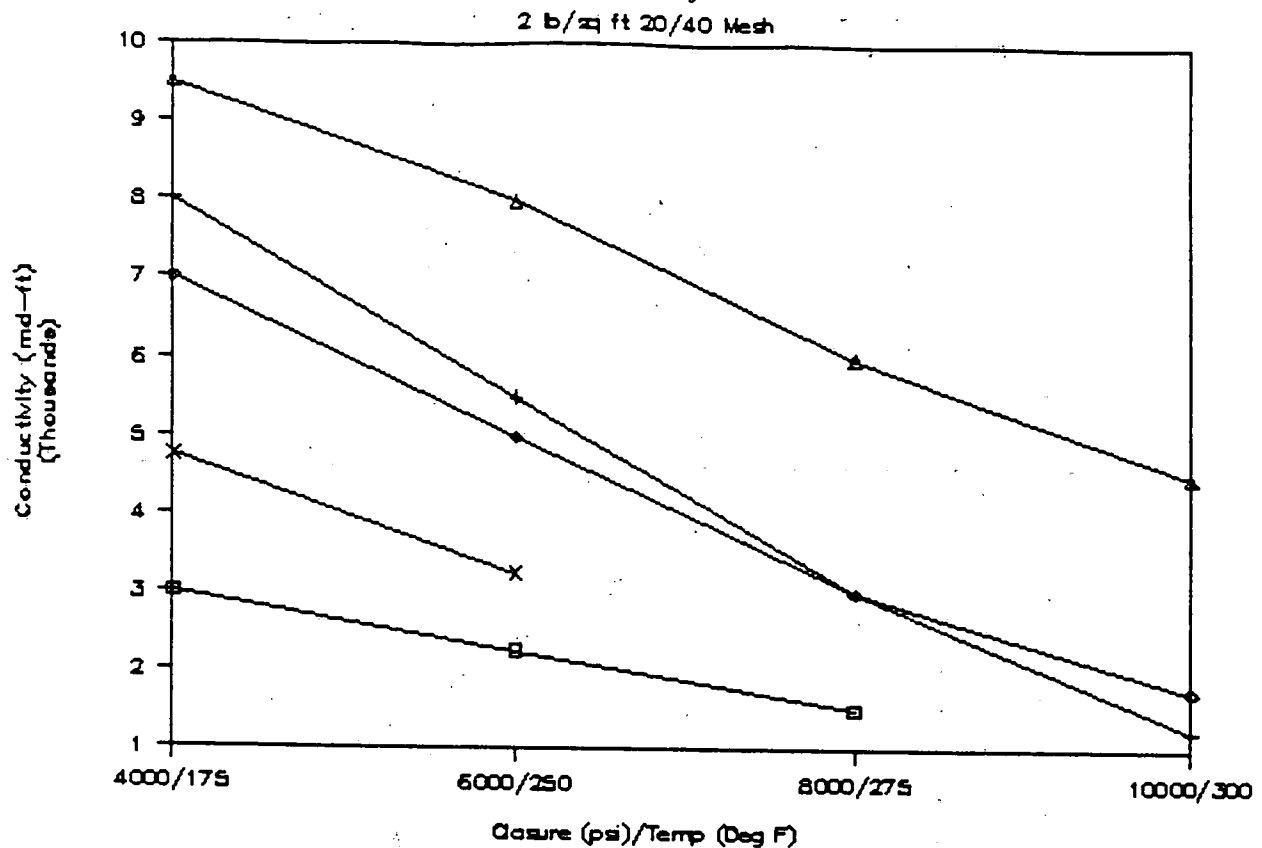
Figure 1.  
Comparative proppant conductivity data  
(2 lb/sq. ft.)



NOTE: Tests were conducted on a short-term basis (8 hours) using a radial flow test cell.

SOURCE: Halliburton Services, Proppants, p. 4.

Figure 2.  
Long-term proppant conductivity



□ AcFrac CR 1/ X Dura-Prop 2/ + Carbo-Lite ◊ InterProp Plus Δ Sintered Bauxite

1/ AcFrac CR was tested at constant 275 degree F to a recommended 8,000 psi level. Tests are currently being carried out to 10,000 psi.

2/ Dura-Prop tests were conducted using acidized Indiana Limestone, rather than the Ohio sandstone used with the other proppants tested. Nonetheless, Dura-Prop results have been plotted as an indication of relative order.

NOTE: Tests were conducted on a long-term basis (200 hours) using a linear flow test cell.

SOURCE: Stim Labs, "Final Report on the Investigation of the Effects of Fracturing Fluids upon Conductivity of Proppants", Jan. 18, 1988.

## Manufacturing Considerations

U.S. manufacturing processes

The relationship between proppants and their performance characteristics is partially dependent upon proppant microstructure, which is controlled by the raw materials and manufacturing processes. Along with intrinsic raw material chemistry, the manufacturing process defines proppant microstructural integrity, with particle size, distribution of phases in the final pellet microstructure, and porosity being controlled by the manufacturing process. For example, when using lower grade ores (lower alumina), finer ground powders will produce strengths similar to those of higher grade ores with coarser grinds because the finer grind will result in a more compact, stronger pellet. 1/ A review of the manufacturing processes used by proppant producers follows.

Frac sands.--These sands are produced by washing high-quality sand and sorting it into various size ranges. The two most common sands are Ottawa, mined primarily in Illinois and south central Minnesota, and Brady, mined in Texas. 2/

Resin-coated sand. 3/--Resin-coated sands are produced by coating high-quality frac sand grains with phenolic-type (plastic) resin. The pre-cured resin-coated variety is produced by heating the sand with an open flame (at approximately \*\*\* degrees F) and applying the phenolic resin coating, which gives the sand grains additional strength.

Bauxite proppants.--There are two basic methods used in the production of bauxite proppants. The low-density/intermediate-strength proppant (Carbo-Lite) is produced in a continuous operation utilizing a fluidized bed, whereas the intermediate-strength and high-strength proppants are produced using a semi-continuous process without the use of fluidized beds.

Low density/intermediate strength.--Carbo-Lite (Carbo Ceramics) is produced in Eufaula, AL, by a patented process utilizing a fluidized bed to form individual proppant particles. 4/ The raw materials, bauxitic clays mined locally in Alabama, enter the fluidized bed in the form of a slurry (raw materials mixed with water) which is sprayed onto a layer of partially dried bauxite "seed" particles. These seed particles, which consist of fine dust particles, are repeatedly coated with slurry in a stream of drying air. The particles grow in size while the size distribution of the particles is determined by the residency time in the fluidized bed. The semi-soft (green) pellets subsequently undergo a drying and sintering process in a kiln, which is accomplished by heating the pellets to a temperature around 2,700 degrees F. At this temperature the individual particles within each pellet fuse together,

1/ "Evaluation of Long-term Proppant Stability," S.L. Cobb and J.J. Farrell, Society of Petroleum Engineers paper No. SPE 14133, p. 484.

2/ Major frac sand producers include Badger Mining, Wedman Silica, and Uniman; these producers manufacture sand principally for use as abrasives in glass, sandblasting, and foundry industries (July 12, 1988, telephone conversation with \*\*\*).

3/ Resin-coated sand producers will also coat calcined bauxite proppants with resin to prevent proppant flowback. The bauxite proppant is supplied by the customer (service company) or the U.S. producer for a particular customer. Custom coating is \*\*\* of total operations. (Petitioner's postconference brief, p. 3; and Jan. 18, 1989, telephone conversation with \*\*\*).

4/ United States Patent 4,440,866, Apr. 3, 1984.

giving the pellet added strength. The proppants are then cooled, sized, and stored in silos to await shipment.

Intermediate- and high-strength.--Intermediate- and high-strength proppants can be produced by one of two methods depending upon the ore available. 1/ The manufacturing process employed in the United States by the two U.S. producers is similar and consists of the following five steps: milling, forming, drying, firing, and sizing.

In the production of Carbo Prop HC and Sintered Bauxite (Carbo Ceramics), as well as InterProp Plus and Ultraprop I (Norton-Alcoa), pellets must first be formed from bauxite ore. 2/ In the production process, bauxite ore is ground to a fine powder in a ball mill. The bauxite is then combined in mixers with a binding material and water in a batch-continuous process to form small wet pellets. These pellets are conveyed to a dryer to remove water and to a screen where the unwanted sizes are separated and returned for mixing. The semi-soft (green) pellets are then fired at about \*\*\* degrees F in a continuous operation to fuse the individual grains of the proppant together, causing the proppant to increase in hardness. The product is subsequently cooled, sized, and stored in storage tanks.

Both the intermediate- and high-strength proppants are produced by this process. The difference in the strength of the proppants is primarily a result of the chemistry of the raw materials used. As noted previously, in the production of intermediate-strength proppants, ores with a significant amount of mullite (a less dense form of aluminum oxide than corundum) in addition to corundum are used, whereas in the production of high-strength bauxite proppants, ore which is primarily corundum is used. 3/ The increase in the corundum content, the fineness of the grind, and the pelletizing operations, imparts added strength to the proppants.

#### Australian manufacturing process

Abrasive grade bauxite in Australia consists of naturally occurring spheres or "pisolites." Because it is a mined product, industry references have described the Australian Dura-Prop as being "produced by a process more similar to that of sand plants than that used to manufacture sintered bauxite proppants." 4/ During the preliminary investigation, counsel for Comalco provided a description of the manufacturing process used by the Australian

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1/ A third method of manufacturing is employed by the French in the production of ZirProp 126. During the manufacturing process, silica sands rich in zirconium oxide are heated to a molten state and then quickly cooled. Rapid cooling causes the individual grains to contract, thereby minimizing their surface area-to-volume ratio. The resulting product is an extremely smooth, round, blue-grey proppant (Proppants, Halliburton Services, p. 10).

2/ Carbo Ceramics primarily uses calcined bauxite ore imported from Comalco in Australia, TR, pp. 39-40. The raw materials account for approximately \*\*\* percent of its total cost of production. \*\*\*.

3/ Proppants, Halliburton Services, pp. 8-9.

4/ Ibid., p. 13.

producer before ceasing proppant operations; it consisted of four phases:

\*\*\*. 1/

\* \* \* \* \*

### Ceramic processing

The application of heat in the manufacturing of bauxite proppants creates a ceramic proppant, and provides for the following results:

- 1) Dried--drying at approximately 300° F to drive out free water;
- 2) Calcined--heating at approximately 800° F to drive out chemically held water; and
- 3) Sintered--firing at approximately 2,800° F to bring the product to 80 percent of its fusion (melting) point, maximizing the density of the crystal structure (a sintered proppant is twice as strong as a fused/melted proppant).

Sintered bauxite proppants are one of the few bauxite materials that have high strength in small particles. This characteristic is achieved by the controlled composition of very small crystals during the sintering process. These alpha alumina crystals are less than 12 microns in size and are in a random orientation so the microstructure is an interlocking intergrowth of crystals without continuous planes of weakness. The absence of the continuous shear planes in the sintered bauxite particles provides exceptional strength and resistance to crushing. 2/

### U.S. Tariff Treatment

U.S. imports of calcined bauxite proppants are classified in chapter 26 of the Harmonized Tariff Schedule of the United States (HTS) in heading 2606 (statistical reporting number 2606.00.0060), which covers "other" calcined bauxite. 3/ The subject products from Australia and other MFN sources are currently "Free" under the column 1-general rate of duty. 4/

1/ July 15, 1988, submission by Margaret Pfeiffer, counsel for Comalco in the preliminary investigation.

2/ "Sintered Bauxite Proppants for Deep Oil and Gas Well Stimulation," Stephen Crittenden, Society of Mining Engineers Preprint #83-132, p. 1.

3/ Abrasive-grade calcined bauxite is the major ingredient in abrasive products used for precision grinding, surfacing, and polishing metals. (Mineral Facts and Problems, Dept. of the Interior, 1985, p. 1.).

4/ The col. 1-general rates of duty are most-favored-nation (MFN) rates and are applicable to imported products from all countries except those Communist countries and areas enumerated in general note 3(b) of the HTS, unless preferential tariff treatment is sought and granted to eligible imports from enumerated countries.

## Nature and Extent of the LTFV Sales

On February 9, 1989, the Department of Commerce published in the Federal Register its final determination that imports of calcined bauxite proppants from Australia are being, or are likely to be, sold in the United States at LTFV. The period of Commerce's investigation for calcined bauxite proppants from Australia extends from January 1, 1988, through June 30, 1988.

For purposes of its final determination, Commerce compared the U.S. price, based on the best information available, with the foreign-market value, also based on the best information available because Comalco, the Australian producer/exporter, failed to submit an appropriate response to its questionnaire. Since Commerce did not have specific data as to quantities and prices of the subject merchandise sold in the United States, it used the packed U.S. price estimated by petitioner in the petition, minus deductions for foreign inland freight, ocean freight, marine insurance, and brokerage and handling charges. For the foreign-market value, Commerce used the constructed value calculated in the petition, which was based on the petitioner's manufacturing costs plus petitioner's general expenses and the statutorily mandated addition of 8 percent for profit. The estimated margin of sales at LTFV is 75.00 percent ad valorem.

Commerce also determined that critical circumstances do not exist with respect to imports of the subject product from Australia. Commerce directed the U.S. Customs Service to continue to suspend liquidation of all entries of calcined bauxite proppants from Australia that are entered, or withdrawn from warehouse, for consumption on or after November 28, 1988, the date of publication of its preliminary determination in the Federal Register.

Comalco proposed a suspension agreement to Commerce pursuant to section 734(b)(1) of the Act on the basis of cessation of exports. Commerce concluded that the suspension of this investigation would not be in the public interest, nor would effective monitoring of the proposed suspension agreement be practicable, within the meaning of section 734(d) of the Act.

## The U.S. Market

U.S. producers

There are currently two U.S. manufacturers of calcined bauxite proppants: Carbo Ceramics, Inc., Irving, TX; and Norton-Alcoa Proppants, Fort Smith, AR. Both firms are in support of the petition, and have responded to the Commission's questionnaires. <sup>1/</sup> The following tabulation shows their production levels for calcined bauxite proppants in 1987 and their shares of production (in percent):

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<sup>1/</sup> A third firm, General Abrasives (a division of Dresser Industries), was bought by Carbo Ceramics' predecessor company in April 1986.



<u>Company</u>	<u>Quantity</u> <u>(1,000 pounds)</u>	<u>Share</u> <u>(percent)</u>
Carbo Ceramics.....	***	***
Norton-Alcoa.....	***	***
Total.....	***	100.0

The petitioner, Carbo Ceramics, Inc., is a privately held company operating two proppant production plants at New Iberia, LA, and Eufaula, AL. Known as the Carborundum Co. when bauxite proppants first began to be produced in 1979, the petitioner has gone through a series of restructurings and mergers and has been known as Carbo Ceramics since June 30, 1987. <sup>1/</sup>

Norton-Alcoa Proppants is a partnership of Norton Proppants, a wholly owned subsidiary of Norton Co. and Alcoa Proppants, a wholly owned subsidiary of Aluminum Co. of America (Alcoa). The partnership was formed in January 1984, \*\*\*.

There are two U.S. firms that manufacture and/or sell resin-coated sand. These firms are Acme Resin Corp., Westchester, IL; and Santrol Products, Inc., Houston, TX. Both firms indicated that they are in support of the petition in their questionnaire responses and their data are presented in appendix C of the report. Acme Resin Corp. is a wholly owned subsidiary of Borden, Inc. It manufactures resin-coated sand principally for foundry industries. Approximately \*\*\* percent of Acme's production is pre-cured resin-coated sand.

Santrol Products, Inc., sells mostly curable resin-coated sand (\*\*) that is manufactured by \*\*. Santrol Products sells the product almost exclusively to the proppant industry under the following trade names: Super Sand, Super Sand X, Super HS, Super Sand 100, Tempered Super Sand, Tempered Super Sand X, and Custom Coating.

#### U.S. importers

Imported calcined bauxite proppants are included in a residual or so-called basket tariff category of abrasive-grade bauxite. The category includes calcined bauxite, other than refractory grade. Information identifying the importer and purchasers of imported calcined bauxite proppants <sup>2/</sup> was provided by the petitioner, and was verified against files provided by the U.S. Customs Service. The Commission sent two importer questionnaires and six purchaser questionnaires. One importer and four purchasers <sup>3/</sup> are believed to account for all imports and purchases of imports of calcined bauxite proppants from Australia during the period of investigation.

The importer of record for calcined bauxite proppants from Australia during the period of investigation was Treco Sales, a distributor of industrial

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<sup>1/</sup> In 1979 the petitioner was known as the Carborundum Co., a division of the Kennecott Co. \*\*\*.

<sup>2/</sup> \*\*\* imports of calcined bauxite proppants are from Australia.

<sup>3/</sup> \*\*\* was sent an importer and a purchaser questionnaire. \*\*\* responded to the Commission's purchaser questionnaire. \*\*\* responded to the Commission's end-user questionnaire (not the purchaser questionnaire) because \*\*\*. \*\*\*.

silica sands. TransAmerican Natural Gas Corp. (TANG), 1/ a gas drilling company, contracted to purchase 10 million pounds of calcined bauxite proppants from Comalco in May 1988. The shipment reached U.S. Customs in October and was liquidated in November; \*\*\*. 2/

The four U.S. purchasers, accounting for all purchases of imports during the period of investigation, provided usable data on their purchases of calcined bauxite proppants imported from Australia. The following tabulation presents information on their purchases of imports during January-October 1988, their locations, purchase levels, and each purchaser's share of total imports of calcined bauxite proppants:

<u>Purchaser</u>	<u>Location</u>	<u>Purchases of imports</u>		<u>Share (percent)</u>	
		<u>(1,000 lbs.)</u>	<u>(\$1,000)</u>	<u>(lbs.)</u>	
		*	*	*	*

#### Channels of distribution

Calcined bauxite proppant producers and importers ship the majority of the bauxite proppants to oil and gas industry service companies. The service companies for calcined bauxite proppants are the purchasers listed above (with the exception of \*\*\*).

In response to preliminary and final questionnaires, U.S. producers of calcined bauxite proppants and purchasers provided information on shipments of the subject products. These data are presented in table 4.

Table 4

Calcined bauxite proppants: Channels of distribution, 1985-87

\*   \*   \*   \*   \*   \*

Shipments of imports of the subject product were made exclusively to service companies during 1985 and 1987 (\*\*\*). However, during January-October 1988, sales and shipments of imports were begun to end users, accounting for \*\*\* percent of total purchases during that period (see the following tabulation:)

	<u>Quantity</u>	<u>Share</u>
	<u>(1,000 pounds)</u>	<u>(percent)</u>
Purchases of imports by--		
Service companies.....	***	***
End-users.....	***	***
Total.....	***	100.0

1/ \*\*\*.

2/ A copy of the contract is presented in app. D.

Market factors

Demand factors--The demand for calcined bauxite proppants is derived principally from the level of drilling activity in the oil and gas industry. Statistics on drilling activity <sup>1/</sup> and wellhead prices for oil and gas are presented in tables 5 and 6, and clearly indicate an oil and gas industry in decline during the period of investigation. Slightly increased activity in the number of gas wells drilled during January-September 1988, when compared with the corresponding period of 1987, is the only upward movement in indicators for the period of investigation.

Table 5

Drilling activity: Number of oil and gas wells drilled, by depth of well, 1980-88

(In thousands)									
Item	1980	1981	1982	1983	1984	1985	1986	1987	1988
Depth interval:									
Under 5,000 (feet)...	46.3	58.8	55.2	50.2	55.1	45.2	23.5	15.9	<sup>1/</sup>
5,000-9,999 (feet)...	18.1	23.9	20.5	17.8	22.1	18.9	10.5	8.1	<sup>1/</sup>
10,000-14,999 (feet)...	4.3	5.6	5.6	4.2	5.1	4.7	2.8	1.9	<sup>1/</sup>
15,000-over (feet)...	0.8	1.0	1.3	0.8	0.7	0.7	0.4	0.3	<sup>1/</sup>
Total (feet).....	69.5	89.3	82.6	73.0	83.0	69.5	37.2	26.2 <sup>2/</sup>	24.0

<sup>1/</sup> Not available.

<sup>2/</sup> Based on estimated 9-month average reported in official statistics of the U.S. Department of Energy.

Note.--Data include "dry" holes.

Source: American Petroleum Institute.

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<sup>1/</sup> Petitioner estimates that 25-30 percent of the wells drilled would require hydraulic fracturing, TR, p. 21.

Table 6

Wellhead prices of crude oil and natural gas, 1980-87, January-September 1987, and January-September 1988

Period	Crude oil		Natural gas	
	Price	No. wells	Price	No. wells
	Per barrel	Thousands	Per 1,000 cu ft	Thousands
1980.....	\$21.59	32.3	\$1.59	17.2
1981.....	31.77	42.8	1.98	19.9
1982.....	28.52	38.8	2.46	18.7
1983.....	26.19	36.8	2.59	14.3
1984.....	25.88	42.2	2.66	16.8
1985.....	24.09	34.6	2.51	14.1
1986.....	12.51	18.3	1.94	7.9
1987.....	15.41	15.9	1.67	7.6
January-September--				
1987.....	15.38	11.4	1.68	5.3
1988.....	13.26	11.1	1.65	5.5

Source: U.S. Department of Energy, Monthly Energy Review, September 1988.

Legal environment.--Supply and demand has been affected by the legal environment within the oil and gas drilling industry, which is governed by patents, trademarks, and secret manufacturing processes. Patents on processes and use of calcined bauxite proppants include:

<u>Patent name</u>	<u>Ownership</u>	<u>Description</u>
Colpoys 1/	Union Carbide	Use of all bauxite proppants
Cooke	Exxon	Use of sintered bauxite proppants
Fast 2/	Amoco	Hydraulic fracturing process
Fitzgibbons	Standard Ohio	Manufacturing of intermediate-strength proppants
Lunghofer	Carbo Ceramics	Manufacturing and use of low-density, intermediate-strength proppants

1/ Challenged by Exxon in 1978, and resulted in Union Carbide maintaining ownership of the patent but donating it to the public for use in the industry.

2/ Expired during the late 1950s.

Both the Cooke and Fitzgibbons patents have been the subject of litigation during the period of investigation.

Cooke patent.--On March 3, 1986, Exxon Production Research (EPR) filed suit against Halliburton Services, claiming infringement of the Cooke patent in the use of sintered bauxite proppants in deep wells. 1/ At issue was Halliburton's use of Comalco's Dura-Prop in a drilling operation in South Texas, and EPR's claim that Dura-Prop is a sintered bauxite proppant with a

1/ Although Halliburton was named in the suit as the "user" of the subject proppant, it had been indemnified by Comalco for \$\*\*\* to cover losses in the event of an adverse judgement. Comalco had agreed to indemnify all potential purchasers of its product pending the outcome of the litigation (June 27, 1988, telephone conversation with \*\*\*).

specific gravity of at least 3.6 used in a well greater than 7,500 feet, and, therefore, subject to the limitations of the Exxon use patent. On January 7, 1987, EPR and Halliburton reached an agreed decision, and a settlement agreement was arranged, whereby \*\*\*. 1/

Fitzgibbons patent.--During the fall of 1985, Norton-Alcoa initiated litigation against Standard Oil of Ohio seeking a declaratory judgement that the Fitzgibbons patent covering intermediate-strength proppants is invalid, unenforceable, and not infringed by Norton-Alcoa's products. Standard Oil filed a counterclaim charging infringement of its patent, and the case is still pending. 2/

#### Apparent U.S. consumption

Data on apparent U.S. consumption of calcined bauxite proppants have been obtained in response to Commission questionnaires and are shown in table 7.

Table 7

Calcined bauxite proppants: U.S. producers' domestic shipments, imports, and apparent consumption, 1985-87, January-October 1987, and January-October 1988

\*       \*       \*       \*       \*       \*

Trends in apparent consumption.--Total market sales of calcined bauxite proppants decreased from \*\*\* pounds in 1985 to \*\*\* pounds in 1986, or by \*\*\* percent, and then increased to \*\*\* pounds in 1987, or by \*\*\* percent. Sales of these proppants were \*\*\* pounds during January-October 1988, or \*\*\* percent greater than sales during the corresponding period of 1987.

Several factors are believed to have contributed to the increase in consumption of calcined bauxite proppants since 1986, despite statistical indicators showing a decline in drilling activity, including:

- Increased use of manmade proppants at the expense of sand proppants;
- Increased concentration of proppants per cubic foot;
- Increased drilling activity in remedial wells that may have been inactive for years; and
- Increase in the recommended height of closure stress levels.

U.S. producers' share of apparent consumption.--From 1985 to 1987, the U.S. producers' share of total apparent consumption of the subject calcined bauxite proppants increased irregularly from \*\*\* percent to \*\*\* percent. When compared with the corresponding period of 1987, the U.S. producers' share of total apparent consumption during January-October 1988 decreased by \*\*\* points to \*\*\* percent.

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1/ \*\*\*.

2/ \*\*\*.

### Consideration of Alleged Material Injury

The information in this section of the report was compiled from responses to questionnaires of the U.S. International Trade Commission. The two producers of calcined bauxite proppants that provided questionnaire responses are believed to account for all U.S. production of the subject product.

#### U.S. production, capacity, and capacity utilization

Data on reported U.S. production, end-of-period capacity, and capacity utilization of calcined bauxite proppants are presented in table 8. Production of all calcined bauxite proppants decreased from \*\*\* pounds in 1985 to \*\*\* pounds in 1986, or by \*\*\* percent. Production increased in 1987 to \*\*\* pounds, or by \*\*\* percent. During January-October 1988, production amounted to \*\*\* pounds, an increase of \*\*\* percent compared with the level of production in the corresponding period of 1987.

Table 8

Calcined bauxite proppants: U.S. production, end-of-period capacity, and capacity utilization, 1985-87, January-October 1987, and January-October 1988

\*       \*       \*       \*       \*       \*

Capacity utilization for all calcined bauxite proppants was \*\*\* percent in 1985, decreased to \*\*\* percent in 1986, and then increased to \*\*\* percent in 1987. During January-October 1988, the rate increased to \*\*\* percent from \*\*\* percent in the corresponding period of 1987.

#### U.S. producers' domestic shipments

Data on U.S. producers' domestic shipments of calcined bauxite proppants are presented in table 9. U.S. producers' domestic shipments of all calcined bauxite proppants decreased from \*\*\* pounds in 1985 to \*\*\* pounds in 1986, or by \*\*\* percent, and then increased by \*\*\* percent to \*\*\* pounds from 1986 to 1987. Shipments during January-October 1988 amounted to \*\*\* pounds, an increase of \*\*\* percent compared with the level of domestic shipments in the corresponding period of 1987.

Table 9

Calcined bauxite proppants: U.S. producers' domestic shipments, 1985-87, January-October 1987, and January-October 1988

\*       \*       \*       \*       \*       \*

The value of U.S. producers' domestic shipments of all calcined bauxite proppants decreased from \$\*\*\* in 1985 to \$\*\*\* in 1986, or by \*\*\* percent, and then decreased by \*\*\* percent to \$\*\*\* in 1987. During January-October 1988 shipments amounted to \$\*\*\*, an increase of \*\*\* percent compared with the level in the corresponding period of 1987.

The unit value of U.S. producers' domestic shipments of calcined bauxite proppants decreased from \*\*\* per pound in 1985 to \*\*\* per pound in 1986, and then fell sharply to \*\*\* per pound in 1987; the unit value during January-October 1988 was \*\*\*, an increase of \*\*\* percent compared with the unit value of \*\*\* during January-October 1987.

#### U.S. exports

Information on U.S. producers' exports of calcined bauxite proppants, obtained in response to the Commission's questionnaire, is presented in table 10. U.S. producers' exports \*\*\* from 1985 to 1986, as a result, \*\*\*. Export shipments fell by \*\*\* percent from 1986 to 1987 (\*\*\*); export shipments \*\*\* during January-October 1988, when compared with those in the corresponding period of 1987, because of \*\*\*. The level and trends of unit values of export shipments are similar to those of U.S. producers' domestic shipments, because export sales are \*\*\*. 1/

Table 10

Calcined bauxite proppants: U.S. producers' exports, 1985-87, January-October 1987, and January-October 1988

\*       \*       \*       \*       \*       \*

#### U.S. producers' inventories

U.S. producers' inventories of all calcined bauxite proppants decreased from \*\*\* pounds as of December 31, 1985, to \*\*\* pounds as of December 31, 1986, or by \*\*\* percent (table 11). Inventories increased to \*\*\* pounds as of December 31, 1987, or by \*\*\* percent. Inventories on October 31, 1988, amounted to \*\*\* pounds, an increase of \*\*\* percent compared with the level of inventories on October 31, 1987.

Table 11

Calcined bauxite proppants: U.S. producers' end-of-period inventories, 1985-87, January-October 1987, and January-October 1988

\*       \*       \*       \*       \*       \*

As a share of U.S. producers' total domestic shipments during the preceding year, inventories increased from \*\*\* percent as of December 31, 1985, to \*\*\* percent as of December 31, 1986, and then decreased to \*\*\* percent as of December 31, 1987. On the basis of annualized shipments, the ratio was \*\*\* percent as of October 31, 1987, decreasing to \*\*\* percent as of October 31, 1988. The relatively high level of inventories held by producers is necessary because service companies do not maintain inventories of intermediate- and high-strength proppants, and require the producer to deliver the proppant directly to a production site in 1 day.

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1/ July 15, 1988, telephone conversation with \*\*\*.

U.S. producers' employment and wages

The average number of production and related workers producing all calcined bauxite proppants for the two domestic producers decreased from \*\*\* in 1985 to \*\*\* in 1986, or by \*\*\* percent, and continued to decrease in 1987 to \*\*\* employees, or by \*\*\* percent (table 12). The number of workers in January-October 1988 was \*\*\*, representing an increase of \*\*\* percent from the \*\*\* workers in the corresponding period of 1987. The number of hours worked by production and related workers producing all calcined bauxite proppants decreased from \*\*\* to \*\*\* during 1985-87. The number of hours worked in January-October 1988 was \*\*\* representing an increase of \*\*\* percent from the number worked in the corresponding period of 1987. The trend in hourly wages and labor productivity was generally increasing during the period of investigation; however, increases from 1986 to 1987 are \*\*\*. Employees at the two U.S. establishments producing calcined bauxite proppants are not represented by unions.

In its questionnaire, the Commission requested U.S. producers to provide information concerning reductions in the number of production and related workers producing calcined bauxite proppants if these reductions involved at least 5 percent of the workforce or 50 workers. \*\*\*.

Table 12

Employment statistics for U.S. establishments in which calcined bauxite proppants are produced: Average number of employees, hours worked, wages paid, hourly wages, and labor productivity, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

Financial experience of U.S. producers

Both producers of calcined bauxite proppants are engaged \*\*\* in the manufacture of the subject product within their establishments. <sup>1/</sup> The \*\*\* characteristics of the two companies, especially in the areas of depreciation and/or amortization, distorted the operating results. A discussion of each producer is presented below. One producer of resin-coated sand, Santrol Products, Inc., provided income-and-loss data for its U.S. operations. A summary of that response is included in appendix C.

Carbo Ceramics, Inc.--The petitioner is the successor company to several prior organizations, as indicated below:

\* \* \* \* \*

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<sup>1/</sup> \*\*\*.



Table 13

Income-and-loss experience of Carbo Ceramics, Inc., on its operations producing calcined bauxite proppants, accounting years 1985-87 and interim periods ended Oct. 31, 1987, and Oct. 31, 1988 1/

\*       \*       \*       \*       \*       \*

Norton-Alcoa.--Norton-Alcoa Proppants is a partnership of Norton Proppants, Inc., a wholly owned subsidiary of Norton Co. (Norton) and Alcoa Proppants, Inc., a wholly owned subsidiary of Aluminum Company of America (Alcoa). \*\*\*.

Table 14

Income-and-loss experience of Norton-Alcoa on its operations producing calcined bauxite proppants, accounting years 1985-87 and interim periods ended Oct. 31, 1987, and Oct. 31, 1988

\*       \*       \*       \*       \*       \*

Income-and-loss experience of both U.S. producers.--The combined income-and-loss experience of the two producers is presented in table 15. Aggregate net sales declined by \*\*\* percent from \$\*\*\* in 1985 to \$\*\*\* in 1986. Such sales rose by \*\*\* percent to \$\*\*\* in 1987. In 1985, operating income was \$\*\*\*. \*\*\*. Net sales for the 1988 interim period were \$\*\*\*, an increase of \*\*\* percent over 1987 interim period sales of \$\*\*\*. In interim 1988 an \*\*\*.

Table 15

Income-and-loss experience of 2 U.S. producers on their operations producing calcined bauxite proppants, accounting years 1985-87 and interim periods ended Oct. 31, 1987, and Oct. 31, 1988

\*       \*       \*       \*       \*       \*

The combined income-and-loss experience, on an average per-pound basis, for the two producers of calcined bauxite proppants is presented in table 16. The average per-pound sales value decreased by \*\*\* percent from \*\*\* in 1985 to \*\*\* in 1986 and 1987. Operating income per pound of sales was \*\*\* in 1985. Operating losses per pound were \*\*\* in 1986 and \*\*\* in 1987. The average per pound sales value during the interim 1988 period was \*\*\*, an increase of \*\*\* percent from the interim 1987 period average sales value of \*\*\*. Operating income per pound was \*\*\* during interim 1988 compared with an operating loss of \*\*\* per pound during interim 1987.

Table 16

Income-and-loss experience (on an average per-pound basis) of 2 U.S. producers on their operations producing calcined bauxite proppants, accounting years 1985-87 and interim periods ended Oct. 31, 1987, and Oct. 31, 1988

\*       \*       \*       \*       \*       \*

Investment in productive facilities.--The investment in productive facilities of the two producers is presented in table 17.

Table 17

Calcined bauxite proppants: Total assets and value of property, plant, and equipment of U.S. producers, accounting years 1985-87 and interim periods ended Oct. 31, 1987, and Oct. 31, 1988

\*       \*       \*       \*       \*       \*

Capital expenditures.--The two producers supplied data on their capital expenditures for the period of investigation as shown in table 18.

Table 18

Calcined bauxite proppants: Capital expenditures by U.S. producers, accounting years 1985-87 and interim periods ended Oct. 31, 1987, and Oct. 31, 1988

\*       \*       \*       \*       \*       \*

Research and development expenses.--The outlays for research and development expenses on calcined bauxite proppants by the two producers are shown in the following tabulation (in thousands of dollars):

\*       \*       \*       \*       \*       \*

Capital and investment.--The Commission requested U.S. producers to describe any actual or potential negative effects of imports of calcined bauxite proppants from Australia on their firm's growth, investment, and ability to raise capital. The producers provided the following responses:

\*       \*       \*       \*       \*       \*

#### Consideration of the Question of Threat of Material Injury

Section 771(7)(F)(i) of the Tariff Act of 1930 (19 U.S.C. § 1677(7)(F)(i)) provides that--

In determining whether an industry in the United States is threatened with material injury by reason of imports (or sales for importation) of any merchandise, the Commission shall consider, among other relevant factors 1/ 2/--

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1/ Section 771(7)(F)(ii) of the act (19 U.S.C. § 1677(7)(F)(ii)) provides that "Any determination by the Commission under this title that an industry in the United States is threatened with material injury shall be made on the basis of evidence that the threat of material injury is real and that actual injury is

(I) If a subsidy is involved, such information as may be presented to it by the administering authority as to the nature of the subsidy (particularly as to whether the subsidy is an export subsidy inconsistent with the Agreement),

(II) any increase in production capacity or existing unused capacity in the exporting country likely to result in a significant increase in imports of the merchandise to the United States,

(III) any rapid increase in United States market penetration and the likelihood that the penetration will increase to an injurious level,

(IV) the probability that imports of the merchandise will enter the United States at prices that will have a depressing or suppressing effect on domestic prices of the merchandise,

(V) any substantial increase in inventories of the merchandise in the United States,

(VI) the presence of underutilized capacity for producing the merchandise in the exporting country,

(VII) any other demonstrable adverse trends that indicate the probability that the importation (or sale for importation) of the merchandise (whether or not it is actually being imported at the time) will be the cause of actual injury,

(VIII) the potential for product-shifting if production facilities owned or controlled by the foreign manufacturers, which can be used to produce products subject to investigation(s) under section 701 or 731 or to final orders under section 736, are also used to produce the merchandise under investigation,

(IX) in any investigation under this title which involves imports of both a raw agricultural product (within the meaning of paragraph (4)(E)(iv)) and any product processed from such raw agricultural product, the likelihood that there will be increased imports, by reason of product shifting, if there is an affirmative determination by the Commission under section 705(b)(1) or 735(b)(1) with respect to either the raw agricultural product or the processed agricultural product (but not both), and

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imminent. Such a determination may not be made on the basis of mere conjecture or supposition."

2/ The Omnibus Trade and Competitiveness Act of 1988 amended section 771(7)(F) of the Tariff Act of 1930 by adding two items to section 771(7)(F)(i) (19 U.S.C. §§ 1677(7)(F)(i)(IX) and (X)), and by adding section 771(7)(F)(iii) (19 U.S.C. § 1677(7)(F)(iii)) in its entirety. While this investigation was initiated prior to the effective date of the amendments, they are presented here for information.

(X) the actual and potential negative effects on the existing development and production efforts of the domestic industry, including efforts to develop a derivative or more advanced version of the like product. 1/

Information on the volume, U.S. market penetration, and pricing of imports of the subject merchandise (items (III) and (IV) above) is presented in the section entitled "Consideration of the causal relationship between the LTFV imports and the alleged material injury or threat thereof;" and the available information on the effects of imports of the subject merchandise on U.S. producers' existing development and production efforts (item X) is presented in the section entitled "Consideration of alleged material injury." Item (I), involving subsidies, and item (IX), involving agricultural products, do not apply in this case. The available data on foreign producers' operations (items (II) and (VI) above), and U.S. inventories of the subject products (item (V)) follow. "Product shifting" (item VIII) is not an issue in this case.

#### Foreign production, capacity, and capacity utilization

Information in this section of the report was received by the Commission during the preliminary investigation from counsel for the foreign producer. Additional information, as requested by Commission staff, that has been provided by the U.S. embassy in Canberra is also presented and noted.

There is one manufacturer of calcined bauxite proppants in Australia that exports to the United States--Comalco Limited. Based on information provided by counsel for Comalco, exports to the United States \*\*\*, accounting for approximately \*\*\* percent of the firm's total shipments; in \*\*\*, accounting for \*\*\* percent of total shipments; and in \*\*\*, accounting for an estimated \*\*\* percent of total shipments. Comalco shipped 10 million pounds of calcined bauxite proppants to the United States in August 1988, and \*\*\*. Information provided by counsel for Comalco in the preliminary investigation 2/ on the Australian industry's production, capacity, inventories, and total shipments is presented in table 19.

Counsel for Comalco wrote in the preliminary investigation to indicate that Comalco has no plans to resume or expand production capacity for calcined bauxite proppants. 3/ On the contrary, Comalco decided more than a year ago to

---

1/ Section 771(7)(F)(iii) of the act (19 U.S.C. 1677(7)(F)(iii)) further provides that, in antidumping investigations, "...the Commission shall consider whether dumping in the markets of foreign countries (as evidenced by dumping findings or antidumping remedies in other GATT member markets against the same class or kind of merchandise manufactured or exported by the same party as under investigation) suggests a threat of material injury to the domestic industry."

2/ Comalco did not provide updated information for April-October 1987 or April-October 1988.

3/ Independent industry sources in Australia confirmed that Comalco has ceased production of calcined bauxite proppants and that some of the plant and machinery have been dismantled (unclassified State Dept. telegram).

Table 19

Calcined bauxite proppants: Australian production, capacity, inventories, and total shipments, 1985-87, January-March 1987, and January-March 1988

\* \* \* \* \*

exit the proppant business (Comalco has not produced the subject product since \*\*\*). 1/ Counsel for the Australians also indicated that the Australian \*\*\*.

Petitioner testified at the hearing that it would not be difficult for Comalco to resume production of calcined bauxite proppants, i.e., within approximately 30 days, because Comalco still has the calcination plant in Weipa, Australia, which is used to produce abrasive-grade bauxite. Comalco must mine the abrasive-grade bauxite ore and then put the ore through a beneficiation plant for both washing and calcinating. Petitioner testified that it is at this processing step that Comalco strained off pisolites which would then be further processed into calcined bauxite proppants. Since Comalco continues to produce and sell abrasive-grade bauxite, this stream of small pisolites is still available for them to elect to resume the production of calcined bauxite proppants. 2/

#### Importer's inventories

The available data on the U.S. importer's inventories of imports of calcined bauxite proppants from Australia are presented in table 20.

Table 20

Calcined bauxite proppants: Inventories of Australian-produced merchandise, by inventory site, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

The U.S. importer's reported inventories of calcined bauxite proppants decreased steadily from \*\*\* pounds on December 31, 1985, to \*\*\* pounds on December 31, 1987, or by \*\*\* percent. Inventories on October 31, 1988, amounted to \*\*\* pounds, a decrease of less than \*\*\* percent compared with the level of inventories on October 31, 1987.

Comalco entered into a contract with TransAmerican Natural Gas Corp., effective May 25, 1988, to sell 10 million pounds of the subject product held in inventory in Australia, at a price of \*\*\* per pound. 3/ Petitioner testified at the hearing that approximately 5 million pounds of this shipment

1/ In a letter to the Commission dated Feb. 10, 1989, TANG withdrew its request to participate in the investigation because Comalco advised them that it was withdrawing from the proppants business.

2/ TR, pp. 12-15, prehearing brief (app. A), and posthearing brief, pp. 4-5, 9-10, and 15.

3/ The proppants were shipped to the United States in August and were entered by Customs in Corpus Christi, TX, on Oct. 11, 1988. Customs liquidated the entry in November.

is still held in a warehouse in Texas. 1/ \*\*\*. Comalco estimates that remaining inventory of the subject product in Australia is approximately \*\*\* pounds.

Consideration of the Causal Relationship Between the  
LTFV Imports and the Alleged Material Injury or Threat Thereof

U.S. imports

Data obtained on U.S. purchases of imports of calcined bauxite proppants from Australia are presented in table 21. The data presented in the table were compiled from responses to the Commission's questionnaire by four U.S. purchasers that accounted for all imports from Australia during the period of investigation. 2/

Table 21

Calcined bauxite proppants: U.S. purchases of imports from Australia, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

U.S. purchases of imports of all calcined bauxite proppants decreased from \*\*\* pounds, valued at \$\*\*\* in 1985, to \*\*\* pounds, valued at \$\*\*\* in 1987, or a decrease of \*\*\* percent in quantity and a decrease of \*\*\* percent in value. Purchases of imports of calcined bauxite proppants during January-October 1988 amounted to \*\*\* pounds, valued at \$\*\*\*, an increase of \*\*\* percent in quantity compared with the amount purchased during the entire year of 1987. 3/ The unit value (per pound) of U.S. purchases of imports of calcined bauxite proppants was \*\*\* in 1985, falling to \*\*\* during 1987 and January-October 1988.

Several factors have been mentioned for the lack of purchases of the subject product in 1986, including the uncertainties created by litigation concerning the Exxon use patent and the shift to intermediate-strength proppants as fewer deeper and more intermediate-depth wells were drilled when oil and gas prices declined.

Market penetration of imports

Shares of apparent consumption accounted for by purchases of imports of calcined bauxite proppants are presented in table 22. The data presented in the table were compiled from purchasers' responses to the Commission's questionnaires. Purchasers' responses have been used to calculate apparent consumption in order to more accurately measure the impact of imports on consumption. This is due to the fact that \*\*\*.

Purchases of imports of all calcined bauxite proppants accounted for \*\*\* percent of the U.S. market in 1985. \*\*\*. Purchases during 1987 accounted for \*\*\* percent of total apparent consumption, all of which occurred \*\*\*.

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1/ TR, p. 26, and posthearing brief, p. 10.

2/ \*\*\*.

3/ \*\*\*.

Table 22

Calcined bauxite proppants: Apparent U.S. consumption, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

Purchases of imports during January-October 1988 accounted for \*\*\* percent of consumption, 1/ \*\*\*.

### Prices

Demand for the major types of proppants, sand, resin-coated sand, and bauxite, depends on the extent to which hydraulic fracturing is used in the United States to increase production from oil and gas wells. Hydraulic fracturing may be used to increase the production of newly drilled wells, or in recompleting old wells, which have experienced decreases in production.

Demand for a specific proppant depends on the performance specifications of the proppant (e.g., crush strength and conductivity), the characteristics of the well to be fractured, and the price. Deeper wells generally have higher geologic stresses and require higher proppant strengths. Shallow wells of less than 8,000 feet do not require a high-strength proppant and generally use low-cost sand. 2/ Intermediate wells of 8,000 to 15,000 feet typically use low-density/intermediate-strength and intermediate-strength proppants. Sand is sometimes used at the lower end of the range of this category and high-strength proppants may be used at the upper end. Deep wells of more than 15,000 feet can use only high-strength bauxite proppants.

A given volume of a high-strength/heavier proppant will cost a purchaser more than the same volume of an intermediate-strength/light proppant. In addition to a higher price per pound, the high-density proppant weighs more (i.e., there are more pounds for a given volume). The users of domestic and imported high-strength bauxite proppants are also assessed a fee by Exxon of approximately 2 to 7 cents per pound depending on well depth, further increasing the cost of these proppants. 3/

With the collapse of oil and gas prices in 1985-86, drilling activity declined, lowering the demand for proppants used in hydraulic fracturing. The drilling of deep wells has declined more than proportionately, with an overall shift in drilling activity toward more shallow wells. Jesse Orsini, President of Carbo Ceramics, stated at the hearing that the market for bauxite proppants has shifted toward intermediate-strength and low-density bauxite proppants. 4/ The petitioner stated its belief that the Australians had to price Dura-Prop, a high-strength proppant, lower than the domestic intermediate proppant in order

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1/ \*\*\*.

2/ According to Jesse Orsini of Carbo Ceramics, ceramic proppants cost eight to nine times more than sand, TR, p. 19.

3/ See section of the report entitled "legal environment" for a description of the Exxon users' fee.

4/ TR, p. 67.

for Dura-Prop to be competitive in the U.S. market. 1/ Respondent stated that prices of Dura-Prop are calculated to compete on a "value to the customer" basis, taking into account its performance characteristics, specific gravity, and the royalty payments to Exxon. 2/

Bauxite proppants are sold to service companies for use in fracture operations for the oil and gas end user. Although the proppant is usually sold to the service company, it is delivered directly to the end user. Order lead times are generally less than \*\*\* days. U.S. producers quote their prices \*\*\*. The U.S. importer quotes its prices \*\*\*. 3/ Transportation costs range between \*\*\* per pound.

\*\*\*. 4/ Service companies do not like direct sales to end users because it eliminates the substantial margin that service companies receive by reselling the proppant to the end user. If the end user purchases the proppant directly, the service company will still perform the fracture operation, but will charge an additional pumping fee to recover part of the lost proppant resale margin. This pumping fee, however, is considerably less than the margin normally added to the proppant by the service company. 5/

\*\*\* Treco Sales, a sand proppant producer and the only U.S. firm \*\*\* the Australian bauxite product, reported that Treco Sales \*\*\*.

Service companies generally submit bids to end users for an entire fracture job, which includes the price of a proppant. The end user may request a specific proppant or it may ask the service company to recommend a proppant. Depending upon the type of proppant selected, the overall price of the job may be adjusted. As service companies purchase a proppant only after a sale is made to the end user, they generally purchase the bauxite proppant on a per-job basis. Only a small number of domestic sales are made under legally binding written contracts that fix price or quantity for multiple shipment sales. 6/

Proppant prices are quoted on a \*\*\* to the end users by service companies, and typically the end user does not know the proppant price paid by the service company to the U.S. producer. End users are affected by fluctuations in proppant prices when service companies update their price lists or when a request is made for a fracturing design and a price quote. End users are more likely to know the country of origin for the proppants they purchase than the specific manufacturer.

In most cases end users will request bids from two to four service companies for each fracturing job. Generally the choice of a service company is based on the price of a total job, which includes the price of proppants,

1/ Orsini remarked at the conference in the preliminary investigation that "No one was buying sintered bauxite ... [because] it's still heavier by weight, it still carries an Exxon royalty, an additional charge. So you don't need it." TR, p. 54.

2/ Comalco's postconference brief in the preliminary investigation, p. 4. Royalty fees are only payable on high-strength sintered bauxite proppants.

3/ \*\*\*.

4/ Telephone conversation with \*\*\*.

5/ Phone conversation with \*\*\*.

6/ The petitioner, Carbo Ceramics, reported that \*\*\* percent of its sales were long-term multiple-shipment contracts; Norton-Alcoa reported that \*\*\* percent of its sales were contracts. Santrol Products reported that \*\*\* its resin-coated sand proppants by long-term multiple-shipment contracts.



other materials, technical support, and service, rather than on the price of the proppant alone. However, the quality and availability of a specific proppant were cited by some end users as being more important than price in choosing a supplier. The service companies' reputation for reliability is also an important consideration.

#### Questionnaire price data

The Commission requested both U.S. producers and the U.S. importer of bauxite proppants to provide quarterly price data from January 1985 through September 1988 for three categories of calcined bauxite proppant products. <sup>1/</sup> The U.S. producers were responsible for all shipments of domestically produced bauxite proppants over these years, and the importer for all U.S. imports of the Australian product for the period 1985-87. For each product category, producers and importers were asked to report the total delivered selling price and the f.o.b. U.S. location price charged for their largest shipment in each quarter. The lowest and highest prices received for the sales of each of the products were also requested on a quarterly basis from October 1987 through September 1988. A definition of each of the product categories is given below:

Product 1: Low-density/intermediate-strength bauxite/ceramic proppants with mesh size of 20/40.

Product 2: Intermediate-strength sintered bauxite/ceramic proppants with mesh size of 20/40.

Product 3: High-strength sintered bauxite/ceramic proppants with mesh size of 20/40.

The U.S. producers' total shipments of products 1, 2, and 3 combined accounted for \*\*\* percent of all of the domestic shipments of calcined bauxite proppants (residual shipments were bauxite proppants \*\*\*). Product 1 accounted for \*\*\* percent of all domestic shipments, product 2 for \*\*\* percent, and product 3 for \*\*\* percent. The U.S. importer accounted for all U.S. imports of the Australian bauxite proppant during 1985-87. \*\*\*.

U.S. producers' price trends.-- According to U.S. producers, prices of all bauxite proppants declined during 1985-86 as a result of the rapid decline in oil and gas prices and the subsequent decline in drilling activity. Oil prices declined by 58 percent and gas prices by 33 percent from the first quarter of 1985 to the third quarter of 1986. <sup>2/</sup> These sharp declines led to a decrease in the number of fracturing operations and the demand for bauxite proppants.

U.S. producers' quarterly weighted-average selling prices for all bauxite proppants were at their lowest in 1986 and the first half of 1987, increasing

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<sup>1/</sup> The Commission also requested the two U.S. producers of resin-coated sand proppants to provide quarterly price data for two resin-coated sand proppant products that compete directly with bauxite/ceramic proppants. The two resin-coated sand products are a precured proppant and a curable proppant. These data are presented in app. C.

<sup>2/</sup> U.S. Department of Energy Monthly Energy Review (also see table 6).

somewhat towards the end of the period under investigation (table 23, figure 3). <sup>1/</sup> Prices for product 1 fell by \*\*\* percent from \*\*\* per pound in January-March 1985 to \*\*\* per pound in January-March 1987. Prices increased to \*\*\* per pound in the fourth quarter of 1987 before declining to \*\*\* per pound in 1988.

Table 23

Calcined bauxite proppants: Weighted-average net delivered selling prices reported by U.S. producers and importers of Australian calcined bauxite proppants, by products and by quarters, January 1985-September 1988

\*       \*       \*       \*       \*       \*

Figure 3

Calcined bauxite proppants: U.S. producers' weighted-average net delivered selling prices, by products and by quarters, January 1985-September 1988

\*       \*       \*       \*       \*       \*

U.S. producers' prices for product 2 were also lower in 1988 than in 1985. Prices fell by \*\*\* percent from \*\*\* per pound in the first quarter of 1985 to \*\*\* per pound in the first quarter of 1986. Prices then fluctuated within a range of \*\*\* per pound over the next six quarters, climbed to \*\*\* per pound in the first quarter of 1988, and declined to \*\*\* per pound in the last two quarters.

U.S. producers' prices of product 3 fell by approximately \*\*\* percent, or \*\*\*, from 1985 to 1988. Prices, which averaged \*\*\* per pound in 1985, declined to \*\*\* per pound in the first quarter of 1986, and fell to a low of \*\*\* per pound in the third quarter of the same year. After fluctuating for the next year, they rose to \*\*\* per pound in the last quarter of 1987 and first quarter of 1988, declining slightly to \*\*\* in the third quarter. The range of the lowest and highest prices charged for each U.S.-produced product during October 1987-September 1988 is presented by U.S. producer in the following tabulation (in cents per pound):

\*       \*       \*       \*       \*       \*

A much wider range of prices was reported by \*\*\*. \*\*\*. <sup>2/</sup> <sup>3/</sup>

Service companies' price trends.--Three service companies reported the f.o.b. prices they paid for their largest quarterly purchases from U.S. producers in each product category from 1986 through the third quarter of 1988 (table 24). In 1986 and 1987, there were small variations in the prices paid by each firm for each specific proppant product. However, in 1988, with one exception, \*\*\* prices were paid by each service company for each of the three products in each quarter.

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<sup>1/</sup> See app. E for the quantity of proppants sold.

<sup>2/</sup> \*\*\*.

<sup>3/</sup> \*\*\*.

Table 24

Calcined bauxite proppants: Net f.o.b. purchase prices of the U.S. product reported by service companies, by product, and by quarters, January 1986-September 1988 1/

\*       \*       \*       \*       \*       \*

Service companies list prices to end users are shown in table 25. These prices are for the proppant alone and do not include a pumping charge. Since 1982-83, end users have \*\*\* for proppants. Generally, the price of a total fracturing job, including the price of the proppants, is \*\*\*. 1/

Table 25

Calcined bauxite proppants: Service companies' list prices of U.S.-produced proppants, by product, and by quarters, January 1986-September 1988 1/ 2/

\*       \*       \*       \*       \*       \*

Service companies' purchase prices and end user list prices for the Australian product, Dura-Prop, are provided in table 26. During the period 1986-88, the Australian product was only \*\*\*.

Table 26

Calcined bauxite proppants: Quarterly net f.o.b. purchase prices of the Australian product and end user list prices reported by service companies, by quarters, October 1987-September 1988 1/

\*       \*       \*       \*       \*       \*

U.S. importer's price trends.--Treco Sales, the U.S. importer of the Australian proppant, reported that \*\*\* was the only type of calcined bauxite proppant which it sold in the United States during the period of investigation. Sales were \*\*\*. 2/ The net f.o.b. price for which it \*\*\*.

\*\*\* said he believed that \*\*\*. First, litigation was pending with Exxon over the question of whether purchasers of the Australian product were required to pay Exxon royalty fees. Secondly, the prices offered by the service companies to end users did not decline even though the Australians were offering their product to the service companies at a lower price.

Comalco reported in its postconference brief in the preliminary investigation that it was only after Comalco began to approach end users directly in late 1987 that the service companies began to purchase the imported product in any quantity. \*\*\* the service companies did not offer end users any

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1/ \*\*\*.

2/ Comalco, the Australian producer, reported that TransAmerican Natural Gas Corp. (TANG) directly purchased Australian-produced bauxite proppants for its own consumption in late 1988. \*\*\*.

significant price difference between the Australian and domestic product until the fourth quarter of 1987. 1/ \*\*\*, a service company, stated in its questionnaire that \*\*\*'s direct sales to customers resulted in other customers specifically requesting the Australian product. \*\*\* commented that the price decline of \*\*\* percent in the fourth quarter of 1987 from a price 2 years earlier is misleading. He asserted that the Australian offer price had been declining over the entire period of investigation due to lack of sales. \*\*\*, a service company, responded that he was quoted a price of \*\*\* per pound for the Australian product in February 1987.

Price comparisons.--Since purchasers have reported that the different types of bauxite proppants compete against each other in many applications, prices for the Australian proppant were compared with all three U.S.-produced products. In each case, the Australian import was less expensive than the domestic product. In the \*\*\*, the Australian import was \*\*\* per pound (\*\*\*) less expensive than the U.S.-produced bauxite proppants. In the \*\*\*, the price for the Australian proppant was \*\*\* per pound (\*\*\*) less expensive than the U.S.-produced bauxite proppants. And in the \*\*\*, the price for the Australian proppant was \*\*\* per pound (\*\*\*) less expensive than the U.S.-produced bauxite proppants.

#### Exchange rates

Quarterly data reported by the International Monetary Fund indicate that the currency of Australia depreciated relative to the U.S. dollar from the first quarter of 1985 to a low in the third quarter of 1986. It then appreciated for the rest of the period, except for a minor depreciation in the fourth quarter of 1987 (table 27). Overall, the Australian dollar appreciated relative to the U.S. dollar by approximately 6.4 percent during January-March 1985 to July-September 1988. A 26.8-percent increase in producer prices in Australia, compared with a 4.2-percent increase in producer prices in the United States during this period, resulted in an appreciation of 29.5 percent in the real-exchange rate index from January-March to July-September 1988.

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1/ \*\*\*.

Table 27

Indexes of the nominal and real exchange rates between the U.S. dollar and the Australian dollar, 1/ and indexes of producer prices in the United States and Australia, 2/ by quarters, 1985-88

(January-March 1985=100)				
Period	Nominal-exchange-rate index	Real-exchange-rate index	U.S. Producer Price Index	Australian Producer Price Index
1985:				
Jan.-Mar....	100.0	100.0	100.0	100.0
Apr.-June...	88.7	91.3	100.1	103.0
July-Sept...	92.9	97.9	99.4	104.8
Oct.-Dec....	91.5	96.8	100.0	105.8
1986:				
Jan.-Mar....	93.4	101.9	98.5	107.5
Apr.-June...	94.9	105.0	96.6	106.9
July-Sept...	82.7	94.3	96.2	109.7
Oct.-Dec....	86.2	100.6	96.5	112.6
1987:				
Jan.-Mar....	89.3	104.7	97.7	114.5
Apr.-June...	95.1	111.3	99.2	116.1
July-Sept...	95.1	111.8	100.3	117.9
Oct.-Dec....	93.7	111.6	100.8	120.1
1988:				
Jan.-Mar....	95.8	116.4	101.2	123.0
Apr.-June...	103.6	125.7	103.0	125.0
July-Sept...	106.4	129.5	104.2	126.8
Oct.-Dec....	111.7	<u>3/</u>	105.0	<u>3/</u>

1/ Based on exchange rates expressed in U.S. dollars per Australian dollar.

2/ The real-exchange-rate index is derived from the nominal exchange rates adjusted by the producer price indexes of each country. These indexes are derived from line 63 of the International Financial Statistics.

3/ No information available.

Source: International Monetary Fund, International Financial Statistics, March 1987 and February 1989.

Lost sales 1/

No additional allegations of lost sales were reported during the final investigation. During the preliminary investigation, eight allegations of lost sales involving four purchasers were supplied by the two U.S. producers of bauxite proppants. The petitioner, Carbo Ceramics, specified \*\*\* allegations of lost sales involving \*\*\* pounds, but was unable to quantify any dollar amount. The other U.S. producer, Norton-Alcoa, supplied \*\*\* allegations of lost sales involving \*\*\* pounds, valued at \$\*\*\*. 2/ Staff contacted the four purchasers during the preliminary and final investigations. 3/

Both U.S. producers expressed difficulty in supplying information on these alleged lost sales because the service company, not the U.S. producer, deals with the end user. Therefore, the producers could only cite the specific service company to whom the sale would have been made and not the end user. 4/ As stated earlier, the end user generally selects the proppant product from the service company that will only purchase the proppant from the producer after it makes a sale to the end user.

\*\*\* was named in \*\*\* allegations of lost sales by the two U.S. producers: \*\*\* in a lost sale allegation involving \*\*\*. According to \*\*\*, did purchase the Australian product in the \*\*\*. 5/ He was doubtful that \*\*\*'s purchases of the Australian product could have resulted in any domestic producer's lost sale as each purchase was made at the request of the customer. There was no bid process for these purchases, and \*\*\* did not reject any U.S.-producer's quotes. \*\*\* commented that \*\*\* did not know the reason behind the customers' selection of the Australian proppant, but assumed that the reason was ultimately determined by price.

\*\*\* cited three factors which determine the company from which \*\*\* purchases bauxite proppants -- customer preference, availability, and price. \*\*\* did not purchase the Australian product in 1986-87 because of litigation with Exxon concerning patent infringement by the Australian proppant.

\*\*\* was cited in \*\*\* allegations of lost sales by the two U.S. producers. \*\*\*.

\*\*\* could not recall the specific alleged lost sales, stating that he purchases whatever product his district sales and marketing people request. He commented that he had no knowledge of why his salesmen requested the Australian product. He did know that \*\*\* did not purchase any Australian product in \*\*\*. \*\*\* remarked that the factors it uses in its purchasing decisions for proppants are contractual commitments, price, service, quality, and customer preference.

\*\*\* was named by \*\*\* in a lost sale involving \*\*\* pounds that occurred in \*\*\*. \*\*\* stated that he has made only two purchases of the Australian product, \*\*\*. Both purchases were made at customer request and came after \*\*\* lost previous sales to these customers because \*\*\* did not offer the Australian proppant, which was at a lower price.

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1/ U.S. producers did not report any allegations of lost revenues.

2/ The dollar figure supplied by Norton-Alcoa reflects what \*\*\*.

3/ \*\*\* was the only purchaser cited in a lost sale allegation and contacted by staff during the preliminary investigation who did not respond to the allegation. \*\*\* did respond to this allegation during the final investigation.

4/ However, \*\*\* did name \*\*\* in a lost sale allegation. \*\*\*.

5/ \*\*\*.

\*\*\* was named by \*\*\* in a lost sale involving \*\*\*. \*\*\* confirmed purchasing the Australian product, but stated that it could not represent a lost sale to the domestic producer because the U.S. producer \*\*\*. \*\*\* he does not know the actual price difference between the U.S.-produced proppant and the Australian proppant. \*\*\*.





APPENDIX A  
FEDERAL REGISTER NOTICES



scheduling of a hearing to be held in connection with the investigation.

**SUMMARY:** The Commission hereby gives notice of the institution of final antidumping investigation No. 731-TA-411 (Final) under section 735(b) of the Tariff Act of 1930 (19 U.S.C. 1673d(b)) (the act) to determine whether an industry in the United States is materially injured, or is threatened with material injury, or the establishment of an industry in the United States is materially retarded, by reason of imports from Australia of calcined bauxite proppants, provided for in item 521.17 of the Tariff Schedules of the United States (subheading 2606.00.00 of the Harmonized Tariff Schedule of the United States), that have been found by the Department of Commerce, in a preliminary determination, to be sold in the United States at less than fair value (LTFV). Unless the investigation is extended, Commerce will make its final LTFV determination on or before February 8, 1989, and the Commission will make its final injury determination by March 28, 1989 (see sections 735(a) and 735(b) of the act (19 U.S.C. 1673d(a) and 1673d(b))).

For further information concerning the conduct of this investigation, hearing procedures, and rules of general application, consult the Commission's Rules of Practice and Procedure, Part 207, Subparts A and C (19 CFR Part 207), and Part 201, Subparts A through E (19 CFR Part 201).

**EFFECTIVE DATE:** November 29, 1988.

**FOR FURTHER INFORMATION CONTACT:** Valerie Newkirk (202-252-1190), Office of Investigations, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202-252-1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-252-1000.

**SUPPLEMENTARY INFORMATION:**

**Background**

This investigation is being instituted as a result of an affirmative preliminary determination by the Department of Commerce that imports of calcined bauxite proppants from Australia are being, or are likely to be, sold in the United States at less than fair value within the meaning of section 731 of the act (19 U.S.C. 1673). The investigation was requested in a petition filed on June 14, 1988, by counsel on behalf of Carbo-

Ceramics, Inc., Irving, TX. In response to that petition the Commission conducted a preliminary antidumping investigation and, on the basis of information developed during the course of that investigation, determined that there was a reasonable indication that an industry in the United States was materially injured or threatened with material injury by reason of imports of the subject merchandise (53 FR 29295, August 4, 1988).

**Participation in the Investigation**

Persons wishing to participate in this investigation as parties must file an entry of appearance with the Secretary to the Commission, as provided in § 201.11 of the Commission's rules (19 CFR 201.11), not later than twenty-one (21) days after the publication of this notice in the Federal Register. Any entry of appearance filed after this date will be referred to the Chairman, who will determine whether to accept the late entry for good cause shown by the person desiring to file the entry.

**Service List**

Pursuant to § 201.11(d) of the Commission's rules (19 CFR 201.11(d)), the Secretary will prepare a service list containing the names and addresses of all persons, or their representatives, who are parties to this investigation upon the expiration of the period for filing entries of appearance. In accordance with §§ 201.16(c) and 207.3 of the rules (19 CFR 201.16(c) and 207.3), each document filed by a party to the investigation must be served on all other parties to the investigation (as identified by the service list), and a certificate of service must accompany the document. The Secretary will not accept a document for filing without a certificate of service.

**Limited Disclosure of Business Proprietary Information Under a Protective Order**

Pursuant to § 207.7(a) of the Commission's rules (19 CFR 207.7(a) as amended 53 FR 33039 (Aug. 29, 1988)), the Secretary will make available business proprietary information gathered in this final investigation to authorized applicants under a protective order, provided that the application be made not later than twenty-one (21) days after the publication of this notice in the Federal Register. A separate service list will be maintained by the Secretary for those parties authorized to receive business proprietary information under a protective order. The Secretary will not accept any submission by parties containing business proprietary

**INTERNATIONAL TRADE COMMISSION**

[Investigation No. 731-TA-411 (Final)]

**Calcined Bauxite Proppants From Australia**

**AGENCY:** United States International Trade Commission.

**ACTION:** Institution of a final antidumping investigation and

information without a certificate of service indicating that it has been served on all the parties that are authorized to receive such information under a protective order.

#### Staff report

The prehearing staff report in this investigation will be placed in the nonpublic record on February 2, 1989, and a public version will be issued thereafter, pursuant to § 207.21 of the Commission's rules (19 CFR 207.21).

#### Hearing

The Commission will hold a hearing in connection with this investigation beginning at 9:30 a.m. on February 22, 1989, at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC. Requests to appear at the hearing should be filed in writing with the Secretary to the Commission not later than the close of business (5:15 p.m.) on February 10, 1989. All persons desiring to appear at the hearing and make oral presentations should file prehearing briefs and attend a prehearing conference to be held at 9:30 a.m. on February 14, 1989, at the U.S. International Trade Commission Building. The deadline for filing prehearing briefs is February 14, 1989.

Testimony at the public hearing is governed by § 207.23 of the Commission's rules (19 CFR 207.23). This rule requires that testimony be limited to a nonbusiness proprietary summary and analysis of material contained in prehearing briefs and to information not available at the time the prehearing brief was submitted. Any written materials submitted at the hearing must be filed in accordance with the procedures described below and any business proprietary materials must be submitted at least three (3) working days prior to the hearing (see § 201.6(b)(2) of the Commission's Rule (19 CFR 201.6(b)(2))).

#### Written Submissions

All legal arguments, economic analyses, and factual materials relevant to the public hearing should be included in prehearing briefs in accordance with § 207.22 of the Commission's rules (19 CFR 207.22). Posthearing briefs must conform with the provisions of § 207.24 (19 CFR 207.24) and must be submitted not later than the close of business on February 27, 1989. In addition, any person who has not entered an appearance as a party to the investigation may submit a written statement of information pertinent to the subject of the investigation on or before February 27, 1989.

A signed original and fourteen (14) copies of each submission must be filed with the Secretary to the Commission in accordance with § 201.8 of the Commission's rules (19 CFR 201.8). All written submissions except for business proprietary data will be available for public inspection during regular business hours (8:45 a.m. to 5:15 p.m.) in the Office of the Secretary to the Commission.

Any information for which business proprietary treatment is desired must be submitted separately. The envelope and all pages of such submissions must be clearly labeled "Business Proprietary Information." Business proprietary submissions and requests for business proprietary treatment must conform with the requirements of §§ 201.6 and 207.7 of the Commission's rules (19 CFR 201.6 and 207.7).

Parties which obtain disclosure of business proprietary information pursuant to § 207.7(a) of the Commission's rules (19 CFR 207.7(a)) may comment on such information in their prehearing and posthearing briefs, and may also file additional written comments on such information no later than March 3, 1989. Such additional comments must be limited to comments on business proprietary information received in or after the posthearing briefs.

**Authority:** This investigation is being conducted under authority of the Tariff Act of 1930, title VII. This notice is published pursuant to § 207.20 of the Commission's rules (19 CFR 207.20).

By order of the Commission.

Issued: December 21, 1988.

Kenneth R. Mason,

Secretary.

[FR Doc. 88-29809 Filed 12-27-88; 8:45 am]

BILLING CODE 7020-02-M

## DEPARTMENT OF COMMERCE

## International Trade Administration

[A-602-801]

**Final Determination of Sales at Less Than Fair Value; Calcined Bauxite Proppants From Australia****AGENCY:** Import Administration, International Trade Administration.**ACTION:** Notice.

**SUMMARY:** We determine that calcined bauxite proppants from Australia are being, or are likely to be, sold in the United States at less than fair value. We also determine that critical circumstances do not exist with respect to imports of the subject merchandise from Australia. We have notified the U.S. International Trade Commission (ITC) of our determination and have directed the Customs Service to continue to suspend liquidation of all entries of the subject merchandise from Australia as described in the "Continuation of Suspension of Liquidation" section of this notice.

**EFFECTIVE DATE:** February 9, 1989.

**FOR FURTHER INFORMATION CONTACT:** Contact Alain Letort or Richard Capwell, Office of Agreements Compliance, Import Administration, International Trade Administration, U.S. Department of Commerce, 14th Street and Constitution Avenue NW, Washington, DC 20230, telephone: 202/377-3818 (Letort) or 202/377-8668 (Capwell).

**SUPPLEMENTARY INFORMATION:****Final Determination**

We have determined that calcined bauxite proppants from Australia are being, or are likely to be, sold in the United States at less than fair value within the meaning of section 735 of the Tariff Act of 1930, as amended (19 U.S.C. 1673d) (the Act). The estimated margin of sales at less than fair value is 75.00 percent *ad valorem*, as shown in the "Continuation of Suspension of Liquidation" section of this notice.

**Case History**

On November 21, 1988, we made an affirmative preliminary determination in this case (53 FR 47842—November 28, 1988). Since the publication of that notice, we have received no response or comments from Comalco Aluminum Limited (Comalco), which accounted for virtually all the exports to the United States from Australia during the period of investigation. We have received no comments from any other interested party in this investigation.

**Scope of Investigation**

The United States has developed a system of tariff classification based on the international harmonized system of customs nomenclature. On January 1, 1989, the U.S. tariff schedules were fully converted from the *Tariff Schedules of the United States, Annotated* (TSUSA) to the *Harmonized Tariff Schedule* (HTS), as provided for in section 1201 *et seq.* of the Omnibus Trade and Competitiveness Act of 1988. All merchandise entered, or withdrawn from warehouse, for consumption, on or after that date is now classified solely according to the appropriate HTS item number(s). As with the TSUSA numbers, the HTS numbers are provided for convenience and customs purposes. The written product description remains dispositive.

The products covered by this investigation are calcined bauxite proppants, which are currently provided for under HTS item number 2606.00.00.60.

**Period of Investigation**

The period of investigation for calcined bauxite proppants from Australia extends from January 1, 1988 through June 30, 1988.

**Fair Value Comparisons**

To determine whether the sales of the subject merchandise in the United States were made at less than fair value, we compared the United States price, based on the best information available, with the foreign market value, also based on the best information available. We used the best information available, as required by section 776(c) of the Act, because Comalco failed to submit an appropriate response.

**United States Price**

Since we did not have specific data as to the quantities and prices of the subject merchandise sold in the United States, we used the price information available, pursuant to section 776(c) of the Act. We used the packed United States price estimated by petitioner minus deductions for foreign inland freight, ocean freight, marine insurance, and brokerage and handling charges.

**Foreign Market Value**

Since we did not have specific data with respect to the quantities and prices of the subject merchandise sold in Australia or third countries, we used the constructed value of the subject merchandise provided in the petition as the best information available, pursuant to section 776(c) of the Act. The constructed value calculated in the

petition was based on the petitioner's manufacturing costs plus petitioner's general expenses, which were higher than the statutorily required minimum of 10 percent. To this cost of production we made the statutorily mandated addition of 8 percent for profit.

#### Critical Circumstances

The petitioner alleges that "critical circumstances" exist with respect to imports of calcined bauxite proppants from Australia. Under section 735(a)(3) of the Act, critical circumstances exist if we determine that there is a reasonable basis to believe or suspect that:

- (A) (i) there is a history of dumping in the United States or elsewhere of the class or kind of merchandise which is the subject of the investigation; or
- (ii) the person by whom, or for whose account, the merchandise was imported knew or should have known that the exporter was selling the merchandise which is the subject of the investigation at less than its fair value; and
- (B) there have been massive imports of the class or kind of merchandise which is the subject of the investigation over a relatively short period.

Pursuant to section 735(a)(3)(B), we generally consider the following factors in determining whether imports have been massive over a relatively short period of time (1) The volume and value of imports; (2) seasonal trends (if applicable); and (3) the share of domestic consumption accounted for by imports.

Based on our analysis of Bureau of the Census import data, we find that imports of calcined bauxite proppants from Australia have not been massive over a relatively short period of time. Therefore, we need not address the issues of whether importers knew, or should have known, that the exporters were selling the subject merchandise at less than its fair value, or whether there is a history of dumping in the United States or elsewhere of the class or kind of merchandise which is the subject of this investigation.

In light of the above, we determine that critical circumstances, within the meaning of section 735(a)(3) of the Act, do not exist with respect to imports of calcined bauxite proppants from Australia.

#### Continuation of Suspension of Liquidation

We are directing the U.S. Customs Service to continue to suspend liquidation of all entries of calcined bauxite proppants from Australia that are entered, or withdrawn from warehouse, for consumption, on or after November 28, 1988, the date of

publication of the preliminary determination in the Federal Register. The U.S. Customs Service shall require a cash deposit or posting of a bond equal to the estimated amount by which the foreign market value of the merchandise subject to this investigation exceeds the United States price, which is 75.00 percent *ad valorem*. This suspension of liquidation will remain in effect until further notice.

#### ITC Notification

In accordance with section 735(d) of the Act, we have notified the ITC of our determination. If the ITC determines that material injury, or threat of material injury, does not exist in this case, this proceeding will be terminated and all securities posted as a result of suspension of liquidation will be refunded. If, however, the ITC determines that material injury, or threat of material injury, does exist, we will issue an antidumping duty order directing Customs officers to assess an antidumping duty on calcined bauxite proppants from Australia which are entered, or withdrawn from warehouse, for consumption, on or after the date on which liquidation was suspended. The antidumping duty will equal the amount by which the foreign market value of the subject merchandise exceeds United States price.

This determination is published pursuant to section 735(d) of the Act (19 U.S.C. 1673d(d)).

Jan W. Mares,  
Assistant Secretary for Import  
Administration.

February 2, 1989.

[FR Doc. 89-3113 Filed 2-8-89; 8:45 am]

BILLING CODE 2510-03-M

APPENDIX B  
LIST OF WITNESSES





CALENDAR OF THE PUBLIC HEARING

Those listed below appeared at the United States International Trade Commission's hearing:

Subject : Calcined Bauxite Proppants  
from Australia

Inv. No. : 731-TA-411 (Final)

Date and Time : February 22, 1989 - 9:30 a.m.

Session was held in connection with the investigation in the Main Hearing Room 101 of the United States International Trade Commission, 500 E Street, S.W. in Washington.

In support of the imposition of  
antidumping duties:

Scott C. Whitney, P.C.  
Bentonville, Virginia  
on behalf of

Carbo Ceramics, Inc.  
Jesse P. Orsini, President

Scott C. Whitney--OF COUNSEL



APPENDIX C

DATA PROVIDED BY U.S. PRODUCERS OF RESIN-COATED SAND

Table C-1

Resin-coated sands: U.S. production, end-of-period capacity, and capacity utilization, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

Table C-2

Resin-coated sands: U.S. producers' domestic shipments, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

Table C-3

Resin-coated sands: U.S. producers' exports, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

Table C-4

Resin-coated sands: U.S. producers' end-of-period inventories, 1985-87, January-October 1987, and January-October 1988

\* \* \* \* \*

Table C-5

Income-and-loss experience of Santrol Products, Inc. on its operations producing resin-coated sand, accounting years 1985-87 and interim periods ended October 31, 1987, and October 31, 1988

\* \* \* \* \*

Research and development expenses relating to resin-coated sand for Santrol Products, Inc. are shown in the following tabulation (in thousands of dollars):

\* \* \* \* \*

Price trends for resin-coated sand proppants

The Commission requested U.S. producers of resin-coated sand proppants to provide quarterly price data for January 1985 through September 1988 for the specific curable and precured resin-coated sand proppants that they believe compete directly with bauxite/ceramic proppants. For each product, producers were asked to report the total delivered selling price and the f.o.b. (U.S. location) price for their largest shipment in each quarter. In addition, producers were requested to report both the lowest and highest price of the products, by quarter, during October 1987-September 1988.

One U.S. producer reported price data during the investigation. Its total shipments of products 4 (curable resin-coated sand proppant) and 5 (precured resin-coated sand proppant) accounted for \*\*\* percent of its total reported U.S. shipments of resin-coated sand proppants in 1987; product 4 accounted for \*\*\* percent and product 5 accounted for \*\*\* percent.

The producer's quarterly weighted-average f.o.b. selling prices changed in \*\*\* quarter during the period under investigation, falling by \*\*\* per pound for both products during the \*\*\* (table C-6). \*\*\*. 1/

Table C-6

Resin-coated sand proppants: Weighted-average net delivered selling prices reported by U.S. producers of resin-coated sand proppants, by products and by quarters, January 1985-September 1988

\*       \*       \*       \*       \*       \*

---

1/ The U.S. producer, Santrol Products, also reported that \*\*\*.



APPENDIX D  
COMALCO CONTRACT

\* \* \* \* \*



APPENDIX E

SALES QUANTITIES OF BAUXITE PROPPANTS SOLD  
BY U.S. PRODUCERS AND IMPORTERS

**Table E-1**

**Calcined bauxite proppants: Largest-shipment quantities sold by U.S. producers and importers of Australian calcined bauxite proppants, by products and by quarters, January 1985-September 1988**

\* \* \* \* \*