UNITED STATES TARIFF COMMISSION

SUMMARIES OF TRADE AND TARIFF INFORMATION

Prepared in Terms of the Tariff Schedules of the United States (TSUS)

Schedule 5

Nonmetallic Minerals and Products
(In 5 volumes)

Volume 1

Cement, Concrete, Lime, Gypsum, Stone, Mica, Graphite, Asbestos, Abrasives, and Products Thereof

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SUMMARIES OF TRADE AND TARIFF INFORMATION BY SCHEDULES

Schedule 1 - Animal and Vegetable Products
(In 14 volumes)
Schedule 2 - Wood and Paper; Printed Matter
(In 5 volumes)
Schedule 3 - Textile Fibers and Textile Products
(In 6 volumes)
Schedule 4 - Chemicals and Related Products
(In 12 volumes)
Schedule 5 - Nonmetallic Minerals and Products
(In 5 volumes)
Schedule 6 - Metals and Metal Products
(In 11 volumes)
Schedule 7 - Specified Products; Miscellaneous and Nonenumerated Products
(In 8 volumes)
Schedule 8 - Special Classification Provisions
(In 1 volume)

Schedule 5 Volumes

1 - Cement, Concrete, Lime, Gypsum, Stone, Mica, Graphite, Asbestos, Abrasives, and Products Thereof
2 - Gems, Gemstones, Industrial Diamonds, Clays, Fluorspar, Talc, and Miscellaneous Nonmetallic Minerals and Products Thereof
3 - Refractories; Ceramic Construction, Household, and Industrial Articles
4 - Pressed and Blown Glassware
5 - Flat Glass and Products; and Other Glass Products Used Primarily in Construction

F O R E W O R D

In an address delivered in Boston on May 18, 1917, Frank W. Taussig, distinguished first chairman of the Tariff Commission, delineated the responsibility of the newly established Commission to operate as a source of objective, factual information on tariffs and trade. He stated that the Commission was already preparing a catalog of tariff information--

> designed to have on hand, in compact and simple form, all available data on the growth, development, and location of industries affected by the tariff, on the extent of domestic production, on the extent of imports, on the conditions of competition between domestic and foreign products.

The first such report was issued in 1920. Subsequently three series of summaries of tariff information on commodities were published--in 1921, 1929, and 1948-50. The current series, entitled Summaries of Trade and Tariff Information, presents the information in terms of the tariff items provided for in the eight tariff schedules of the Tariff Schedules of the United States (TSUS), which on August 31, 1963, replaced the 16 schedules of the Tariff Act of 1930.

Through its professional staff of commodity specialists, economists, lawyers, statisticians, and accountants, the Commission follows the movement of thousands of articles in international commodity trade and during the years of its existence has built up a reservoir of knowledge and understanding not only with respect to imports but also regarding products and their uses, techniques of manufacturing and processing, commercial practices, and markets. Accordingly, the Commission believes that the current series of summaries, when completed, will be the most comprehensive publication of its kind and will present benchmark information that will serve many interests. This project, although encyclopedic, attempts to conform with Chairman Taussig's admonition to be "exhaustive in inquiry, and at the same time brief and discriminating in statement."

This series is being published in 62 volumes of summaries, each volume to be issued as soon as completed. Although the order of publication may not follow the numerical sequence of the items in the TSUS, all items are to be covered. As far as practicable, each volume reflects the most recent developments affecting U.S. foreign trade in the commodities included.

SUMMARIES OF TRADE AND TARIFF INFORMATION

SCHEDULE 5

Volume 1

C O N T E N T S

Numerical List of TSUS Items in This Volume

Numerical List of TSUS Items in This Volume

INTRODUCTION

This volume, identified as volume 5:1, is one of a series of five volumes on the nonmetallic minerals and products classified under schedule 5 of the Tariff Schedules of the United States (TSUS). Schedule 5 is divided into three parts, and this volume is one of two volumes that deal with the nonmetallic minerals and products classified in part 1 of schedule 5.

This volume comprises 31 summaries covering all nonmetallic minerals and products classifiable under subparts A, B, C, D, E, F, and G of part 1 of schedule 5, as well as carbon or graphite crucibles (item 531.33) classifiable under subpart A of part 2 of schedule 5. The complete list of these nonmetallic minerals and products is included in appendix A to this volume.

Subpart A covers hydraulic cements, concrete mixes, and concrete products. In 1968, U.S. imports of hydraulic cements were valued at about $17.5 million, and imports of concrete mixes and articles of concrete, at $1.4 million; these imports are small compared with total domestic consumption in that year, amounting to $1.3 billion and $2.4 billion, respectively. Most of the imports of concrete articles consisted of terrazzo tile and cement tile, collectively termed "concrete tile," which is less than 1.25 inches in thickness.

Subpart B covers lime, gypsum rock, gypsum plaster, and articles, not specially provided for, of plaster of Paris. Of these, only imports of gypsum rock are important; the value of annual imports of gypsum rock ranges from $10 million to $15 million, compared with an annual domestic output valued at about $35 million. Imported gypsum rock is used at plants producing gypsum products in or near populous areas on the Atlantic, gulf, and Pacific coasts; virtually all of these plants were so located with the expectation of using imported gypsum rock. This subpart does not cover gypsum or plaster building boards and lath (see part 3 of schedule 2).

Subpart C covers stone and stone products, with certain exceptions, as follows: Limestone to be used in the manufacture of fertilizer; articles of concrete in which stone chips or particles are used as aggregate; certain abrasives and abrasive stones; precious and semiprecious stones; talc, soapstone, or Cornwall stone; and certain articles provided for in schedule 7. Total imports in 1968 of products covered by this subpart were valued at $26 million; the largest share of these imports consisted of marble and marble articles, mainly from Italy, with smaller amounts of slate articles from Italy, crushed stone from Canada, and miscellaneous stone products mainly from Italy, Canada, and Portugal. The value of domestic production of stone and stone products exceeds $1 billion annually.

Subpart D covers natural and synthetic mica and mica products, including ground mica. The principal import items in this subpart are mica splittings, split block mica, and cut or stamped mica. India and Brazil are the major sources of these items. With the exception of waste and scrap and ground mica, the United States is dependent on imports for its supply of mica.

Subpart E covers artificial and natural graphite, calcined petroleum and coal coke, carbon or graphite electrodes and lighting carbons, carbon or graphite crucibles, and articles, not specially provided for, of carbon or graphite. By far the largest import item in this subpart is carbon or graphite electrodes for electric furnaces or electrolytic purposes; imports of such electrodes, largely from Japan, were valued at more than $7 million in 1968, and constituted possibly 10 to 15 percent of total consumption.

Subpart F covers asbestos and asbestos products, with the exception of asbestos-containing footwear, headwear, gloves, laminated or reinforced plastics, and certain other articles provided for in schedule 7. Of the 81 million dollars' worth of imports in 1968 under this subpart, nearly 73 million dollars' worth consisted of asbestos fiber of different types and grades; 90 percent of the value of the imported asbestos fiber was accounted for by Canada, and most of the remainder, by the Republic of South Africa. Production of asbestos fiber in the United States has more than doubled in the past 5 years and now has an annual value of about $11 million. Moderate amounts of asbestos textiles, asbestos cement articles, and other asbestos products also were imported.

Subpart G covers pumice and certain other crude minerals (whether or not such minerals are of abrasive quality) commonly used for making abrasives and abrasive articles, certain minerals and artificial abrasives in forms suitable for use as abrasives or for abrasive purposes, coated abrasives, abrasive wheels, and other articles used for abrasive purposes. This subpart excludes the following: Sand, and crushed or powdered glass, unless made up into abrasive articles; natural or synthetic diamond dust or powder; cosmetics and other toilet preparations; soap and synthetic detergents; wheels or other abrasive articles mounted in frameworks or machines; dental burrs; and tools to which abrasives have been applied but which have other functioning or working elements such as cutting teeth, edges, grooves, and flutes. As used in this subpart, the term "pumice" includes both pumice and pumicite, and the term "wheels" embraces rotary cutters, disks, and other circular bodies designed to rotate on a central axis.

By far the major part of the imports classifiable under subpart G consist of the artificial abrasive materials aluminum oxide and silicon carbide in the crude state; most of this material comes from Canada, where it is produced largely by U.S. firms or subsidiaries thereof.

In addition to about 31 million dollars' worth of crude aluminum oxide and silicon carbide, or substantially all of those materials consumed in the United States, about 3 million dollars' worth of ground or refined aluminum oxide and silicon carbide was imported in 1968. Other abrasive products imported in moderate amounts include coated abrasives and abrasive wheels. Some pumice is imported for abrasive use, but most imported pumice is used as an aggregate in concrete products.

The United States exports small to moderate quantities of some of the materials and products classifiable under the several subparts covered in this volume, principally calcined petroleum coke, various stone products, portland cement, coated abrasives, various asbestos products, and abrasive wheels.

The TSUSA (1969), pertinent sections of which are reproduced in appendix A to this volume, shows the concessions granted by the United States in the tariff negotiations concluded on June 30, 1967, commonly referred to as the Kennedy Round. Under the Trade Expansion Act of 1962 (76 Stat. 872), most U.S. concessions involving reductions in duty are to be placed in effect in five stages. The first stage became effective on January 1, 1968, the second on January 1, 1969, and subsequent stages will go into effect at annual intervals. In 1967 the imports of the products included in this volume on which concessions were granted were valued at about $69 million and were dutiable at rates which averaged about 8.7 percent ad valorem. If the duties on these 1967 imports had been assessed on the basis of the final stage rates rather than the 1967 rates, the comparable average ad valorem rate would have been 3.9 percent; in other words, the total amount of the duty would have been reduced by about 55 percent. (The overall reduction exceeds the usual 50 percent principally because the duties on two important items, standard portland cement and lime, will be completely eliminated.) In 1968 the imports of the products included in this volume on which concessions had been granted were valued at $75 million and were dutiable at rates which averaged about 7.5 percent ad valorem.

Commodity	TSUS item
Hydraulic cement and cement clinker-------	511.11 - .14

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Although the United States is on a net import basis with respect to hydraulic cement, total imports (valued at about $16 million a year during 1966-68) generally supply between 1 percent and 2 percent of total consumption.

Description and uses

Hydraulic cement is a finely ground mineral bonding agent. When water is added to it, a chemical reaction occurs which causes the growth of numerous interlocking mineral crystals, resulting in a stonelike product called concrete, which is resistant to disintegration in water or under ordinary conditions of impact and abrasion. In the preparation of most hydraulic cements, a properly proportioned natural or prepared mixture of limestone, clay, silica, and other raw materials is burned in a rotary or vertical kiln. The kiln product, in the form of balls or lumps known as clinker, is pulverized along with a small amount of gypsum to obtain the final product.

There are four major kinds of hydraulic cement--portland (including white, nonstaining cement), natural, puzzolan, and masonry cement. Not included in this summary are such hydraulic materials as lime and gypsum plasters and oxychloride cements, all of which are provided for elsewhere in the TSUS. Portland cement has accounted for about 95 percent of domestic production and for virtually all imports in recent years.

The Federal Government and the American Society for Testing and Materials recognize five types of portland cement. Type I (also called standard or general use) accounts for the great bulk of the portland cement used in construction work because it is the cheapest and most widely available cement having the qualities and properties necessary for that type of application. Moreover, Type I is a highly standardized product that varies little either from plant to plant or from country to country because of the close chemical and process control used in its manufacture. Hence, domestic and imported Type I portland cements may be used interchangeably. Each of the other types is especially suited for certain purposes; for instance, Type III is

used where high early strength of product is required, and Type IV is used where the product must have good resistance to sulfate solutions.

White, nonstaining portland cement is not a type of cement; it usually possesses the principal properties of Type I or Type III cement and is distinguishable only by its white color; it is a premium-priced specialty which is utilized in decorative structural concrete applications where concrete of either extremely white or uniformly pigmented color is specified.

Hydraulic cement is mixed with water and gravel and/or sand or other aggregate to produce concrete for the construction of highways, buildings, dams, bridges, and water systems. (See summary on concrete mixes and articles of concrete, items 511.21 to 511.71). Steel, asphalt, or other materials may be used rather than concrete in some applications; concrete made from portland or other hydraulic cements, however, has certain advantages as a building material from the standpoint of economy, general availability, adaptability or flexibility in use, and product performance. Frequently, hydraulic cement concrete may be only partly replaced by other materials which are used in the same project. For example, an asphalt road surface may be laid on a concrete bed, or a clay brick house may require a concrete foundation as well as masonry cement mortar to bond the bricks.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Hydraulic cement and cement clinker:			
511.11	White, nonstaining portland cement.	3¢ per 100 lbs. including weight of containers	2¢ per 100 lbs., including weight of containers	1¢ per 100 lbs., including weight of containers
511.14	Other	2.25¢ per 100 lbs. including weight of containers	1.3¢ per 100 lbs., including weight of containers	Free

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reduction of 66 2/3 percent and 100 percent, respectively, on items 511.11 and 511.14, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Based on imports in 1968, the average ad valorem equivalent of the 1968 rate of duty on item 511.11 was 2.0 percent; that on item 511.14 was 2.6 percent. Although the specific rate of duty on white cement was 54 percent higher than the rate on other hydraulic cements

and cement clinker, the ad valorem equivalent of the former rate was lower than that of the latter because white cement usually costs nearly twice as much as standard cement and three times as much as cement clinker.

In the period 1958-65, domestic cement producers filed with the U.S. Treasury Department, under the Antidumping Act of 1921, as amended, a number of complaints in connection with imports of cement from various countries, including two or more separate complaints on imports from four separate countries. About two-thirds of these complaints were dismissed by the Treasury Department with no findings of sales at less than fair value. Seven complaints were referred to the U.S. Tariff Commission for determination of whether a domestic industry was being, or was likely to be, injured, or was prevented from being established, by reason of the complained-of imports. The Commission made affirmative determinations of injury in four of these cases, whereupon in each case the Treasury Department issued a finding of dumping. A special dumping duty is assessed on "dumped" shipments entered on or after 120 days prior to the date on which the Treasury Department received the complaint regarding such dumping, unless the shipment was appraised prior the the dumping findings in which case a dumping duty is not applicable.

U.S. consumption

Except in time of war, U.S. consumption of portland and other hydraulic cements is governed largely by the volume of construction, which, in turn, tends to reflect the country's general prosperity. Annual U.S. consumption of hydraulic cements increased each year from the end of World War II to 1956, amounting in that year to about 327 million barrels. After a few years of high-level but irregualr consumption, the upward trend was resumed. Consumption increased in each successive year from 1960 to 1966; in the latter year, a record 403 million barrels of cement, valued at a record $1.3 billion, was consumed (table 1). Consumption in 1967, however, was about 2 percent less than in 1966.

Compared with the consumption (domestic shipments plus imports) of standard portland cement, that of white portland cement has been small, as is shown in the following tabulation for the years 1962-67:

Year	Apparent U.S. consumption of white portland cement (1,000 barrels)
1962	1,985
1963	2,264
1964	2,420
1965	2,378
1966	2,267
1967	2,278

Consumption of white portland cement, which accounts for less than 1 percent of annual U.S. consumption of all hydraulic cements, is centered in Florida, California, and Texas.

U.S. producers

Early in 1968, 56 firms and their affiliates and subsidiaries were operating 188 portland cement plants in the United States and Puerto Rico. On hundred and two of these plants, accounting for about 59 percent of the capacity, were in continental United States east of the Mississippi River; 82 plants, accounting for about 39 percent of the capacity, were in continental United States west of the Mississippi River; and four plants, accounting for about 2 percent of the capacity, were in Puerto Rico and Hawaii.

Early in 1968 the annual capacity of the 188 portland cement plants was slightly more than 500 million barrels. In recent years, approximately three-fourths of the capacity of the portland cement industry has been used.

Five of the 56 U.S. producers of portland cement produce white portland cement in six plants having a total annual capacity of about 3.0 million barrels; two of these plants are in Pennsylvania, two in Texas, and one each in Florida and California. In 1967 these white portland cement plants produced at the rate of approximately 90 percent of their reported annual capacity.

About two-thirds of the 188 plants producing portland cement early in 1968 also produced masonry cement, while a few firms that did not produce portland cement bought it for use in the manufacture of masonry cement. An additional three plants produced natural and puzzolan cements, bringing to between 190 and 200 the number of plants producing hydraulic cements in the United States. No data are available on the capacity for producing masonry, natural, and puzzolan cements.

Historically, most firms producing hydraulic cement have had few, or no, other important financial interest or products. Beginning in the 1950's, however, a number of hydraulic cement companies--particularly comparatively small one- and two-plant firms--have merged with large, diversified producers of building and related products. In the early 1960's, a trend toward vertical integration began with the acquisition of aggregate and ready-mix concrete producing facilities by cement manufacturers. Conversely, a few important producers of concrete erected their own cement plants.

Approximately 35,000 production and related workers were employed in the production of hydraulic cements in 1967. Only a few hundred of these workers were employed in the production of white portland cement. Because of the trend to automation, the number of workers employed in the manufacture of hydraulic cements has not increased in recent years proportionally with the total plant capacity or the output of the cement industry.

In 1968, U.S. producers of portland cement ranged in size from firms operating single small plants having an annual capacity of less than 1 million barrels to large concerns owning from five to 18 plants, with a total annual capacity of 10 million to 40 million barrels. Although the 10 largest portland cement producers controlled about 55 percent of the total productive capacity, their plants were scattered throughout the United States, and each plant generally competed for sales with several other plants in the same area.

Because of their substantial weight in relation to their value, standard portland cement and similar hydraulic cements can be transported economically for only short distances. Competition, therefore, is localized in a great number of small market areas. Conversely, the considerably higher priced white, nonstaining portland cement can be moved economically over much greater distances.

U.S. production

U.S. production of hydraulic cement was larger in each successive year from 1945 through 1956, when about 326 million barrels, valued at about $1 billion, was produced. In the five years following, 1957-61, the annual U.S. production of hydraulic cements fluctuated from year to year but averaged about the same in terms of quantity, as the amount produced in 1956, although somewhat higher in terms of value. The upward trend of production was resumed in 1962 and continued through 1966, when more than 397 million barrels, valued at slightly more than $1.25 billion, was produced (table 1). Production in 1967 was about 2 percent lower than in 1966.

Production of white portland cement has never exceeded 1 percent of total hydraulic cement production. From 1958 to 1965, however, output of white portland cement grew at a more rapid rate than that of other hydraulic cements as a group. In 1967 about 2.1 million barrels of white portland cement, valued at about $14 million, was produced, compared with some 1.5 million barrels in 1960.

U.S. exports

Beginning in 1961, U.S. exports increased in each successive year through 1966, amounting in the latter year to almost 1.1 million barrels, valued at about $4.8 million (table 1). Annual exports in 1967-68 were slightly under 1 million barrels.

Exports of cement in 1967 consisted largely of standard and special hydraulic cements shipped to Canada, the French West Indies, the Leeward and Windward Islands, Nigeria, the Bahamas, Mexico, and various other countries and areas throughout the world (table 2).

Until the early 1950's, U.S. exports of white cement to countries in the Western Hemisphere accounted for a considerable part of domestic exports of all cements. Exports of this product declined steadily in the 1950's. According to information received from domestic producers, exports of white cement were negligible in the period 1962-68, as were exports of cement clinker.

U.S. imports

By 1955 the U.S. cement industry was having difficulty in meeting domestic demand; as a result, U.S. imports in that year increased to 5.2 million barrels, valued at $14.4 million; in terms of quantity, these imports were equivalent to about 1.8 percent of domestic shipments in that year.

In 1956-62, annual imports generally remained steady at about the 1955 level. Thereafter, in 1963-68, imports fluctuated appreciably, ranging from a low of 3.6 million barrels in 1964 to a record 7.9 million barrels, valued at $17.5 million, in 1968. Nevertheless, the 1968 imports accounted for only about 2 percent of domestic consumption.

In 1965-68 the Bahamas, Canada, Norway, and Colombia were the principal foreign suppliers of standard cement and cement clinker to the United States; these four countries furnished virtually all of the imports of such cement in 1968 (table 3). From time to time, large quantities have entered from Israel, Poland, the Dominican Republic, Sweden, West Germany, Belgium, and Portugal.

In the middle 1950's, much of the imported cement entered areas of chronic shortages, especially southern Florida. After that, imports entered other coastal areas (viz, the New York City metropolitan area, Bridgeport, and Providence). Canadian cement was shipped across Lake Ontario and distributed in the Rochester and Rome areas of upstate New York. In 1967 about 35 percent of the imports of hydraulic cements and cement clinker entered Florida, 34 percent entered New York State, 9 percent entered Puerto Rico, 8 percent entered Virginia, and 6 percent entered Connecticut. Because of high transportation charges, very little imported cement is consumed at points far removed from the seaboard. Thus, direct import competition is encountered almost entirely by domestic concerns which ordinarily ship cement to markets near the seaboard or other border points.

U.S. imports of white, nonstaining portland cement were very small during several years both before and after World War II, but they increased greatly in the middle 1950's owing chiefly to the large demand for this variety in Florida. Imports advanced from 46,000 barrels, valued at $240,000, in 1953 to 448,000 barrels, valued at $2.7 million, in 1957. From 1958 to 1965, annual imports were in the range of 250,000 to 329,000 barrels and accounted for 12 to 20 percent of the white cement used in the United States. The decline in imports which began in 1964 continued through 1967; in the latter year 186,000 barrels were imported (table 4). Imports in 1968, however, were somewhat higher than in 1967. Somewhat less than half of the imports of white portland cement now come from Belgium; the remainder are supplied largely by Japan, Denmark, Colombia, and Mexico.

Imports of cement clinker were negligible until 1955, when localized shortages of kiln capacity, in comparison with grinding capacity, in certain coastal areas resulted in the importation of 467,000 barrels in 1955 and 483,000 barrels in 1956. Since 1956, cement clinker has been imported irregularly, usually to supplement inadequate kiln capacity at certain plants. In recent years, standard cement clinker has been imported for finishing in Maine, Michigan, New York, Alaska, and Illinois, and white cement clinker, for finishing in Pennsylvania. Total imports of clinker declined from about 648,000 barrels in 1966 to 152,000 barrels in 1968.

Table 1.--Hydraulic cement and cement clinker: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

(Quantity in thousands of barrels of 376 pounds; value in thousands of dollars)

Year	Production 1/	Imports	Exports	Apparent consumption	Ratio (percent) of imports to apparent consumption
	Quantity				
1962	347,118	5,759	380	352,497	1.6
1963	365,241	4,030	460	368,811	1.1
1964	383,266	3,633	713	386,186	.9
1965	391,686	5,505	748	396,443	1.4
1966	397,459	7,066	1,069	403,456	1.8
1967	390,271	5,912	980	395,203	1.5
1968	2/	7,860	942	2/	2/
	Value				
1962	1,149,405	13,241	1,853	1,160,793	1.1
1963	1,178,980	10,202	2,072	1,187,110	.9
1964	1,233,349	9,229	3,290	1,239,288	.7
1965	1,244,869	13,523	4,288	1,254,104	1.1
1966	1,251,083	17,846	4,836	1,264,093	1.4
1967	1,238,133	14,699	4,452	1,248,380	1.2
1968	2/	17,489	3,884	2/	2/

1/ Does not include clinker, an intermediate product.
2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Hydraulic cement and cement clinker: U.S. exports of domestic merchandise, by principal markets, 1962-68

Market	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 barrels of 376 pounds)						
Canada	30	111	133	281	495	349	222
French West Indies	4	-	10	76	160	210	349
Leeward and Windward Islands	21	29	34	35	64	104	130
Bahamas	25	133	170	41	33	45	44
Mexico	13	60	62	95	120	37	17
All other	287	127	304	220	197	235	180
Total	380	460	713	748	1,069	980	942
	Value (1,000 dollars)						
Canada	222	608	818	1,916	2,130	1,426	1,117
French West Indies	10	-	23	155	347	509	660
Leeward and Windward Islands	64	82	85	103	180	273	271
Bahamas	110	483	678	200	166	233	217
Mexico	96	238	309	436	504	260	197
All other	1,351	661	1,377	1,478	1,509	1,751	1,422
Total	1,853	2,072	3,290	4,288	4,836	4,452	3,884

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Hydraulic cement (except white, nonstaining portland cement) and cement clinker: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 barrels of 376 pounds)						
Bahamas	-	-	112	1,826	2,587	2,459	3,566
Canada	1,600	1,485	1,459	1,780	2,400	1,693	1,950
Norway	1,163	919	950	954	1,005	878	1,665
Colombia	584	379	540	624	479	444	388
Sweden	118	254	51	1/	-	37	-
Belgium	445	111	41	17	19	12	14
All other	1,532	553	171	54	369	203	62
Total	5,442	3,701	3,324	5,255	6,859	5,726	7,645
	Value (1,000 dollars)						
Bahamas	-	-	268	4,446	6,226	5,951	7,279
Canada	3,907	3,800	3,682	4,352	5,839	4,088	4,837
Norway	2,279	1,808	1,751	1,946	1,981	1,586	3,055
Colombia	1,172	762	1,089	1,206	957	937	758
Sweden	185	409	86	4	-	62	-
Belgium	926	260	106	42	45	30	34
All other	3,268	1,721	833	367	1,802	1,162	493
Total	11,737	8,760	7,815	12,363	16,850	13,816	16,456

1/ Less than 500 barrels.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Quantities reported in pounds have been converted to equivalent barrels of 376 pounds each.

Table 4.--White, nonstaining portland cement: U.S. imports for consumption by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 barrels of 376 pounds)						
Belgium	168	175	167	122	96	80	115
Japan	61	52	55	64	66	52	52
Denmark	21	1/	2	16	8	24	24
Colombia	17	44	51	28	21	13	18
Mexico	18	17	19	10	12	6	3
All other	32	41	15	10	4	11	3
Total	317	329	309	250	207	186	215
	Value (1,000 dollars)						
Belgium	820	794	755	559	471	389	571
Japan	285	216	227	276	290	217	218
Denmark	94	1	8	85	40	123	125
Colombia	83	212	253	140	104	61	91
Mexico	85	74	88	49	59	31	16
All other	137	145	83	51	32	62	12
Total	1,504	1,442	1,414	1,160	996	883	1,033

1/ Less than 500 barrels.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Quantities reported in pounds have been converted to equivalent barrels of 376 pounds each.

Commodity	TSUS item
Concrete mixes	511.21 - .24
Articles of concrete	511.31 - .71

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States is on a moderate net export basis with respect to concrete mixes and a moderate net import basis with respect to articles of concrete as a group. Imports supply more than half of U.S. consumption of concrete floor and wall tiles, whereas imports of other concrete articles are negligible.

Description and uses

Concrete is an important construction material for highways, buildings, dams, bridges, and water systems. For most of these structures, the concrete structural component is produced on the construction site either from hydraulic cement (see summary on item 511.11), aggregate (such as sand, gravel, and crushed stone), and water, or from concrete mixes such as wet ready-mixed concrete and packaged mixtures of hydraulic cement and sand or other aggregate, as well as from wet or dry mixtures of aggregate and asphalt, tar, or other cementitious binder of mineral origin.

(Prior to December 7, 1965, the TSUS provided for binding materials which included resins; headnote 1(b) to part 1A of schedule 5 of the TSUS, however, was amended by Public Law 89-241 to include only "cementing materials of mineral origin".)

About half of the concrete used in the United States is ready-mixed, i.e., the cement, aggregate, and water are charged into separate compartments of the mixer truck which is to transport the material to the job site and the separate ingredients are blended during the latter part of the haul, so that on arrival at the site the wet concrete mix is ready to pour into the prepared forms. Both the basic ingredients used in ready-mixed concrete and the product itself are heavy and of comparatively low value; this factor effectively prevents ready-mixed concrete from moving in any appreciable volume in international commerce.

The packaged dry mixtures of cement and aggregate are used mainly by householders for repair work and other small jobs. Such

mixtures probably account for less than 1 percent of the concrete poured in the United States.

The principal concrete articles not generally produced at construction sites are essentially of hydraulic cement mixed with water and an aggregate (stone chips or slices and/or sand); such articles include floor and wall tiles, roofing tiles, mantels, friezes, blocks, slabs, panels, planks, poles, pipes, and drainage tiles. Except for floor and wall tiles, most of the articles are so heavy, bulky, and low-valued that transportation charges restrict sales to localities close to producing plants. The term "tiles" for the purpose of this summary (see headnote 1(c) to part 1A of schedule 5 of the TSUS) does not include any article 1.25 inches or more in thickness. In determining whether the articles are in chief value of concrete, the value of the reinforcing media, such as steel bars and reinforcing wires, is disregarded.

Concrete floor and wall tiles, which comprise nearly all of the imports considered in this summary, are usually rectangular (most of them square) and are less than 1.25 inches in thickness. The two principal types of concrete floor and wall tiles are "terrazzo" and "cement." Terrazzo tiles are those in which stone chips or slices are used for decorative purposes; such tile must be ground on the top surface to level and polish the chips or slices. Cement tiles are those in which sand, cement, and pigment are used; such tiles usually are not ground on the top surface. Either type may be ground on the back surface to permit accurate placement on thin adhesive beds instead of on thicker hydraulic mortar beds.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Concrete mixes, whether wet or dry:			
511.21	Hydraulic cement concrete.	5% ad val.	3% ad val.	Free
511.25	Other	15% ad val.	12% ad val.	7.5% ad val.
	Articles, including terrazzo, of concrete, with or without reinforcement:			
	Tiles:			
511.31	Floor and wall tiles.	21% ad val.	1/	1/
511.41	Other tiles, including roofing tiles.	26% ad val.	20.5% ad val.	13% ad val.
	Articles, not specially provided for:			
511.51	Of concrete floor and wall tiles, including terrazzo.	12.5% ad val.	10% ad val.	6% ad val.
	Other:			
511.61	Not decorated	15% ad val.	12% ad val.	7.5% ad val.
511.71	Decorated	27% ad val.	21.5% ad val.	13.5% ad val.

1/ Duty status not affected by the 1964-67 trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under

the TSUS from August 31, 1963, through 1967. Also shown (except for item 511.31) are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent (except for item 511.21), are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The duty on hydraulic cement concrete (item 511.21) will be reduced to a free rate in the final stage. The United States did not grant a concession on concrete floor and wall tiles (item 511.31) at the 1964-67 trade conference.

Comment

Concrete mixes.--In 1966 about 4,550 establishments in the United States produced ready-mixed concrete for sale to builders and householders. Most of the producers were small and conducted highly localized operations because of the nature of their product and its low value-to-weight ratio. The value of U.S. shipments of ready-mixed concrete amounted to an estimated $2.4 billion in 1966. Except for a few shipments across the borders of Canada and Mexico, there were no U.S. exports or imports of ready-mixed concrete.

Several ready-mix firms and others produce packaged dry cement-aggregate mixtures. These mixtures, which are low in value relative to their weight, are usually sold within the general area of their manufacture, and both exports and imports of such mixtures are negligible.

Concrete floor and wall tiles.--It is believed that annual consumption of concrete floor and wall tiles in the mid-1960's, which was moderately lower than that in the 1950's, amounted in terms of value, to approximately $2 million, of which about half was accounted for by imports. Exports are known to be negligible.

Many domestic plants producing concrete products have facilities which could be easily converted to the manufacture of concrete floor and wall tiles, but appreciable quantities are produced at probably not more than a dozen plants--mainly in Florida, Texas, and California. This product is usually only one of several concrete products manufactured in these plants. Generally speaking, it is uneconomical to fabricate these small, low-valued tiles in the United States unless there is a large local market for them; most producers of concrete products find it more profitable to cast panels, blocks, slabs, and other large units.

Concrete floor and wall tiles--mostly floor tiles--have been

imported in moderate quantities for many years, but until 1955 the value of U.S. imports seldom exceeded $100,000 in any one year. Beginning after 1954 (when they were valued at about $52,000), imports began a marked upward trend; between 1957 and 1963, they increased to more than $1 million a year, with almost all of the volume coming from Mexico, as shown in the following tabulation:

Year	All countries		Mexico		All other countries	
	Value	Unit value	Value	Unit value	Value	Unit value
	1,000 dollars	Cents per sq. ft.	1,000 dollars	Cents per sq. ft.	1,000 dollars	Cents per sq. ft.
1962----	925	32.1	636	31.5	289	33.4
1963----	1,069	33.7	806	33.1	263	35.4
1964----	1,130	35.7	936	34.9	194	40.3
1965----	1,217	37.0	1,081	37.4	136	34.1
1966----	1,178	32.3	1,030	36.3	148	18.5
1967----	933	37.5	819	38.6	114	34.7
1968----	1,130	34.2	1,019	37.1	111	20.0

In addition to the dollar volume of the tiles shown in the table above, many shipments valued at less than $250 are known to be entered from Mexico; such shipments are not included in official statistics because they are entered informally. Taking into account such unreported shipments, the value of annual imports of concrete floor and wall tiles from Mexico in 1965-66 and again in 1968 was probably about $1.2 million to $1.4 million.

In recent years, two premium-priced kinds of concrete floor and wall tiles have comprised increasing proportions of the imports from Mexico; these tiles are either ground on their backs to uniform thickness, or else include large and comparatively expensive onyx or marble slices embedded therein, rather than the less expensive stone chips. Because of the weighting effect as to value of these higher priced imports, the average unit value of all concrete floor and wall tiles imported from Mexico has increased substantially in the past few years. For tiles similar in quality and composition to those entered in earlier years, however, prices for the Mexican products were at least as low in 1968 as in the early 1960's.

Moderate quantities of terrazzo concrete floor and wall tiles are imported from Italy, while small quantities are supplied by the United Kingdom and two or three other countries (see accompanying table).

All other concrete products.--U.S. production of the miscellaneous products covered in this summary is large, and U.S. imports, which are almost negligible, are far exceeded by exports. Statistics on exports of the concrete products covered herein are combined in export classes that include certain other concrete and cement manufactures. It is known, however, that in 1965-68 annual exports of concrete products covered by this summary amounted to $0.6 million to $1.2 million, about half of which was shipped to nearby points in Canada. Exports consisted in major part of panels, poles, blocks, and similar articles.

Table.--Concrete mixes and articles of concrete: U.S. imports for consumption, by item and by principal sources, 1964-68

(In thousands of dollars)

Item and principal sources	1964	1965	1966	1967	1968
Hydraulic cement concrete	5	14	40	15	48
Canada	5	1	31	1	33
All other	-	13	9	14	15
Other concrete mixes	2	10	19	17	7
United Kingdom	2	7	17	16	-
All other	1/	3	2	1	7
Concrete floor and wall tiles	1,130	1,217	1,178	933	1,130
Mexico	936	1,081	1,030	819	1,019
United Kingdom	65	80	106	75	61
Italy	125	45	40	25	48
All other	4	11	2	14	2
Other concrete tiles	1/	30	9	2	-
Canada	-	30	9	-	-
All other	1/	-	-	2	-
Articles of concrete tiles	4	1	-	-	21
Mexico	2	-	-	-	-
All other	2	1	-	-	21
Other concrete articles, not decorated	103	65	95	54	207
Canada	69	32	77	29	200
Mexico	29	25	2	4	4
All other	5	8	16	21	3
Other concrete articles, decorated	4	9	7	3	20
Italy	2	3	3	-	1/
All other	2	6	4	3	20

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Comparable data not available (except for concrete floor and wall tiles) for the years before 1964.

Commodity	TSUS item
Lime	512.11 - .14

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

After 1960 the United States lost its longtime position as a net exporter of lime. In 1965 the United States imported approximately five times as much lime as it exported. After 1965, imports declined and exports increased, so that by 1968 imports and exports were about equal. Both imports and exports in 1968 were equivalent to substantially less than 1 percent of U.S. consumption.

Description and uses

Quicklime, the only commercially important lime covered by the "other" lime classification (item 512.14), results from the calcination (burning at moderate temperature) of limestone or dolomite rock. 1/ Hydrated lime (item 512.11) is prepared by adding enough water to quicklime to slake it, i.e., to convert its calcium oxide content to calcium hydroxide. Hydrated lime is more stable and safer and easier to handle than quicklime.

Regenerated lime is quicklime obtained by calcining byproduct calcium carbonate formed in the production of paper by the sulfate and soda processes, in the production of calcium carbide, in water softening operations, and in certain other chemical processes. Quicklime and hydrated lime, which are interchangeable for some purposes, are widely used in metallurgy (such as a flux for steel, in the beneficiation of uranium ores, in the densification of alumina sinter, and for the extraction of magnesium and ferrosilicon), in the chemical process industries (for manufacture of alkalies, calcium carbide, insecticides, fungicides, bleaches, and other products); in construction (as mortars, plasters, and stuccos); in agriculture (for neutralization of acidic soils); and for stabilization of road bases, purification of water, disposal of sewage and industrial wastes, and many other purposes.

1/ Dolomite rock that has been burned at high temperatures, i.e., dead-burned, is covered in a separate summary (TSUS items 531.01 to 531.04). Dead-burned dolomite is sometimes called refractory lime.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Lime:			
512.11	Hydrated	3¢ per 100 lbs., including weight of container	1.5¢ per 100 lbs., including weight of container	Free
512.14	Other	2.5¢ per 100 lbs., including weight of container	1.5¢ per 100 lbs., including weight of container	Free

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which for both items result in the elimination of the duty, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

The ad valorem equivalents of the 1968 rates, based on imports in 1968, were 1.7 percent for item 512.11 and 3.3 percent for item 512.14.

U.S. consumption and production

Because quicklime is a perishable product that generally must be used fairly soon after production and with U.S. imports and exports of it, as well as of hydrated lime, being small relative to domestic output, U.S. production of each of these products in any one year approximates consumption.

An industry source has estimated that the annual consumption of lime during the World War II period ranged from about 4 million to 5 million tons 1/ of open-market material and 3 million to 4 million tons of captive material, and that in the postwar period 1946-60 the trend of consumption was irregularly higher, particularly consumption of regenerated lime, the bulk of which is used captively.

Beginning with 1961, data on annual production are considered comparable with those on apparent annual consumption. Apparent annual consumption increased steadily from about 12 million tons in 1962 to about 16 million tons in 1967. Most of the increased consumption was supplied by growing output from commercial producers of open-market lime; in 1967, 62 percent of the total quantity consumed was supplied by open-market lime, whereas in 1962 it had supplied 54 percent.

Largely because of the comparatively high consumption of fluxing lime in basic oxygen steel converters, which are replacing open-hearth furnaces in many steel mills, consumption of lime for steel fluxing tripled between 1962 and 1967, amounting in the latter year to about 4.7 million tons. The lime used for road stabilization has also increased markedly over the past several years, reaching a record of nearly 700,000 tons in 1967. It is believed that lime requirements for both of these uses will continue to increase substantially and more than compensate for some applications in which lime use is not growing or is even declining.

Consumption of lime by the building trades--the principal users before about 1930--has not increased appreciably since the early 1950's, principally because of the competition from gypsum products and portland cement. Also, the consumption of lime in agriculture has declined in the past decade or so because of the widespread availability of cheaper soil-conditioning materials.

Production of lime increased steadily from 11.9 million tons in 1962 to 16.1 million tons in 1967. The stepping up of open-market output and the leveling off of captive production are shown in the following tabulation (in thousands of tons):

Year	Open-Market	Captive	Total
1962----------	6,358	5,537	11,895
1963----------	7,009	5,563	12,572
1964----------	7,706	6,215	13,921
1965----------	8,350	6,268	14,618
1966----------	9,579	6,285	15,864
1967----------	9,896	6,198	16,094

1/ In this summary the word "tons" means short tons, the domestic unit of quantity.

U.S. producers

In 1967 about 195 U.S. plants manufactured quicklime and/or hydrated lime, or recovered regenerated lime; of these, about 105 produced lime for the open market only, 75 for captive use only, and 15 for both open-market and captive purposes. About half of the open-market lime plants are operated by one- or two-plant firms; the remainder are owned by multiplant, geographically widespread companies, more particularly, by large, diversified producers of building materials or chemicals.

Lime for sale in the open market is produced in some 33 States and Puerto Rico, with production centered in Ohio, Michigan, Missouri, Pennsylvania, and Texas; these five States normally account for about 60 percent of the total U.S. output of open-market lime. Substantial quantities of open-market lime are also produced in New York, Alabama, Louisiana, Virginia, and California. In ordinary circumstances, lime is not shipped any considerable distance because of the high cost of transportation relative to the value of the product and because lime plants are widely distributed in the United States.

Regenerated lime is produced in about 24 States, mainly in Florida, Louisiana, Washington, Alabama, Georgia, North Carolina, and South Carolina.

Data are not compiled regularly on the domestic capacity for producing lime. It is believed that open-market facilities had a capacity at the end of 1967 of at least 14 million tons and that facilities existed capable of regenerating and recovering about half that tonnage as byproducts from chemical processing operations. Furthermore, a number of new plants were being built and several plant expansion programs were being implemented.

U.S. exports

U.S. exports of lime have always been relatively low, although prior to 1961 they exceeded imports. After declining to about 17,000 tons in 1963, exports increased progressively in 4 of the next 5 years, to 69,000 tons in 1968 (see table).

Canada takes more than half of the total U.S. exports of lime, mainly special grades not produced in that country; most of the remainder are shipped to other countries in the Western Hemisphere and the Near East.

U.S. imports

U.S. imports of lime have long been small, amounting to only about half of 1 percent of domestic consumption in 1968. Imports increased substantially after 1960, owing largely to shipment from a nearby U.S.-owned plant in Ontario into the Buffalo, N.Y., area and from another Ontario plant into the Detroit, Michigan, area. Imports peaked at 216,000 tons in 1965, and then declined sharply in the next three years (see table).

Historically, Canada has been almost the sole source of U.S. imports of lime. For decades, until 1963, lime was imported from Canada into the State of Washington for use in the pulp and paper industry. However, for the past few years, that industry has been supplied from a domestic plant, and imports into Washington have virtually ceased.

Lime: U.S. production, imports for consumption, and exports of domestic merchandise, 1962-68

Year	Production 1/	Imports 2/	Exports
	Quantity (1,000 short tons)		
1962	11,895	73	20
1963	12,572	91	17
1964	13,921	94	30
1965	14,618	216	40
1966	15,864	151	60
1967	16,094	81	52
1968	3/	73	69
	Value (1,000 dollars)		
1962	155,695	958	660
1963	166,331	1,017	565
1964	185,188	1,123	777
1965	193,333	2,600	942
1966	199,863	1,776	1,195
1967	207,054	973	1,099
1968	3/	898	1,437

1/ Sold or used by producers; includes lime produced from limestone and dolomite rock, as well as regenerated lime obtained as a by-product from chemical processes.
2/ Nearly all from Canada.
3/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Note.--This table does not include dead burned dolomite (sometimes called refractory lime).

Commodity	TSUS item
Gypsum rock	512.21-.24
Gypsum plaster	512.31-.35

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Approximately one-third of the gypsum rock not ground and not wholly or partly calcined that was consumed in the United States in recent years was imported. The United States has been a net exporter of ground or calcined gypsum and of gypsum plaster, although neither the exports nor the imports of such materials have been large.

Description and uses

Gypsum is a natural mineral consisting of hydrous calcium sulfate and small amounts of such impurities as anhydrite, silica, clay, and organic materials. Gypsum rock is by far the most important variety of gypsum from a commercial standpoint; other mineralogical varieties of gypsum are alabaster, selenite, and satin spar. Gypsum rock is found in many countries; the leading producing countries are the United States, Canada, United Kingdom, the U.S.S.R., Spain, and Italy. Sizable quantities of broken or ground gypsum rock are used as a cement setting retarder, a conditioner for reducing soil acidity, a pigment, and as a filler or extender in various materials. Even greater quantities of gypsum rock are calcined for use in the manufacture of various products.

Calcined gypsum, sometimes called plaster of Paris, is produced by heating gypsum rock at a moderate temperature for a period of time sufficient to drive off 1-1/2 of its 2 molecules of water and form a dry, pulverulent material composed almost wholly of calcium sulfate hemihydrate. Calcined gypsum is further manufactured into either commercial plasters, sometimes called cements of gypsum, or prefabricated structural products such as wallboard, lath, or block (item 245.70), or religious statues, statuettes, and other articles (items 512.41 and 512.44). The term "cement of gypsum", as used in the TSUS (items 512.31 and 512.35) refers to cement in chief value of gypsum but containing other substances in addition to calcined gypsum.

Gypsum plasters are divided into two product lines: building plasters and industrial plasters. Building plasters are dry mixtures of a large proportion of calcined gypsum and small proportions of a

set retarding agent and optionally a reinforcing fiber, expanded perlite or other aggregate, lime, and other additives. Industrial gypsum plasters are dry mixtures of calcined gypsum and chemical additives for regulating the viscosity, setting characteristics, product hardness, or other physical properties; these plasters seldom contain filler materials or reinforcing fibers.

Building plasters are widely used for forming surfaces on walls and ceilings. Sizable tonnages of industrial plasters are used in the polishing of plate glass, in molds for casting pottery and other articles, in dental plasters, for the setting of broken human limbs, and for casting into various decorative or utilitarian articles.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Plaster rock or gypsum:			
512.21	Not ground and not wholly or partly calcined.	Free	1/	1/
512.24	Ground, wholly or partly calcined, or both.	$1.19 per ton	95¢ per ton	59¢ per ton
	Cement of gypsum:			
512.31	Valued not over $40 per ton.	$10 per ton	$8 per ton	$5 per ton
512.35	Valued over $40 per ton.	$14 per ton	$11.20 per ton	$7 per ton

1/ Duty-free status not affected by trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions

of about 50 percent on items 512.24 to 512.35, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The duty free rate for the merchandise now provided for under item 512.21 was also free of duty under the Tariff Act of 1930 as originally enacted, and was bound under the GATT (paragraph 1743), effective January 1, 1948.

The ad valorem equivalent of the 1968 specific rate of duty on item 512.24, based on imports in 1968, was 2.1 percent. In recent years there have been no imports under either item 512.31 or 512.35; thus, ad valorem equivalents cannot be computed for these items.

U.S. consumption

Annual U.S. consumption of gypsum rock increased from about 15 million tons 1/ in 1962 to a record high of nearly 17 million tons in 1964. In the years following 1964, consumption declined steadily falling below 14 million tons in 1967 (table 1). The decreasing consumption in recent years largely reflects a sizable decline in the construction of new houses and apartments.

About half of the gypsum rock consumed in the United States in recent years was calcined for use in the production of plasterboard and lath, while approximately one-fourth was calcined and manufactured into industrial and building plasters. 2/ The remainder was consumed in the uncalcined form. Consumption of plasterboard and lath (covered in a separate summary) has increased in recent years, whereas consumption of industrial and building plasters has declined (table 2). About 1.7 million tons of industrial and building plasters were consumed in 1967, in contrast with 3.0 million tons in 1959. The downward trend is due largely to the continuing shift from wet-wall construction (where wet plaster is applied directly to the wall) to dry-wall (plasterboard) construction; dry-wall construction is considerably lower in cost.

U.S. producers

In 1966 gypsum rock was produced in 81 mines situated in 20 States. Eleven gypsum mines were operated in California, eight each in Oklahoma and Texas, six in Colorado, and five each in Arizona,

1/ The term "tons" hereafter refers to short tons, the domestic unit of quantity.

2/ About 4 tons of gypsum rock are needed to produce 3 tons of gypsum plaster.

Michigan, Iowa, and New York; the remainder were scattered throughout the United States. Six or eight large firms own most of the important domestic gypsum mines and gypsum products plants; most of these firms are diversified producers of building materials, including gypsum plaster, plasterboard, and lath. Several of these large firms also own foreign subsidiaries which mine gypsum rock abroad and supply it to the parent U.S. firms.

In 1966 calcined gypsum was produced in 78 plants, 1/ owned by about a dozen companies, in 31 States. Of these 78 plants, some 45 were situated at or near the domestic mines supplying them while the remainder were in populous coastal areas and received their gypsum rock from foreign sources. Nearly every operator of a gypsum products plant owns its own gypsum mine either in the United States or abroad. Three companies own about 50 of the domestic gypsum products plants. In 1966 calcined gypsum was produced at nine plants in California, seven plants each in New York and Texas, and five in Iowa.

In recent years some of the large, multiplant firms have expanded their gypsum products operations by building plants in sections of the country remote from their long-established gypsum products facilities. At present, at least five firms produce and sell gypsum plaster and plasterboard on a nationwide scale.

No data are available on the U.S. capacity to produce gypsum rock, but it is is known that gypsum product manufacturers located away from the ocean can readily produce all the gypsum rock they require. In view of the considerably lower level of consumption of gypsum plaster in recent years than formerly and the recent erection of new plants in different parts of the country for producing gypsum plaster and gypsum board, there probably is a sizable excess of capacity for producing those products.

U.S. production

Annual U.S. production of gypsum rock increased steadily from about 6.6 million tons in 1949 to 10.7 million tons in 1955, declined moderately in the period 1956-58, and then increased to a peak of 10.9 million tons in 1959. In 1962-67, annual output ranged from 9.4 million to 10.7 million tons. In 1966 the largest tonnages of gypsum rock were mined in California, Michigan, Iowas, and Texas, in that order.

1/ Gypsum plaster was produced in each of these 78 plants, as well as in some others which purchased calcined gypsum for formulation into plasters, usually industrial plasters.

The record high production of gypsum plaster was also established in 1959, when about 3 million tons was produced. After 1959 the output of gypsum plasters declined each successive year, and in 1967 the production amounted to only 1.7 million tons. In 1966 building plasters accounted for about 83 percent and industrial plasters for 17 percent of the output of gypsum plasters.

U.S. exports

Only small quantities of gypsum rock have been exported by the United States. U.S. exports of gypsum plasters have also been negligible, amounting to less than 1 percent of domestic production (table 2). A large part of the exports of gypsum plasters went to Canada and Mexico and consisted mainly of industrial plasters which were not produced in the importing country.

U.S. imports

U.S. imports of gypsum rock increased from about 4.0 million tons in 1958 to about 6.3 million tons in 1964; since then, they have been moderately lower (table 3). In 1968 Canada supplied approximately 78 percent of the total imports; Mexico, 16 percent; Jamaica, 4 percent; and the Dominican Republic, 2 percent. Slightly more than one-third of U.S. consumption of gypsum rock was supplied by imports in each of the years 1965-68, and probably also in the years immediately preceding.

No gypsum plaster was imported in 1962-68. Small quantities of a specially prepared calcined gypsum from the United Kingdom and a very finely ground gypsum rock from Canada, however, were imported regularly during those years.

Table 1.--Gypsum rock, not ground and not wholly or partly calcined: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

(Quantity in thousands of short tons; value in thousands of dollars)

Year	Production 1/	Imports	Exports	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1962	9,969	5,421	2/	2/	2/
1963	10,388	5,490	2/	2/	2/
1964	10,684	6,258	2/	2/	2/
1965	10,033	5,911	15	15,929	37
1966	9,647	5,479	21	15,105	36
1967	9,393	4,563	17	13,939	33
1968	2/	5,474	18	2/	2/
	Value				
1962	36,343	10,490	2/	2/	2/
1963	38,138	10,884	2/	2/	2/
1964	38,874	13,292	2/	2/	2/
1965	37,375	11,848	429	48,794	24
1966	35,681	15,761	618	50,824	31
1967	34,383	9,723	697	43,409	22
1968	2/	11,384	651	2/	2/

1/ Crude gypsum rock mined; does not include the small amounts of gypsum produced as a by-product in certain chemical processes.

2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Gypsum plaster and wholly or partly calcined or ground gypsum rock: U.S. production, imports for consumption, and exports of domestic merchandise, 1962-68

Year	Production 1/	Imports 2/	Exports 3/
	Quantity (1,000 short tons)		
1962	2,324	2	18
1963	2,305	3	17
1964	2,257	1	20
1965	2,124	2	13
1966	1,901	2	17
1967	1,666	4/ 2	23
1968	5/	2	21
	Value (1,000 dollars)		
1962	47,799	55	736
1963	48,198	62	669
1964	48,695	53	829
1965	46,065	65	683
1966	42,924	91	844
1967	38,756	86	1,010
1968	5/	89	1,037

1/ Excludes calcined gypsum used by producers in the manufacture of plasterboard, lath, and other fabricated shapes.

2/ Imports consist almost entirely of calcined gypsum; therefore these data are not strictly comparable with production data.

3/ Substantially, but not completely, comparable with production data.

4/ Incorporates revision to eliminate error in official statistics.

5/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 3.--Gypsum rock, not ground and not wholly or partly calcined: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 short tons)						
Canada	4,086	4,399	4,891	4,780	4,381	3,668	4,254
Mexico	599	891	1,073	877	830	656	904
Jamaica	283	169	156	185	172	145	226
Dominican Republic	453	26	111	69	67	87	90
All other	1/	5	27	1/	29	7	1/
Total	5,421	5,490	6,258	5,911	5,479	4,563	5,474
	Value (1,000 dollars)						
Canada	7,473	8,713	10,187	9,501	8,966	7,770	8,976
Mexico	725	1,577	2,124	1,506	5,996	1,065	1,380
Jamaica	1,052	508	584	619	528	505	734
Dominican Republic	1,240	77	360	221	216	282	290
All other	2/	12	50	1	55	101	4
Total	10,490	10,887	13,305	11,848	15,761	9,723	11,384

1/ Less than 500 tons.
2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Articles of plaster of Paris--------	512.41-.44

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. imports of plaster of Paris articles as a group have not been large, and exports have long been negligible. Imports of religious statues and statuettes, however, have accounted for an estimated 15 to 20 percent of U.S. consumption for many years.

Description and uses

Because of its low cost and excellent suitability for molding and casting, plaster of Paris (calcined gypsum) is widely used in making articles--often of intricate shape--which are not required to resist heat, wear, abrasion, or other destructive forces. These articles generally are cast or molded from a thick, aqueous slurry of calcined gypsum, with or without an accelerating reagent and other additives; sometimes, relatively large articles are cast around a wood or metal frame which provides needed rigidity. Most of these articles are used for decorative or religious purposes.

TSUS item 512.41 includes plaster of Paris statues, statuettes, and bas-reliefs, such as (1) figures, figurines, and certain other articles used for religious purposes, (2) figures used for display purposes, busts, and certain types of souvenirs, novelties, and copies of works of art, and (3) bas-reliefs used for architectural purposes. Item 512.44 includes anatomical mannequins, wall masks, plaques, lamp bases, and novelty articles of various kinds. Gypsum or plaster building boards and lath are discussed in the summary on item 245.70.

Articles of plaster of Paris generally encounter competition from similar articles made from a wide variety of other materials (viz, plastics, glass, ceramics, wood, and metals). The selection of a religious article is often based on sentiment for a certain figure or symbol, or on a personal preference for a particular material (plaster of Paris being the most popular), rather than on price. For the other articles, price is generally the principal consideration, although a personal preference for a particular design or material may be a determining factor.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Articles, not specially provided for, of plaster of Paris, with or without reinforcement:			
512.41	Statues, statuettes, and bas-reliefs.	10% ad val.	8% ad val.	5% ad val.
512.44	Other	12% ad val.	9.5% ad val.	6% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of 50 percent on both items, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption

Of the many different types of plaster of Paris articles included in this summary the only type that has been of any considerable commercial importance is religious statues and statuettes (item 512.41). The value of total annual U.S. consumption (i.e., retail sales) of such articles has been estimated to range from $2 million to $3 million. Most of these sales were made at religious shrines and institutions in eastern and midwestern cities having sizable Catholic populations. The annual sales of these religious articles are believed to have been fairly stable in value during recent years.

The value of U.S. sales of bas-reliefs and the several other types of plaster of Paris articles is not known, but it has probably amounted to more than a million dollars a year since 1950. The largest single

item in this category, accounting for annual sales of perhaps $300,000, is believed to have been wall plaques, i.e., cast plaster of Paris pieces having decorative or artistic surface configurations and used, often in pairs, for decorating plastered or wood paneled walls. Because of changing interior decorating styles, sales of plaster-base bas-reliefs have declined to probably less than $100,000 a year. Since about 1960, perhaps $100,000 worth of plaster-base figures and busts used for display purposes have been sold each year.

U.S. producers and production

Religious statues and statuettes of plaster of Paris have been produced by some 20 to 30 small concerns situated mainly in the East and the Midwest. These U.S. producers have frequently supplemented their output of plaster-base religious statues and statuettes with similar imported plaster articles, and in addition, they have produced statues and miscellaneous articles from papier mache and other materials

The number and location of U.S. producers of plaster-base wall plaques, bas-reliefs, figures and busts used for display purposes, and other articles are not known. It is believed that producers of such articles are situated in cities throughout the United States and that plaster of Paris articles usually comprise only a part of the product lines of small companies.

No Government agency or other organization collects and reports separate statistics on the production of the gypsum plaster articles included in this summary. The value of U.S. production of religious statues and statuettes of plaster of Paris has probably approximated $2 million a year since 1955. It is believed that the production of such articles has been steady or has increased only slightly in recent years. The value of production of the other plaster of Paris articles included in this summary has probably amounted to more than $1 million a year since about 1950.

U.S. imports and exports

The value of annual U.S. imports of plaster of Paris statues, statuettes, and bas-reliefs averaged about $407,000 in the period 1962-68 with the record $613,000 worth of such articles entering in 1967 (table 1). About 90 percent of the imports of these articles consisted of religious statues and statuettes, most of which were produced in Spain, Italy, or the United Kingdom. Several other European countries also supplied the religious statuary, the busts, and the bas-reliefs provided for under item 512.41.

Annual U.S. imports of "other" articles of plaster of Paris (item 512.44) have been irregular and comparatively small (table 2); such imports consist principally of decorative articles for walls. For many years Italy was the principal single supplier; imports from that country have declined, however, and in some years Japan, West Germany, Canada, or Mexico has supplied larger amounts, in terms of value, than Italy.

It is unlikely that U.S. exports of religious statues and statuettes of plaster of Paris were ever appreciable. Possibly some wall plaques and other decorative or utilitarian plaster-base articles have been exported in recent years to Canada.

Table 1.--Plaster of Paris statues, statuettes, and bas-reliefs: U.S. imports for consumption, by principal sources, 1962-68

(In thousands of dollars) 1/

Year	Total	Spain	Italy	United Kingdom	Nether-lands	All other
1962	290	100	126	12	26	26
1963	330	140	104	32	18	36
1964	356	148	109	48	18	33
1965	340	133	96	76	12	23
1966	390	187	84	77	6	36
1967	613	359	94	125	5	30
1968	527	298	71	126	2/	32

1/ Quantities not reported.
2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Plaster of Paris articles, not specially provided for: U.S. imports for consumption, by principal sources, 1962-68

(In thousands of dollars) 1/

Year	Total	Italy	Canada	West Germany	All other
1962	52	14	10	2	26
1963	47	7	9	5	26
1964	28	5	1	6	16
1965	20	1	4	3	12
1966	54	2	17	7	28
1967	76	16	8	7	45
1968	126	21	1	9	95

1/ Quantities not reported.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Sand and gravel----------	513.11, -.14

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Annual U.S. consumption of sand and gravel during the period 1963-67 was valued at about $1 billion. U.S. exports were three times as great as imports, but both were very small relative to domestic consumption.

Description and uses

This summary covers sand, crude and manufactured, and gravel, and since these commodities are commingled in their principal applications, the two are discussed jointly here, except where noted otherwise. Ground nepheline syenite is provided for under item 522.43 and is not included in this summary.

The term "sand" is the size designation for very small particles of rock and usually refers to quartz (silica) sand, the most common type of natural sand. Sand is produced by the natural weathering of rocks and by the crushing and sizing operations of sand and gravel producers. Glass sand is sand (item 513.11) that has a minimum silica content of 95 percent and an iron oxide content of not more than 0.6 percent; such sand is used in large quantities as an ingredient in glass batches.

Gravel, like natural sand, is a product of rock weathering. It is composed of somewhat larger fragments than sand.

Virtually all of the sand and gravel deposits in the United States require washing, purification, and sizing to meet consumer requirements. Sand and gravel deposits are widely distributed in the United States, and total reserves are very large.

Sand and gravel are used principally in the manufacture of concrete for building construction and for paving. Large amounts are also used in bituminous paving, as fill material, as railroad ballast, and for a large number of industrial uses. Important uses of the higher-priced industrial sands are as an ingredient in glass and as a casting mold material in iron and steel foundries. Sand is also used in sand blasting, in glass grinding, and the manufacture of ceramics and abrasives.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Sand, crude or manufactured, and gravel:			
513.11	Sand containing by weight 95 percent or more of silica and not more than 0.6 percent of oxide of iron.	50¢ per ton	40¢ per ton	25¢ per ton
513.14	Other	Free	1/	1/

1/ Duty-free status not affected by trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from a concession on item 513.11 granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). No concession was granted in the Kennedy Round on item 513.14. The ad valorem equivalent of the 1968 rate of duty on item 513.11, based on imports in 1968 was 6.9 percent. The duty free rate on sand and gravel, derived from the provisions of paragraphs 1719 and 1775 of the previous schedules, was bound under the GATT, effective January 1, 1948.

U.S. consumption

Apparent consumption of sand and gravel, which increased each successive year during 1962-66, continued the upward trend of the years immediately preceding that period, before declining moderately

in 1967. Such consumption increased from 779 million tons, 1/ valued at $795 million, in 1962, to 936 million tons, valued at $983 million, in 1966 (table 1), representing an increase of 20 percent in tonnage and 29 percent in value. Of the 1966 tonnage, approximately 61 percent was gravel and 39 percent was sand.

Consumption of gravel during 1962-66 averaged 530 million tons a year, which was 20 percent greater than the average for the preceding 5 years. Annual sand consumption averaged 336 million tons, 28 percent above the average for 1957-61.

Consumption of sand and gravel by the construction industry for paving and for building--uses which normally account for about 53 and 30 percent, respectively, of annual consumption--expanded steadily from 1962 to 1966, but declined slightly in 1967; the third largest use, as a fill material, declined after 1965 (table 2). The tonnage consumed in building and paving during 1962-66 averaged 724 million tons a year, 17 percent above the average for the preceding 5-year period.

Consumption of industrial sand in industrial molds and in glass making also has increased in the past few years (table 2). Annual U.S. consumption of molding sands averaged nearly 9 million tons during 1962-66, 41 percent above the corresponding average for 1957-61. Glass makers used an annual average of 8 million tons of sand in the period 1963-67, 23 percent more than the average used for the same purpose in the preceding 5 years. Glass and molding sands normally account for about 70 percent of the annual consumption of industrial sands. The tonnage of sand required annually for the other applications was relatively stable during 1962-66.

The principal products competing with sand and gravel in the major applications are crushed stone, slag, fly ash, and lightweight aggregates such as clay and shale.

U.S. production and producers

U.S. production of sand and gravel closely corresponds to consumption since little of these commodities are held in stock.

Every State reported production of sand and gravel during the period covered herein. During 1962-66, California produced the most sand and gravel, and large amounts were produced in Texas and

1/ In this summary, the term "tons" refers to short tons.

New York as well. The Midwest area, however, was the principal source of these products.

There are two kinds of producers in the United States--commercial operators and Government-and-contractor. Commercial operators sell at least part of their output in the open market, whereas Government-and-contractor operators produce exclusively for use on Federal, State, and municipal projects. Commercial operators accounted for approximately 72 percent of the sand and gravel produced during 1962-66.

In 1967, production was reported from 6,315 commercial plants. About 72 percent of these plants each produced less than 100,000 tons annually, and together accounted for only about 20 percent of domestic production in 1967. About 1 percent of the plants produced more than 1 million tons each and accounted for 12 percent of the 1967 output.

Operations ranged in size from one-man, portable roadside units to multiunit plants of large corporations associated with the construction industry.

U.S. exports and imports

Sand and gravel were not important items in international trade during 1962-68. Both U.S. import and export trade were mainly with Canada and, to a lesser extent, with Mexico and consisted principally of construction sand. U.S. exports normally were three times as great as imports, but imports (table 3) have been increasing at a greater rate than exports in recent years (table 1). Sand suitable for use in the manufacture of glass accounted for approximately 6 to 8 percent of the tonnage and about 14 percent of the value of annual imports.

Table 1.--Sand and gravel: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production			Imports	Exports	Apparent consumption
	Sand	Gravel	Total			
	Quantity (1,000 tons)					
1962	302,748	476,944	779,692	368	1,358	778,702
1963	317,179	507,872	825,051	359	1,489	823,921
1964	330,177	541,567	871,744	484	1,766	870,462
1965	356,304	555,314	911,618	689	1,853	910,454
1966	371,389	566,160	937,549	649	2,321	935,877
1967	362,529	546,165	908,694	632	2,387	906,939
1968	1/	1/	1/	753	2,351	1/
	Value (1,000 dollars)					
1962	332,674	466,162	798,836	511	4,085	795,262
1963	343,057	508,772	851,829	499	4,293	848,035
1964	363,399	535,246	898,645	686	5,105	894,226
1965	393,309	569,365	962,674	879	6,171	957,382
1966	413,015	576,225	989,240	914	7,324	982,830
1967	415,138	570,651	985,789	912	7,235	979,475
1968	1/	1/	1/	1,129	7,737	1/

1/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Construction sand and gravel and industrial sand: U.S. consumption, by principal uses, 1962-67

Year	Construction sand and gravel			Industrial sand	
	Building	Paving	Fill	Molding	Glass
	Quantity (1,000 tons)				
1962	245,961	430,082	58,623	6,981	7,199
1963	258,729	439,783	79,811	7,579	7,204
1964	264,319	464,390	91,842	8,988	7,638
1965	273,586	466,081	118,359	9,831	8,228
1966	284,344	490,792	107,498	10,679	8,823
1967	265,940	489,989	93,181	9,459	8,937
	Value (1,000 dollars)				
1962	285,764	390,101	30,018	18,771	23,847
1963	295,232	490,200	51,500	20,814	23,626
1964	302,624	441,781	50,498	24,240	24,414
1965	316,342	456,816	78,090	26,319	26,154
1966	330,247	470,527	71,199	29,877	27,723
1967	318,263	479,397	62,999	26,934	28,976

Source: Compiled from official statistics of the U.S. Department of Mines.

Table 3.--Sand, crude or manufactured, and gravel: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 short tons)						
Canada	333	336	443	675	630	589	729
Vietnam	-	23	40	11	-	-	-
All other	1/ 35	2/	2/	3	3/19	4/ 43	24
Total	368	359	484	689	649	632	753
	Value (1,000 dollars)						
Canada	422	428	558	804	812	756	984
Vietnam	-	69	125	36	-	-	-
All other	1/ 89	2	3	39	3/ 102	4/ 156	145
Total	511	499	686	879	914	912	1,129

1/ Includes 31 thousand short tons, valued at 63 thousand dollars, from Belgium.
2/ Less than 500 short tons.
3/ Includes 18 thousand short tons, valued at 70 thousand dollars, from Australia.
4/ Includes 43 thousand short tons, valued at 134 thousand dollars, from Australia.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Crushed or ground stone:	
Marble, breccia, and onyx chips	513.21
Slate	513.31
Limestone	513.35-.36
Other	513.41

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States is one of the largest producers and consumers of crushed or ground stone. U.S. imports and exports are negligible compared with consumption.

Description and uses

The term "crushed or ground stone" is used in this summary to designate small fragments and particles of rocks usually produced in crushing and grinding plants and the chips and spalls produced as by-product rock fragments in the blasting and hammering of stones. Not included in this summary are: ground or pulverized limestone to be used in the manufacture of fertilizer (item 480.05); certain finely divided abrasives and abrasive stones provided for in part 1(G) of schedule 5; diamond dust or powder (items 520.19 to 520.31); ground talc and soapstone (item 523.33); and ground Cornwall stone (item 522.45).

Most crushed or ground stone is derived from limestone, basalt, and granite, but such diverse rock types as marble, breccia, onyx, slate, sandstone, dolomite, and others are also used. Owing to its extremely low value-to-weight ratio, crushed or ground stone is normally shipped only very limited distances.

The principal uses for crushed or ground stone are as aggregate in concrete and as roadstone; it is also used in the manufacture of cement, in agriculture, in the production of lime, as railroad ballast, as a flux, and in many other applications. Marble, breccia, and onyx chips are used principally to impart color in terrazzo, a type of flooring composed mainly of stone chips and cement.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conferences (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Stone chips and spalls, and stone, crushed (otherwise than merely to facilitate shipment to the United States) or ground:			
513.21	Marble, breccia, and onyx chips.	10% ad val.	8% ad val.	5% ad val.
513.31	Slate----------	10.5% ad val.	8% ad val.	5% ad val.
	Limestone:			
513.35	Imported to be used in the manufacture of cement.	1/	Free	Free
513.36	Other----------	1/	12¢ per short ton	10¢ per sh. ton 2/
513.41	Other----------	5.5% ad val.	4% ad val.	2.5% ad val.

1/ Previously dutiable under TSUSA item 513.34, which item was deleted on January 1, 1968 (see second paragraph following).
2/ This rate is to become effective on January 1, 1970.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates, except for items 513.35 and 513.36, had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Prior to January 1, 1968, the limestone now covered by TSUSA items 513.35 and 513.36 was provided for under item 513.34. The column 1 rate under previous item 513.34 was 20 cents per short ton from August 31, 1963 to December 31, 1965, 18 cents from January 1, 1966 to December 31, 1966, and 16 cents from January 1, 1967 to December 31, 1967 (see Presidential Proclamations 3694, 3818, and 3822).

Based on imports in 1968, the average ad valorem equivalent of the 1968 rate of duty on item 513.36 was 6.5 percent.

U.S. consumption and production

Apparent annual U.S. consumption of crushed stone rose from 594 million tons, 1/ valued at $850 million, in 1962 to 750 million tons, valued at $1,078 million, in 1966 (see table), then declined slightly in 1967. The rise in consumption was accounted for by the steadily increasing demand for limestone for use as aggregate in concrete, as roadstone, and in cement. Demand for crushed stone in other consuming industries generally rose slightly or remained stable. The principal commodities in competition with crushed stone were sand and gravel, certain kinds of slag, and lightweight aggregates.

U.S. production of crushed stone during 1962-66 increased steadily from 594 million tons, valued at $853 million, in 1962 to 749 million tons, valued at $1,082 million, in 1966. (see table). In 1967, tonnage and value were each down about 3 percent from the 1966 records. Limestone accounts for about 75 percent, basalt and similar rocks for 10 percent, and granite for 8 percent of this tonnage. The remainder consists principally of marble, calcareous marl, and sandstone.

Approximately 89 percent of the granite, as well as 88 percent of the basalt and 62 percent of the limestone, is sold or used by producers as aggregate in concrete and as roadstone. An additional 18 percent of the limestone is sold or used by producers in the manufacture of cement.

During 1962-67, production was recorded in every State, with the Midwest being the major producing area. Pennsylvania, Illinois, and Ohio produced most of the crushed limestone, and New Jersey and Oregon produced most of the crushed basalt and related rocks. Georgia and North Carolina led in the production of crushed granite.

1/ In this summary the term "tons" refers to short tons.

U.S. producers

U.S. producers of crushed stone were of two types: Commercial operators, selling to anyone, and Government-and-contractor operators, which produced material for use only by Federal, State, and local government agencies. Some of the latter type of producers were Government agencies. Commercial operators normally produce more than 90 percent of the annual output of crushed stone.

In 1967, the 3,338 commercial plants that produced crushed stone in the United States ranged in annual production from less than 25,000 tons to more than 900,000. The number of plants in selected size ranges, and the percentage of the total output accounted for by each of those size ranges, are shown in the following tabulation:

Annual production (short tons)	Number of plants	1967 production (percent of total)
Not over 100,000	1,815	7.5
100,000 - 500,000	1,219	44.9
500,000 - 900,000	170	17.2
Over 900,000	134	30.4

The above tabulation shows that 54 percent of the plants accounted for only 7.5 percent of the total output, whereas 4 percent of the largest plants accounted for 30.4 percent.

U.S. exports and imports

Both U.S. exports and imports of crushed stone were of negligible importance in national and international commerce. The bulk of the foreign trade consisted of crushed limestone sent to or imported from Canada for use as a fluxing agent or in the manufacture of cement, and of marble, breccia, and onyx chips, imported chiefly from Italy.

Stone chips and spalls, and stone, crushed or ground: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production	Imports 1/	Exports	Apparent consumption
	Quantity (1,000 short tons)			
1962	594,376	472	736	594,112
1963	632,919	994	874	633,039
1964	660,076	1,601	1,475	660,202
1965	713,423	1,393	1,238	713,578
1966	749,209	2,349	1,483	750,075
1967	727,031	2,275	1,466	727,840
1968	2/	3,059	1,589	2/
	Value (1,000 dollars)			
1962	852,694	650	3,713	849,631
1963	896,791	1,335	3,848	894,278
1964	947,894	1,552	4,092	945,354
1965	1,020,485	1,870	4,860	1,017,495
1966	1,082,175	2,699	6,906	1,077,968
1967	1,054,464	2,736	7,238	1,049,962
1968	2/	3,764	6,572	2/

1/ Does not include imports reported in value only amounting to 1,039 thousand dollars in 1962 and 573 thousand dollars in 1963.
2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerc.

Commodity	TSUS item
Stone articles and stone, not elsewhere enumerated:	
Sculptures, professional, other than originals	513.51
Jet and alabaster articles	513.94
Articles of chalk	514.34
Marble, breccia, and onyx articles	514.81

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. production of these articles is believed to be substantially greater than imports, which in recent years have been declining slightly. Exports are believed to be negligible.

Description and uses

This summary primarily relates to professional sculptures which are not originals and unenumerated articles formed from relatively soft, workable, natural stone--primarily onyx, marble, jet, alabaster, and chalk.

Alabaster is a pure white or attractively colored, fine-grained, compact form of gypsum soft enough to be fashioned easily into lamp bases, book ends, paper weights, vases, urns, and other utilitarian and decorative articles. Much of the white alabaster used commercially is dyed or otherwise artifically colored.

Jet is a black variety of lignite which takes a high polish and is used for ornamental items.

The articles made of chalk, a soft, friable form of natural calcium carbonate, as provided for under item 514.34, comprise cubes, blocks, sticks, disks, and the like.

In the commercial sense, marble includes all calcareous rocks, capable of taking a polish. Marble may be classed in three groups. The first group, which is by far the most important, comprises marble resulting from the recrystallization of limestone; these are the common marbles of commerce and they vary greatly in colors and shades. The second group comprises the onyx marbles, which are essentially calcium carbonate and have a wax-like appearance. The third group is breccia marbles, composed of angular fragments of marble naturally

cemented together with calcite. Statuary and a wide variety of utilitarian, decorative, and artistic articles are fashioned from marble.

The provision covering professional productions by sculptors (item 513.51) encompasses statuary and sculpture of natural stone by sculptors of recognized qualifications, which works are not original within the meaning of item 765.15. Item 513.51 (exclusive of the first 10 castings, replicas, or reproductions of a sculptor's original work) includes: copies of traditional religious figures; copies of sculptures produced by other sculptors; and sculpted fountains or other utilitarian articles. 1/

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
513.51	Stone statuary and sculptures, other than originals, the professional productions of sculptors only.	8% ad val.	6% ad val.	4% ad val.
513.94	Articles of alabaster, of jet, or of alabaster and jet, not specially provided for.	17% ad val.	13.5% ad val.	8.5% ad val.
514.34	Articles of chalk, not specially provided for.	10% ad val.	8% ad val.	5% ad val.
514.81	Marble, breccia, and onyx, and articles thereof, not specially provided for.	21% ad val.	16.5% ad val.	10.5% ad val.

1/ Statuary and sculptures may be imported under certain conditions under the provisions of items 765.15, 766.20, 766.25, 850.70, 851.20, 862.10, and 862.20.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Comment

No data are available on U.S. production or consumption of any of the articles covered in this summary, and information is so sketchy that not even reasonable estimates are possible. Articles covered here range from high-priced professional creations to low-priced, mass-produced novelties. The aggregate value of the consumption of novelty items probably far exceeds that of specialty and luxury items. It is believed that U.S. production of these articles as a whole (but not of stone sculptures) is considerably greater than imports, which currently have a value of about $5 million a year.

The imported stone sculptures classified here come almost solely from Italy, are generally more ornate than those produced in the United States, and have a reputation for superior craftsmanship.

Marble articles, also primarily from Italy, constitute about 75 percent of the imports covered by this summary in terms of value (see table). Imports consist principally of table tops, lamp bases, sculptures, door saddles and finished wainscoting for use in buildings, and innumerable novelty items. Competition between the imported and the domestic marble articles is limited principally to the door saddles and wainscoting.

Little or no naturally occurring chalk, jet, or alabaster of a type suitable for manufacturing articles is found in commercial quantities in the United States. Domestically produced chalk, jet, or alabaster articles would most likely be made from imported rough stone.

The value of U.S. exports is believed to be equivalent to only a small part of the value of imports.

MARBLE, JET, ALABASTER, AND CHALK ARTICLES, AND STONE SCULPTURES, NOT ELSEWHERE ENUMERATED

Marble, jet, alabaster, and chalk articles, not elsewhere enumerated; and professional stone sculptures: U.S. imports for consumption, by item and by principal sources, 1964-68

(In thousands of dollars)

Item and principal source(s)	1964	1965	1966	1967	1968
Sculptures of stone	360	411	363	266	251
Italy	349	406	335	251	237
All other	11	5	28	15	14
Jet and alabaster articles	949	1,055	985	854	932
Italy	933	1,021	959	842	896
All other	16	34	26	12	36
Articles of chalk	4	3	4	1	12
Japan	1	1	2	1/	1
All other	3	2	2	1	11
Marble, breccia, and onyx articles	4,712	4,417	4,062	3,773	4,163
Italy	3,433	3,221	2,941	2,900	3,209
Portugal	890	750	681	555	541
Mexico	119	168	152	161	186
France	85	130	122	39	68
All other	185	148	166	118	159

1/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Comparable data not available for the years before 1964.

STONE, CRUDE, AND NOT SUITABLE FOR USE AS MONUMENTAL, PAVING, OR BUILDING STONE

Commodity	TSUS item
Stone, not suitable for monumental, paving, or building stones:	
Granite, not manufactured	513.61
Limestone, crude	514.11
Other, not manufactured and not elsewhere enumerated	515.41
Jet, not manufactured	513.91

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. imports of crude stone not suitable for use as monumental, paving, or building stone have been declining steadily, in terms of value, since 1962. Exports are believed to be negligible. Consumption, which is substantial, is supplied principally by domestic production.

Description and uses

The stone covered here, not suitable for use as monumental, paving, or building stone, consists almost wholly of large, heavy, irregularly shaped chunks; such material is usually termed "riprap" in the trade. Such stone includes granite, limestone other than that to be used in the manufacture of fertilizer, sandstone, basalt, and other varieties except marble, breccia, onyx, quartzite, slate, and travertine; all of the latter varieties of stone, if in riprap form, are covered in other summaries in this volume. Jet, although previously used for jewelry and trinkets, ordinarily has no other uses than for fill, etc.

Stone riprap is used principally for river and harbor work, such as in spillways of dams, for protection of shorelines and docks, and in other construction which must resist the force of currents, waves, and tides. Another use is as a fill material in roadways and embankments. For the purpose of this summary, the term "crude" is used to denote either "crude" or "not manufactured", as applicable.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
513.61	Granite, not manufactured, and not suitable for use as monumental, paving, or building stone.	Free	1/	1/
513.91	Jet, not manufactured.	Free	2/	2/
514.11	Limestone, crude, not suitable for use as monumental, paving, or building stone.	20¢ per short ton	16¢ per short ton	10¢ per short ton
515.41	Stone, not manufactured, and not suitable for use as monumental, paving, or building stone.	Free	1/	1/

1/ Duty-free status not affected by trade conference.
2/ Duty-free status bound by trade conference, effective January 1, 1968.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted on item 514.11 by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The duty free status of

items 513.61 and 515.41 were not affected by the trade conference. The free rate for item 513.91 was bound in the Kennedy Round.

Based on imports in 1968, the average ad valorem equivalent of the 1968 rate of duty on item 514.11 was 5.6 percent.

Comment

Annual U.S. production and consumption of stone in crude form, not suitable for use as monumental, paving, or building stone, ranged from about 30 million to 40 million short tons during the period 1962-67 (table 1). Domestic production, which is usually incidental to the production of stone for other purposes, is scattered through at least 25 States, particularly coastal States and States located along the Mississippi River and its tributaries. This production consists largely of granite and basalt, with relatively smaller quantities of limestone and other types, except jet; there is no known domestic production of jet of the type covered in this summary. These materials are all of low value, and transportation costs restrict their movement to short distances.

Exports are believed to be negligible.

During the period 1964-68, imports declined from a high of 676,000 short tons in 1964 to a low of about 49,000 short tons in 1967 before increasing moderately in 1968 (table 2). Annual imports in this period averaged 337,000 short tons. Imports are almost all from Canada and Mexico. Usually, the bulk of the imports, in terms of quantity, consist of limestone. There have been no imports of jet in many years.

STONE, CRUDE, AND NOT SUITABLE FOR USE AS MONUMENTAL, PAVING, OR BUILDING STONE

Table 1.--Stone, crude, not elsewhere enumerated, which is not suitable for use as monumental, paving, or building stone: U.S. production and imports for consumption, 1962-68

Year	Production	Imports
	Quantity (1,000 short tons)	
1962	36,415	1/
1963	30,200	1/
1964	39,495	676
1965	38,754	640
1966	36,739	256
1967	30,637	49
1968	1/	62
	Value (1,000 dollars)	
1962	41,835	1/
1963	35,982	1/
1964	49,780	1,032
1965	46,038	754
1966	48,030	438
1967	45,840	240
1968	1/	284

1/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Stone, crude, not elsewhere enumerated, which is not suitable for use as monumental, paving, or building stone: U.S. imports for consumption, by variety, 1964-68

Variety of stone	1964	1965	1966	1967	1968
	Quantity (short tons)				
Granite	237	236	457	269	788
Jet	-	-	-	-	4
Limestone	675,443	624,983	251,955	41,605	20,911
Other 1/	353	14,671	3,760	7,561	40,765
Total	676,033	639,890	256,172	49,435	62,468
	Value (1,000 dollars)				
Granite	3	3	11	11	18
Jet	-	-	-	-	2/
Limestone	1,015	729	351	122	68
Other 1/	14	21	75	107	198
Total	1,032	753	437	240	284

1/ Does not include marble, breccia, onyx, travertine, quartzite, and slate.

2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--No strictly comparable data are available for the years prior to 1964.

Commodity	TSUS item
Monumental, paving, and building stone:	
Granite	513.71, -.74
Limestone	514.21, -.24
Marble, breccia, and onyx	514.51, -.54, -.57, -.61, -.65
Travertine	515.21, -.24
Stone, not elsewhere enumerated	515.51, -.54

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. production of monumental, paving, and building stone is large; annual sales usually amount to $85 million to $95 million. U.S. imports, valued at $10 million to $13 million a year, are five to six times as large as exports.

Description and uses

The stone included in this summary is often used for monumental, paving, and building purposes, some varieties to a greater extent than others. For granite, limestone, and those stones not specially provided for by name in the TSUS, there are separate tariff provisions for the stone suitable for use as monumental, paving, or building stone and that which is not suitable for such uses. A separate tariff provision (item 515.24) also covers "travertine, hewn, sawed, dressed, polished, or otherwise manufactured" which is "suitable for use as monumental, paving, or building stone". Travertine in the unmanufactured state, however, is covered in a single tariff provision (item 515.21) without respect to its suitability or nonsuitability for use as monumental, paving or building stone. In accordance with its tariff classification, all unmanufactured travertine is covered in this summary. Likewise, no distinction is made in the tariff provisions relating to marble, breccia, and onyx based on suitability for use as monumental, paving, or building stone, and for that reason the marble, breccia, and onyx coming within the particular tariff descriptive provisions whether or not suitable for monumental, paving, or building uses are included in this summary. Although slate has some uses similar to those of the stones described above, the quarrying, processing, and major uses of slate are substantially unlike those of most monumental, paving, and building stone, and slate and articles thereof are covered in other summaries in this volume (see summaries covering items 515.11 to 515.14 and item 513.31). Quartzite is also covered in a separate summary.

The term "monumental, paving, or building stone", 1/ as applied to natural stone, generally refers to stone sold in blocks or slabs of specified shapes and usually of specified sizes, including roughhewn, sawed, cut or carved blocks for the foundation and walls of buildings, roofing and flooring slabs, cut and polished memorial stone, paving and curbing blocks, and some special products consisting wholly or mainly of slabs or blocks of stone, such as stone steps, sills, and tanks fabricated from pieces of stone. As applied to marble, the term "slabs" in items 514.61 to 514.65 means flat stone pieces, not over 2 inches thick, having a facial area of 4 square inches or more, whether or not cut to size or rubbed or polished on one or both surfaces, but with edges not beveled, rounded, or otherwise processed except to facilitate installation as tiling or veneering in building construction (headnote 2, part 1C, schedule 5 of the TSUS).

It has been administratively determined that granite grave markers, tombstones, monuments, and memorials are classifiable as "pitched, lined, pointed, hewn, sawed, dressed, polished, or otherwise manufactured" granite suitable for use as monumental stone, under item 513.74 rather than as articles of granite under item 513.81 or 513.84 (T.D. 66-94(20)). The marketing of granite grave markers, tombstones, and finished monuments, however, is closely associated with that of stone articles and monuments of other stone and is discussed in the summary in this volume covering stone and articles of stone not elsewhere enumerated. Stone quarried by the wire-sawing method is considered to be sawed stone for tariff purposes; hand-chiseled edges are "hewn, sawed, dressed, polished, or otherwise manufactured." In determining whether stone is suitable for use as monumental, paving, or building stone, various considerations are taken into account, including whether the stone is "capable of being squared" for such use, whether all four edges are polished (building stone ordinarily does not have all edges polished), and whether the edges have been beveled or rounded other than for the purpose of installation in building construction.

The principal mineralogical varieties of stone used for monumental, paving, and building purposes are these:

Granite, a crystalline igneous rock
Marble, a metamorphosed and recrystallized limestone
Limestone, a consolidated sedimentary calcium carbonate
Sandstone, a consolidated sand
Travertine, a crystalline calcium carbonate deposited out of the waters of springs.

1/ In this summary the term "shaped" is sometimes used in lieu of "monumental, paving, and building."

Basalt, diabase, diorite, serpentine, onyx, and breccia are also used to a limited extent.

The different mineralogical varieties of stone have distinguishing physical characteristics which enable experienced persons to identify them readily, frequently even with respect to State or country of origin. Generally speaking, granite is noted for hardness and durability; marble and travertine, for distinctive colors and patterns; and limestone and sandstone, for durability and economy. Granite is used principally in block form for monumental purposes and in block and slab form in large public and commercial buildings; marble and travertine, in slab form for decorating interior and exterior surfaces and for making decorative utilitarian items, 1/ such as table tops; limestone in massive block form, for public and commercial buildings; and sandstone in slab form, as an exterior facing for private and public buildings.

Monumental, paving, and building stone is removed from quarries by various methods. Large quarry blocks are split from the ledges of rock mainly either by channeling and wedging or by drilling and broaching, or the blocks are cut free with wire saws or oxygen-kerosene jet flames. Large quarry blocks are usually cut into smaller sizes before removal to mills. In the mills, the blocks are cut to predetermined shapes and sizes by machines that saw, plane, joint, grind, turn, or flute.

Monumental, paving, or building stone is used for exterior and interior parts of buildings; in monuments, bridges, revetments, and foundations; as curbing, paving, and flagging; and for other architectural and engineering purposes. For economic reasons, the use of stone as a load-bearing structural unit has declined, and stone producers now specialize in the production of non-load-bearing, thin veneer slabs for both exterior and interior use.

The choice of a particular stone for a given use depends on many factors. Physical characteristics such as workability, strength, and durability are of paramount importance. The stone must have good resistance to weathering processes, fire, abrasion, and the chemical action of cleaning solutions. Other factors include the reputation of the stone and the dealer, and his ability to furnish sizable tonnages of uniform color, texture, and soundness. Esthetic qualities are also important in both exterior and interior stone used in buildings and monuments. Exterior stone, except veneer, usually need not be as attractive in color and texture as stone for interior use. Monumental stone must be free of flaws, have pleasing color and texture, and take and retain a high polish.

1/ Articles of marble are covered in a different summary in this volume; see summary on marble, jet, alabaster, and chalk articles, and stone sculpture, not elsewhere enumerated.

Other materials, such as plain concrete, brick, stainless steel, aluminum, porcelain-enameled steel, plastics, ceramic veneers, glass, and exposed aggregate concretes are being used to an increasing extent rather than stone for architectural and engineering purposes.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Granite, suitable for use as monumental, paving, or building stone:			
513.71	Not pitched, not lined, not pointed, not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.	1¢ per cu. ft.	Free 1/	1/
513.74	Pitched, lined, pointed, hewn, sawed, dressed, polished, or otherwise manufactured.	12.5% ad val.	10% ad val.	6% ad val.
	Limestone, suitable for use as monumental, paving, or building stone:			
514.21	Not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.	2¢ per cu. ft.	1¢ per cu. ft.	1/
514.24	Hewn, sawed, dressed, polished, or otherwise manufactured.	21% ad val.	16.5% ad val.	10.5% ad val.

See footnotes at end of tabulation

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Marble, breccia, and onyx:			
514.51	Marble, breccia, in block, rough or squared only.	27.5¢ per cu. ft.	22¢ per cu. ft.	13.5¢ per cu. ft.
514.54	Onyx, in block, rough or squared only.	32.5¢ per cu. ft.	26¢ per cu. ft.	16¢ per cu. ft.
514.57	Marble, breccia, or onyx, sawed or dressed, over 2 inches thick.	50¢ per cu. ft.	40¢ per cu. ft.	25¢ per cu. ft.
	Slabs:			
514.61	Not rubbed and not polished in whole or in part.	5.5% ad val.	4% ad val.	2.5% ad val.
514.65	Rubbed or polished in whole or in part.	7% ad val.	5.5% ad val.	3.5% ad val.
515.21	Travertine, not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.	10.5¢ per cu. ft.	8¢ per cu. ft.	5¢ per cu. ft.
515.24	Travertine, hewn, sawed, dressed, polished, or otherwise manufactured, and suitable for use as monumental, paving, or building stone.	21% ad val.	16.5% ad val.	10.5% ad val.

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Stone, not elsewhere provided for, suitable for use as monumental, paving or building stone:			
515.51	Not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.	2¢ per cu. ft.	1¢ per cu. ft. 2/	1¢ per cu. ft. 2/
515.54	Hewn, sawed, dressed, polished, or otherwise manufactured.	21% ad val.	16.5% ad val.	10.5% ad val.

1/ Full concession became effective on Jan. 1, 1968.
2/ Final concession rate became effective Jan. 1, 1969.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown where applicable are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent on all items except item 513.71, are being put into effect in five annual stages (except for item 513.71, 514.21 and 515.51) (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The rate on item 513.71 was made free of duty in the first stage. The full concession granted on item 514.21 also became effective in the first stage, while that on item 515.51 was effective in two stages.

The ad valorem equivalents of the 1968 rates, based on imports in 1968, were as follows for the items in this summary dutiable at specific rates:

Item	Percent
514.21	0.6
514.51	2.9
514.54	.7
514.57	4.9
515.21	3.0
515.51	.9

U.S. consumption

The value of annual U.S. consumption of all types of monumental, paving, and building stone combined (except slate) is about $100 million. Insofar as may be surmised from available data, consumption peaked in 1963-64 for the period 1962-67 and was moderately lower in the three succeeding years.

Consumption of the individual types of monumental, paving, and building stone also is inconclusive of any particular trends. Consumption of shaped granite increased substantially in terms of value, to more than $40 million in 1967, compared with a stable annual consumption valued at about $35 million reported for 1962-66. It has been estimated that about 60 percent of the output of shaped granite is used in monuments (predominantly grave markers), 30 percent in high-quality nonresidential buildings, and 10 percent in curbing, flagging, and paving applications.

The value of annual U.S. consumption of shaped limestone varies from $15 million to $18 million, while that of annual consumption of the marble-breccia-onyx group is probably in the range of $20 million to $25 million; by far the bulk of consumption in the latter group is represented by marble. Annual consumption of the miscellaneous stones, principally sandstone, included under items 515.51 and 515.54, was valued at about $15 million in 1966-67, some 15 to 20 percent less than in 1963.

U.S. producers

The number of producers of monumental, paving, and building stone is not known with exactness. The 1963 Census of Mineral Industries reported that 551 firms operated quarries for producing such rough stone; these totals were approximately the same as those shown in the 1958 Census of Mineral Industries. Of the 551 companies operating

such quarries, about 42 percent had facilities for dressing stone; most of the output from the remaining quarries was shipped to local fabricators throughout the country. The quarry-dressing plant combinations were much larger, on the average, than the nonplant quarries and hence accounted for the bulk of the output.

In 1966, monumental, paving, and building granite was produced at 158 quarries in 21 States. The major granite quarrying and finishing operations are concentrated in one-industry rural areas in Vermont, Massachusetts, South Dakota, Georgia, Minnesota, North Carolina, and Wisconsin. Granite not dressed to final form at the quarry is generally shipped to small local fabricators, principally finishers of grave markers.

Limestone for monumental, paving, and building purposes was quarried at 102 locations in 24 States in 1966, with about two-thirds of the output coming from 18 quarries in Indiana, largely in the Bedford area. Wisconsin and Minnesota also have active limestone operations.

Sandstone for building uses was produced in 1966 at 191 quarries in 29 States; Ohio, Pennsylvania, and New York were by far the largest producing States.

In 1966, production of marble slabs and other shapes was accounted for by 36 quarries situated in 15 States, principally Vermont, Georgia, Missouri, and Tennessee.

An unrecorded number of quarries produced the remaining types of monumental, paving, and building stone.

U.S. production

The long-term trend in the value of annual U.S. production of all types of monumental, paving, and building stone combined is moderately upward; this trend is also apparent for most types individually, although over a shorter period of time production may fluctuate considerably and even decline for a few years. Thus, the value of overall production declined from nearly $88 million in 1963 to $80 million in 1966 but regained most of that loss in 1967 (table 1).

The value of the annual output of shaped granite increased from an average of about $28 million in 1957-61 to an average of $33 million in 1962-66 (table 2). The value of production increased sharply in 1967 to $39 million. Between 8 and 12 percent of the output of granite, in terms of value, comes from each of the following States: Vermont, Massachusetts, South Dakota, Georgia, and Minnesota.

The value of the annual production of shaped limestone in 1962-66 ranged from about $19 million in 1964 to $17 million in 1962 (table 3), and averaged $18 million; the annual average in 1957-61 was also about $18 million. About 60 percent of the value of the output is usually accounted for by Indiana, and 10 percent each, by Wisconsin and Minnesota.

The value of the annual output of monumental, paving, and building marble (including minor amounts of breccia and onyx) has shown wide fluctuation in the past few years, ranging from $21 million in 1963 to $14.4 million in 1966 (table 4). In terms of value, the principal producing States in 1966 were Vermont, Georgia, Missouri, and Tennessee, in that order.

The value of the annual output of monumental, paving, and building sandstone usually ranges from $10 million to $12 million, approximately half of which is accounted for by Ohio and one-fourth by New York and Pennsylvania combined. Shaped sandstone accounts for about three-fourths of the value of "other" stone shown in table 5. Production of the remaining unspecified types of dimension stone is generally valued at $3 million to $4 million a year.

U.S. exports

Prior to 1965, all types of rough and dressed monumental, paving, and building stone were combined in export data; beginning with that year, separate data have been reported for "unworked" (i.e., rough split or squared) and "worked" (i.e., shaped or polished or both). About 45 percent of the exports shown in table 1 are accounted for by unworked stone, and 55 percent, by worked stone. Data are not available showing exports by type of stone, although it is believed likely that granite and marble are the major types exported.

The bulk of the U.S. exports of such stone go to Canada.

U.S. imports

In terms of value, the United States imports approximately five times as much monumental, paving, and building stone as it exports. In the period 1962-68, the value of annual imports ranged from about $8.7 million in 1962 to nearly $12.9 million in 1968 (table 1). Italy supplied more than half of total imports.

Imports of shaped granite have been highly irregular in recent years (table 2). In 1963-67, annual imports of such granite had an average value of $2.2 million. Imports were valued at $4.2 million

in 1968, with Canada and Italy accounting for the major share of the increase. Although the United States obtains granite from many countries, Canada has improved its position as a supplier and now furnishes about half of total U.S. imports of granite. One-fourth to one-third of the granite imports come from Italy.

Imports of monumental, paving, and building limestone are negligible (table 3).

Imports of shaped marble (including minor amounts of breccia and onyx) reached a peak value of nearly $8 million in 1964 (table 4), after several years of steady growth. Marble imports were progressively lower in each of the 3 succeeding years and in 1967 amounted to $5.5 million; in 1968, they amounted to $7.1 million. About three-fourths of the imported marble slabs and other shapes comes from Italy, and most of the remainder, from Portugal.

Imports of "other" types of monumental, paving, and building stone, consisting almost wholly of travertine from Italy, had an average value of about $1.5 million a year in 1963-67, ranging from $1.4 million in 1965 to $1.8 million in 1963 (table 5).

Table 1.--Monumental, paving, and building stone (except slate): U.S. production, imports for consumption, and exports of domestic merchandise, 1962-68

(In thousands of dollars)

Year	Production	Imports	Exports 1/
1962	82,597	8,696	1,679
1963	87,643	10,402	1,593
1964	87,251	2/ 11,983	1,966
1965	82,172	10,584	2,662
1966	79,946	10,501	2,372
1967	85,255	9,498	3/ 2,100
1968	4/	12,872	1,879

1/ Consists mainly of marble and granite, the bulk of which go to Canada. Producer-reported exports of shaped slate stone have been subtracted from officially reported shaped stone exports, which include slate.

2/ Estimated, to eliminate an error in source data.

3/ Partly estimated.

4/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Granite dimension stone: U.S. production, and imports for consumption, total and by principal sources, 1962-68

(In thousands of dollars)

Year	Production	Imports for consumption			
		Canada	Italy	Other	Total
1962	32,012	268	244	1,103	1,615
1963	32,796	774	276	1,114	2,164
1964	33,752	942	496	833	2,271
1965	33,135	992	462	602	2,056
1966	33,847	980	475	519	1,974
1967	39,000	1,599	444	620	2,663
1968	1/	1,979	1,451	772	4,202

1/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Limestone dimension stone: U.S. production, and imports for consumption, total and by principal sources, 1962-68

(In thousands of dollars)

Year	Production	Imports for consumption			
		Canada	Italy	Other	Total
1962	16,847	1/	1/	1/	1/
1963	18,134	1/	1/	1/	1/
1964	18,944	105	7	3	115
1965	17,172	18	8	9	35
1966	18,270	52	12	5	69
1967	16,552	49	24	2	75
1968	2/	33	10	3/	43

1/ Not separately classified prior to August 31, 1963.
2/ Not available.
3/ Less than $500.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Marble, breccia, and onyx dimension stone: U.S. production, and imports for consumption, total and by principal sources, 1962-68

(In thousands of dollars)

Year	Production	Imports for consumption			
		Italy	Portugal	Other	Total
1962	18,739	4,392	524	713	5,629
1963	21,002	4,676	970	789	6,435
1964	19,245	5,318	1,534	1,089	7,941
1965	17,277	5,008	1,611	477	7,096
1966	14,419	4,780	1,844	319	6,943
1967	16,086	4,058	1,154	325	5,537
1968	1/	5,451	1,263	357	7,071

1/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Dimension stone, 1/ other than granite, limestone, marble, breccia, onyx, and slate: U.S. production, and imports for consumption, total and by principal source, 1962-68

Year	Production	Imports for consumption 2/		
		Italy	Other	Total
1962	14,999	1,402	50	1,452
1963	15,711	1,751	52	1,803
1964	15,310	1,607	49	3/ 1,656
1965	14,588	1,335	62	1,397
1966	13,410	1,500	15	1,515
1967	13,617	1,183	40	1,223
1968	4/	1,517	39	1,556

1/ Includes sandstone, travertine, greenstones, gneisses, schists, and all other types of dimension stone not excepted in the title of this table.

2/ Virtually all travertine. Includes small amounts of limestone in 1962 and 1963.

3/ Estimated, to eliminate a major error in source data.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Articles of stone, not elsewhere enumerated:	
Granite	513.81, -.84
Limestone	514.41, -.44
Travertine	515.31, -.34
Other	515.61, -.64

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Although no statistics are available, U.S. production of articles of stone, not elsewhere enumerated, is known to be much larger than imports. U.S. imports have shown no specific trend, and exports are believed to be negligible.

Description and uses

This summary primarily covers a wide variety of articles made from granite, limestone, travertine, and "other stone" (sandstone, freestone, traprock, and the like). Articles of marble, breccia, and onyx (item 514.81); of alabaster and jet (item 513.94); and of slate (item 515.14) are included in other summaries in this volume.

Among the different types of stone articles covered in this summary are: disassembled mausoleums and crypts; table tops; window sills; pedestals; lamp bases; unassembled fireplaces; and non-professional carvings of animals and biblical or other figures. Also covered are grave markers, tombstones, and monuments of other stone than granite. Although such articles of granite are excluded from the tariff classification, they are discussed in this summary because of their close relationship with these articles made from other stone (see the summary on monumental, paving, and building stone). Stone articles are "decorated" by such means as ornamental carving, enamelling, coloring, and painting.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Stone and articles in chief value of stone, not specially provided for:			
513.81	Granite, not decorated.	15% ad val.	12% ad val.	7.5% ad val.
513.84	Granite, decorated----	27% ad val.	21.5% ad val.	13.5% ad val.
514.41	Limestone, not decorated.	15% ad val.	12% ad val.	7.5% ad val.
514.44	Limestone, decorated--	27% ad val.	21.5% ad val.	13.5% ad val.
515.31	Travertine, not decorated.	15% ad val.	12% ad val.	7.5% ad val.
515.34	Travertine, decorated.	27% ad val.	21.5% ad val.	13.5% ad val.
515.61	Other stone, not decorated.	15% ad val.	12% ad val.	7.5% ad val.
515.64	Other stone, decorated.	27% ad val.	21.5% ad val.	13.5% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to a reduction of 50 percent on each item, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Comment

The value of U.S. consumption of the stone articles covered here is not known. Granite grave markers and other finished granite monuments probably comprise the bulk of the total consumption. The remainder consists chiefly of high-quality utilitarian and decorative

articles whose production involves specialized labor in costly and time-consuming work.

U.S. producers range from large, fully integrated quarriers and finishers of granite monuments to small, one-man shops scattered throughout the country. It is impossible to make a reasonable estimate of the number of producers because of the multitude of articles involved and the wide variety of producers.

U.S. exports, not separately reported in official statistics, are believed to be negligible.

During 1964-68 the value of annual U.S. imports ranged from $473,000 in 1964 to $353,000 in 1967 (see table).

In 1968, "other" stone articles, not decorated, accounted for approximately 33 percent of the total value of imports, and travertine articles, not decorated, and granite articles, not decorated, for about 17 percent each. Italy was the most important supplier of most of these items.

Articles of stone, not elsewhere enumerated: U.S. imports for consumption, by types, 1964-68

(In thousands of dollars)

Type of article	1964	1965	1966	1967	1968
Granite:					
Not decorated	23	62	70	60	66
Decorated	10	2	3	11	7
Limestone:					
Not decorated	20	3	16	22	10
Decorated	27	28	33	26	21
Travertine:					
Not decorated	249	152	111	73	64
Decorated	10	5	1	4	4
Other stone: 1/					
Not decorated	71	87	138	128	126
Decorated	63	39	28	29	84
Total	473	378	400	353	382

1/ Does not include articles of alabaster, jet, marble, breccia, onyx, and slate, or of statuary which are the production of professional sculptors.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Quartzite, whether or not manufactured------	514.91

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. imports of quartzite are small compared with domestic production and fluctuate widely from year to year.

Description and uses

Quartzite is any natural rock composed of quartz grains fully cemented together, mainly with silica. The purer grades, which contain only small amounts of associated minerals, are used as a flux in the smelting of copper ores, as a filler for acid towers in the chemical industry, and as an ingredient in the manufacture of glass. Low-iron quartzite is employed as a mill liner or grinding medium in the comminution of ores, ceramic batches, and various other raw materials. A special form of quartzite called ganister is the principal raw material for the manufacture of refractory silica brick. Quartzite containing large amounts of impurities is utilized as concrete aggregate, railroad ballast, and roadstone.

U.S. tariff treatment

Item 514.91 continues the duty-free status of quartzite as provided for under paragraph 1775 of the original Tariff Act of 1930. The duty-free status was bound under the GATT in 1948.

Comment

The greatest quantity of quartzite is used in road construction; the use of this material, which has a low unit value, depends on its economic availability to nearby highway construction. U.S. consumption of the second most important type, refractory grade quartzite, is dependent on the level of operations of silica brick-lined furnaces in the metals extraction and conversion industries.

Annual U.S. production of refractory grade quartzite in 1962-67 increased from 389,000 short tons in 1962 to 533,000 short tons in 1965 but decreased to 354,000 short tons in 1967 (see table).

Owing to high transportation costs of quartzite relative to value, U.S. exports and imports are fairly small. Export statistics are not separately reported. During the period 1963-67 U.S. imports ranged from 132,000 short tons in 1966 to 3,000 short tons in 1967 (see table). Annual imports in this period averaged 62,000 short tons, in contrast with an average of 69,000 short tons for the preceding 5-year period. Imports were very small in 1968. Canada was the main source of imports.

Quartzite, whether or not manufactured: U.S. production and imports for consumption, 1962-68

Year	Production 1/	Imports 2/
	Quantity (1,000 short tons)	
1962	389	94
1963	411	5
1964	438	63
1965	533	72
1966	369	132
1967	354	3
1968	3/	7
	Value (1,000 dollars)	
1962	5,129	296
1963	5,040	73
1964	4,493	249
1965	5,501	357
1966	3,655	547
1967	4,924	198
1968	3/	273

1/ Refractory grade quartzite only. Data on other grades are not separately reported; production of such other grades, however, was probably more than twice as much, in terms of quantity, as output of refractory grade quartzite.

2/ Data does not include shipments from Brazil, which are believed to be Brazilian pebble.

3/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports are not separately reported.

Commodity	TSUS item
Roofing slate	515.11
Slate, and articles of slate, not elsewhere enumerated	515.14

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. imports of the commodities covered by this summary consist almost entirely of slate articles and have a value equivalent to about one-fifth that of U.S. production of slate and articles of slate, while U.S. exports, likewise almost all in the form of articles, are equivalent in value to less than one-tenth of the value of imports.

Description and uses

This summary covers slate in its various forms, including blocks, slabs, and sheets, and slate articles, but excludes slate flour and granules, which materials are provided for under TSUS item 513.31 and included in another summary in this volume, namely "Crushed or Ground Stone."

Slate is a fine-grained metamorphic rock that varies widely in color and is characterized by a more or less perfect cleavage in one direction, enabling it to be split readily into sheets of small thickness and comparatively large lateral dimensions. Slate is usually dark gray to blue, although some varieties are light gray, red, green, or purple.

Thin slabs of slate ranging in thickness from 1/8-inch to 3/8-inch used for roofing, as well as slate shingles, are included under item 515.11. This provision had its origins in the exclusionary language to the concession made under paragraph 235 of the previous tariff schedules (note proclamation relating to General Agreement on Tariffs and Trade of 1956 (T.D. 54108)). Other slate, slate articles, and articles in chief value of slate (all provided for in item 515.14) include such articles as billiard table tops, blackboards and writing slates, grave vaults and covers, laboratory sinks and hoods, electrical panels, switchboards, and a wide variety of shapes for interior structural uses, such as mantels, window sills, steps, stair

risers, baseboards, wainscoting, and floor tile. 1/ Irregular slabs of slate are used for flagging or stepping stones.

Slate encounters strong competition from other building materials and utilitarian products, many of which are lighter in weight and less expensive. Roofing slate competes with wood, asbestos cement products, and composition shingles and roll roofing. In blackboard applications, boards made of plaster, glass or synthetic compositions may be used in place of slate. For most structural applications slate competes with other stone, ceramic tile, brick, metal, glass, and especially concrete.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Slate, and articles of slate:			
515.11	Roofing slate-----	25% ad val.	20% ad val.	12.5% ad val.
515.14	Other not specially provided for.	10.5% ad val.	8% ad val.	5% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968. These rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions

1/ The comprehensive term "millstock" is used in the slate industry to include forms of structural slate except roofing, as well as a variety of slate shapes, suitable for special uses, such as blackboards, electrical panels, and billiard table tops.

of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Comment

During the period 1962-67, apparent U.S. consumption of slate increased every year, in terms of value, from about $8 million in 1962 to about $12 million in 1967. In that period, millstock accounted for about 45 percent of the total value but only about 20 percent of the quantity. Roofing slate, flagstones, and miscellaneous uses each accounted for about 18 percent of the total value.

Slate encounters strong competition from other building materials and utilitarian products, many of which are lighter in weight and less expensive.

Of the approximately 50 U.S. producers of slate and slate articles, 21 are situated in Vermont, 11 in New York, and 9 in Pennsylvania, with most of the remainder in Maine or Virginia.

During the period 1962-67, U.S. production of slate and slate articles increased gradually, in terms of value, from $7.4 million in 1962 to $9.6 million in 1967 (see table). Average annual production in this period amounted to $8.8 million, markedly above the level of output of the late 1950's and early 1960's.

During the 5-year period 1962-66, the value of annual U.S. exports of the commodities covered here, averaged $78,000, compared with an annual average of $208,000 in 1957-61. Slate exports were valued at $37,000 in 1968.

U.S. imports of slate and slate articles increased sharply, in terms of value, from $0.6 million in 1962 to $2.3 million in 1967 before declining moderately in 1968 (see table). Annual imports in 1957-61 had an average value of only $348,000.

Imports of slate and slate articles are believed to consist predominantly of billiard table tops, blackboards and slabs for further fabrication. Imports come mainly from Italy and Portugal.

Slate, other than crushed slate, and articles of slate: U.S. production, imports for consumption, and exports of domestic merchandise, 1962-68

(In thousands of dollars)

Year	Production	Imports 1/	Exports
1962	7,441	582	116
1963	8,055	1,066	76
1964	9,086	1,401	60
1965	9,276	1,320	76
1966	9,173	1,479	64
1967	9,605	2,333	37
1968	2/	2,131	2/

1/ Principally from Italy and Portugal.
2/ Not available.

Source: Production and exports from official statistics of the U.S. Bureau of Mines; imports from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Mica, not manufactured	516.11, 516.31, -.41
Mica splittings	516.51
Mica film	516.61

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States is the world's largest consumer of unmanufactured mica; imports supply the bulk of U.S. requirements (usually valued from $5 million to $7 million a year).

Description and uses

Mica comprises a group of aluminum silicate minerals which are characterized by an exceptional cleavage, permitting ready separation into thin sheets. Its main characteristics are flexibility, toughness, transparency, chemical stability, low heat conductivity, and high dielectric strength, i.e., the ability to withstand high voltage without puncturing. Muscovite and phlogopite are the two principal varieties of mica used in industry. Chemically, muscovite is potassium aluminum silicate, and phlogopite is magnesium aluminum silicate. Muscovite is the more important in terms of quantities consumed. Man-made mica is also within this summary.

In its natural state, mica occurs in books or crystals of various sizes and thicknesses, usually embedded in rock formations. After the mica is removed from the ground it is carefully hand cobbed to remove adhering rock and then carefully sorted and rifted, i.e., split into thin sheets about 1/8 inch or less in thickness. After being rifted, the sheets are trimmed and otherwise prepared by hand with the use of knife or scissors.

Trimmed mica, commonly known as uncut or unmanufactured sheet mica, is further processed into blocks, films, or splittings. TSUS items 516.11 and 516.41 cover all mica in an unmanufactured state, not cut or stamped to dimensions, shape or form, which is neither waste and scrap valued at 5 cents or less per pound nor split block mica. Block mica consists of sheets ranging in thickness from 0.007 to 0.040 inch with a minimum usable area of 1-1/2 by 2 inches. Split block mica (item 516.31)--as defined in headnote 1(b) to subpart D, part 1, of schedule 5 of the TSUS--is mica, not cut or stamped, not exceeding 0.020 inch in thickness, that has been split and selected within a tolerance of 8 mils.

Film mica (item 516.61) is derived from the best quality trimmed sheet mica split to thicknesses ranging from 0.00125 to 0.006 inch. Mica splittings (item 516.51) as defined in headnote 1(c) to subpart D, part 1, of schedule 5 of the TSUS, are mica laminae in book-form or book-pack, or in loose pack, suitable for use in the manufacture of built-up mica.

Block mica, split block mica, and film mica are important materials for use in the manufacture of many items, among which are electrical commutators, armatures, radio and radar tubes, radio condensers, diaphragms for oxygen-breathing apparatus, gage-glass gaskets for high temperature boilers, and marker dials for navigation compasses. These forms of mica are also used as parts for electric irons, toasters, water heaters, and other electrical appliances and equipment.

Mica splittings are used almost entirely in making built-up mica, which, as defined in headnote 1(d) to subpart D, part 1, of schedule 5 of the TSUS, means electrical insulating plates, sheets, and tapes, whether or not attached to paper, cloth, or other backing, consisting of reconstituted mica, whether or not treated with resins or of a layer of mica splittings and bonding material.

Although many varieties of manmade micas have been developed since 1950, few have proved feasible for commercial use. Manmade micas are relatively expensive, less flexible than natural mica, and not readily split into the thin platelets used in manufacturing many mica products.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Mica not manufactured (including mica over 0.006 inch in thickness, not cut or stamped to dimensions, shape, or form, and split block mica):			
516.11	Untrimmed phlogopite from which no rectangular piece over 2 inches long or 1 inch wide may be cut.	5% ad val.	4% ad val.	2.5% ad val.
516.31	Split block mica------	Free	1/	1/
516.41	Other----------	4¢ per lb.	2¢ per lb.	Free
516.51	Mica splittings---------	Free	1/	1/
516.61	Mica, not over 0.006 inch in thickness, not cut or stamped to dimensions, shape, or form.	Free	1/	1/

1/ Duty-free status not affected by the trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968. The rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States on TSUS items 516.11 and 516.41 in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to a reduction of 50 percent on item 516.11 and the elimination of the

duty on item 516.41, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The ad valorem equivalent of the 1968 rate, based on imports in 1968, was 2.2 percent for item 516.41.

U.S. consumption

During the period 1962-67, apparent annual U.S. consumption of unmanufactured mica, not including mica waste and scrap, ranged from 11.8 million pounds, valued at $8.2 million, in 1962 (table 1) to 7 million pounds, valued at more than $4 million, in 1967.

Data from the U.S. Bureau of Mines show that annual U.S. consumption of block (including split-block) and film mica during the period 1962-66 ranged from 2.3 million pounds, valued at $2.8 million, in 1963 to 2.8 million pounds, valued at $3.6 million, in 1966 (table 2). Average annual consumption of such mica in this period amounted to about 2.6 million pounds, valued at $3.2 million, whereas the average for 1957-61 was 2.9 million pounds, valued at $4.1 million. In 1967, consumption declined to about 2 million pounds, valued at about $2.8 million. The decline in consumption is attributed to a reduction of mica requirements through the miniaturization of electrical and electronic components and to the substitution of alternative materials, such as ceramic insulators.

During 1962-66, annual U.S. consumption of mica splittings, which consisted entirely of imported material, ranged from 6.7 million pounds, valued at $2.6 million, in 1963 to 8.3 million pounds, valued at $3.7 million, in 1965, and averaged 7.3 million pounds, valued at $3.1 million. The annual average for 1957-61 was 6.5 million pounds, valued at $3.1 million. Consumption in 1967 amounted to 6.2 million pounds, valued at $2.8 million.

Certain grades and qualities of mica have been stockpiled by the U.S. Government as strategic and critical material. As of January 1, 1968, the national stockpile of block mica amounted to about 15.4 million pounds; that of film of all qualities, to about 1.9 million pounds; and that of splittings, to about 50 million pounds. Government inventories of block mica and mica splittings are in excess of the stockpile objectives as determined by the Office of Emergency Preparedness, the inventory of mica film is less than the objective. In addition, some 4.6 million pounds of ungraded and unsorted domestically mined mica of less than strategic and critical grade is maintained in inventory.

The Congress has authorized the General Services Administration (GSA) to sell the surplus stockpile of mica. The GSA has offered to sell 1 million pounds of mica annually as follows: Mica splittings, 735,000 pounds; mica block, 255,000 pounds; and mica film, 10,000 pounds. Sales of various amounts of mica began in late 1967.

U.S. producers and production

In the United States, mica mining is confined largely to a few well-defined areas. In 1960, sheet mica was produced in the United States by about 250 mines, many of them small, part-time operations. The ending of Government purchasing programs in June 1962 resulted in the closing of most facilities for the mining of domestic sheet mica. During 1966 only one mine was actively producing sheet mica. Muscovite mica is the only variety of mica produced in the United States.

In 1962 the United States produced 363,000 pounds of sheet mica, valued at $13 million. Production fell to a nominal 4,000 pounds, valued at $1,000, in 1966 (table 1). Owing to the large amount of skilled labor required in preparing sheet mica for market, it is uneconomical to produce sheet mica in the United States. Most of the domestically mined sheet mica used by U.S. fabricators consists of roughly trimmed, low-quality pieces, generally referred to in the United States trade as punch and circle mica.

U.S. exports

U.S. exports of unmanufactured mica, except waste and scrap mica, are nominal. Part of the exports consist of reexports of previously imported sheet mica.

U.S. imports

During the period 1962-67, annual U.S. imports of all types of unmanufactured mica and mica films and splittings, in terms of value, averaged $6.2 million, ranging from $7.5 million in 1966 to $4.0 million in 1967 (table 1). In 1968, imports amounted to 6.5 million pounds, valued at $3.1 million. The United States is dependent on imports for almost all its requirements of better quality unmanufactured mica and mica films and splittings, the major portion of which are supplied by India.

Imports of unmanufactured block mica, excluding split block mica, declined from 943,000 pounds, valued at $1.2 million, in 1964 to 484,000 pounds, valued at $500,000, in 1968 (table 3). Brazil supplied about 43 percent of the total quantity of these imports in 1967.

During the period 1964-68, annual imports of split-block mica increased steadily from 1.3 million pounds, valued at $1.2 million, in 1964 to 2.5 million pounds, valued at $2.9 million, in 1966, then fell to 1.1 million pounds, valued at $1.0 million, in 1968 (table 3). In the same period, imports of mica film increased from 94,000 pounds, valued at $338,000, in 1964 to 291,000 pounds, valued at $832,000, in 1966, then fell to 98,000 pounds, valued at $233,000, in 1968.

In 1968 India supplied about 41 percent of the quantity of mica film imported and about 38 percent of that of split-block mica imported. Brazil supplied 62 percent of the quantity of split-block mica imported in 1968.

Annual imports of mica splittings have been irregular in recent years, partly because of fluctuating acquisitions for the U.S. stockpile and partly because of the subsequent uncertainty about the continuing availability of the Indian material at a reasonable price. During the period 1964-68, annual imports of splittings averaged 6.9 million pounds. In 1968 India supplied more than 96 percent of the total quantity of mica splittings.

Foreign production and trade

India accounts for about three-fourths of the total quantity of unmanufactured sheet mica (not including waste and scrap) entering world trade. All Indian mica is muscovite, with splittings accounting for more than 50 percent of the total export value. A factor that has enabled India to maintain its primary position as the major mica producer is the country's large reserve of high-grade mica and its abundant supply of experienced and inexpensive labor. High-quality muscovite is produced in the State of Bihar, while lower qualities are mined in the States of Andhra, Pradesh, and Rajasthan.

Indian Government actions have in recent years affected exports of most qualities of natural mica. Among these actions have been the setting of minimum export prices, the levying of an export duty, the banning of exports on a consignment basis, granting of shipments only on irrevocable letter of credit for 100 percent of invoice value, and compulsory Government inspection of mica. These regulations have been initiated to increase foreign exchange earnings and to stimulate domestic fabrication of mica.

Other countries producing muscovite mica are Argentina, Brazil, the Republic of South Africa, and Tanzania. Brazilian producers are making special efforts to take advantage of the Indian situation, and Brazil has become the second largest producer of sheet mica.

The world's largest producer of phlogopite mica is the Malagasy Republic. The only other important commercial source of phlogopite mica is in Canada. Trade in phlogopite mica has been diminishing because of the increased use of other materials.

Table 1.--Mica, not manufactured (except waste and scrap), and mica films and splittings: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production	Imports	Exports	Apparent consumption
	Quantity (1,000 pounds)			
1962	363	11,897	431	11,829
1963	103	9,447	594	8,956
1964	243	10,867	543	10,567
1965	716	11,980	1/	2/
1966	4	10,337	1/	2/
1967	20	6,730	1/	2/
1968	2/	6,519	2/	2/
	Value (1,000 dollars)			
1962	1,299	7,112	166	8,245
1963	13	6,179	148	6,044
1964	58	5,674	161	5,571
1965	185	6,535	1/	2/
1966	1	7,518	1/	2/
1967	2/	3,989	1/	2/
1968	2/	3,113	2/	2/

1/ Not separately reported; small amounts included in exports of ground mica.

2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Block and film mica and mica splittings: U.S. consumption, 1962-67

Year	Block and film mica	Mica splittings
	Quantity (1,000 pounds)	
1962	2,811	6,728
1963	2,293	6,687
1964	2,618	7,608
1965	2,659	8,260
1966	2,813	7,100
1967	1,972	6,188
	Value (1,000 dollars)	
1962	3,490	2,813
1963	2,782	2,588
1964	3,002	3,149
1965	3,188	3,701
1966	3,642	3,221
1967	2,757	2,759

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Table 3.--Mica, not manufactured, and mica films and splittings: U.S. imports for consumption, by types, 1964-68

Type	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)				
Mica, not manufactured:					
Block mica	943	653	728	592	484
Split-block mica	1,325	1,658	2,520	1,141	1,129
Mica film	94	209	291	112	98
Mica splittings	8,505	9,460	6,798	4,885	4,808
Total	10,867	11,980	10,337	6,730	6,519
	Value (1,000 dollars)				
Mica, not manufactured:					
Block mica	1,192	849	1,139	669	500
Split-block mica	1,242	1,527	2,853	1,320	1,041
Mica film	338	666	832	300	233
Mica splittings	2,902	3,493	2,694	1,700	1,339
Total	5,674	6,535	7,518	3,989	3,113

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Waste and scrap mica	516.21-.24

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Apparent U.S. consumption of waste and scrap mica, which is supplied almost entirely by domestic production, averaged about $3.3 million a year during 1962-66. U.S. imports and exports are both negligible in comparison with domestic production.

Description and uses

Mica that is not usable as sheet mica 1/ because of being too small or containing gross imperfections, fractures, or mineral inclusions is considered scrap mica. Waste mica is mica obtained from shops where mica articles are cut or stamped from sheet mica. For tariff purposes, such mica valued over 5 cents per pound is considered as mica not manufactured, under item 516.41. In the United States, mica schist (mica too small in size to be considered sheet mica) is mined for use as scrap mica. In the trade this mica is usually referred to as flake mica. The term "scrap mica" is used hereinafter to cover all the forms of waste and scrap mica.

Scrap mica may be either muscovite, a potassium variety of mica, or phlogopite, a magnesium variety of mica; however, there is no use for which either variety is preferred.

Scrap mica is usually ground before being used, although some specially delaminated scrap mica is used to make reconstituted mica. 2/

1/ For the definition of the term, "sheet mica" see the summary in this volume on mica, not manufactured, and mica film and splittings.

2/ See the summary in this volume on built-up mica and articles of mica not elsewhere enumerated (items 516.91 and 516.94).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Mica not manufactured and mica scalings, mica cleanings, and other mica waste and scrap:			
	Waste and scrap valued not over 5 cents per pound:			
516.21	Phlogopite	12.5% ad val.	10% ad val.	6% ad val.
516.24	Other	12.5% ad val.	10% ad val.	6% ad val.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations, concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Comment

During 1962-66, apparent annual consumption of scrap mica, in terms of quantity, showed no specific trend, while value increased steadily from year to year. Average annual consumption of scrap mica in this period was about 233 million pounds, with a value of $3.2 million. In terms of quantity, 93 to 99 percent of total U.S. consumption of scrap mica was supplied from domestic sources.

During 1962-67, U.S. production of scrap mica, excluding factory waste, increased from 215 million pounds in 1962 to 241 million pounds in 1965, then declined to 237 million pounds in 1967 (table 1). In terms of value, annual production during this period increased steadily from $2.6 million in 1962 to $3.7 million in 1966, then declined to $2.9 million in 1967. More than half of this mica was produced in North Carolina; substantial quantities were also produced in Georgia, Alabama, and South Carolina. In 1966, waste and scrap mica was produced by 27 companies at 32 mining operations.

U.S. exports of scrap mica are not classified separately in official statistics and are believed to be small, if any.

Annual U.S. imports of scrap mica during 1962-67 decreased from a high of 16.3 million pounds, with a value of $132,000, in 1963 to 1 million pounds, with a value of $25,000, in 1967, then increased to 3 million pounds, valued at $76,000 in 1968 (table 2). Imports of muscovite scrap from India, which had been the major foreign supplier for many years, declined from 14.1 million pounds in 1963 to 216,000 pounds in 1967 (table 3) mainly because of a substantial increase in that country's established export price. Imports from Brazil, the only other major foreign source of muscovite scrap mica, have declined since 1966. In most years about 90 percent of the total imports consisted of muscovite waste scrap; Canada was the principal source of phlogopite mica.

Table 1.--Waste and scrap mica valued not over 5 cents per pound: U.S. production, imports for consumption, and apparent consumption, 1962-68

Year	Production	Imports	Apparent consumption
	Quantity (1,000 pounds)		
1962	215,404	8,916	224,320
1963	218,646	16,300	234,946
1964	229,458	5,465	234,923
1965	240,510	3,043	243,553
1966	226,266	2,642	228,908
1967	237,006	1,016	238,022
1968	1/	3,097	1/
	Value (1,000 dollars)		
1962	2,639	55	2,694
1963	2,776	132	2,908
1964	3,353	71	3,424
1965	3,468	71	3,539
1966	3,733	71	3,804
1967	2,876	25	2,901
1968	1/	76	1/

1/ Not available.

Source: Production, compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Waste and scrap mica valued not over 5 cents per pound: U.S. imports for consumption, by types, 1962-68

Type	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)						
Phlogopite	-	225	629	331	346	120	93
Other mica	8,916	16,075	4,836	2,712	2,296	896	3,004
Total	8,916	16,300	5,465	3,043	2,642	1,016	3,097
	Value (1,000 dollars)						
Phlogopite	-	7	12	11	16	2	5
Other mica	55	125	59	60	55	23	71
Total	55	132	71	71	71	25	76

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Waste and scrap mica valued not over 5 cents per pound: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)						
Brazil	99	958	1,682	1,949	1,090	665	260
India	8,383	14,112	3,361	672	909	216	2,564
Canada	-	181	203	296	200	64	-
All other	434	1,049	220	126	443	71	273
Total	8,916	16,300	5,466	3,043	2,642	1,016	3,097
	Value (1,000 dollars)						
Brazil	2	21	36	45	27	16	6
India	50	94	24	13	24	6	61
Canada	-	6	6	9	5	1	-
All other	3	11	5	4	15	2	9
Total	55	132	71	71	71	25	76

Source: Compiled from official statistics of the U.S. Department of Commerce

Commodity	TSUS item
Mica, cut or stamped--------	516.71, -.73, -.74, -.76, -.98

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Apparent annual U.S. consumption of cut or stamped mica averaged 2.9 million pounds during 1962-66. Imports of cut or stamped mica not over 0.006 inch in thickness (mica films) supplied more than 50 percent of the annual consumption of mica films, whereas imports of other cut or stamped mica supplied only a minor part of annual consumption. Exports were negligible.

Description and uses

Mica is cut or stamped from natural sheet mica 1/ to specified dimensions, shapes, or forms. With the exception of fuse discs, most mica is cut or stamped to customer specifications, and few standardized articles are made. The cut or stamped mica may be a finished article ready for incorporation into electrical or electronic apparatus or equipment, or it may require further processing, such as splitting to a specified thickness or the addition of rivets or other parts. Perforated or indented mica articles, as imported, usually require splitting to a specified thickness to be ready for installation, whereas fuse discs, split to thickness, are ready for immediate use. Most of the other imported articles of cut or stamped mica usually require the addition of metal parts before they are ready for use.

The principal uses for cut or stamped mica are as components in capacitors and electronic tubes. Other important uses are in electrical apparatus, household and industrial electrical heating apparatus, and as gage glass gaskets and insulating material in electrical appliances.

Also included in this summary are Canadian articles which are original motor-vehicle equipment comprising cut or stamped mica and articles not specially provided for of mica.

1/ See the summary, in this volume, on mica, not manufactured, and mica films and splittings (items 516.11, 516.31-.61) for the definition of the term "sheet mica" and certain other terms, such as "block mica", used in this summary.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Mica, cut or stamped to dimensions, shape, or form, whether or not perforated or indented, and whether or not dedicated to a specific use:			
516.71	Not over 0.006 inch in thickness.	22.5% ad val.	18% ad val.	11% ad val.
	Over 0.006 inch in thickness:			
	Not perforated or indented:			
516.73	Fuse discs, split to thickness.	25% ad val.	20% ad val.	12.5% ad val.
516.74	Other	40% ad val.	32% ad val.	20% ad val.
516.76	Perforated or indented.	25% ad val.	20% ad val.	12.5% ad val.
516.98	Any article described in the foregoing or in item 516.94, if Canadian article and original motor-vehicle equipment. 2/	Free	1/	1/

1/ Duty-free status not affected by trade conference.
2/ See headnote 2, part 6B, schedule 6, TSUSA-1969.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968. The rates on items 516.71 to 516.76 had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967,

under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent on each item, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

Item 516.98 became effective as to articles entered on or after January 18, 1965, under the provisions of the Automotive Products Trade Act of 1965 (Public Law 89-283). This item covers mica cut or stamped to dimensions, shape, or form and articles not specially provided for, of mica. This item was not negotiated in the Kennedy Round of trade negotiations.

U.S. consumption, producers and production

During the period 1962-66, apparent annual U.S. consumption of cut or stamped mica was relatively stable, ranging from 2.4 million pounds in 1963 to 3.0 million pounds in 1966 (table 1). The average annual consumption for that period was approximately 2.8 million pounds; that for the preceding 5-year period was 3.0 million pounds. Consumption for 1967 was about 2.1 million pounds.

During 1966, about 71 percent of all qualities of block and film mica consumed in the United States were used in electronic applications, principally as parts for tubes and capacitors (table 2). A reduction in requirements for mica, through miniaturization of electrical and electronic components, was an important factor in limiting growth in the consumption of fabricated mica.

In 1966, 15 plants, situated in nine states, fabricated mica. There were three plants each in the States New Jersey, New York, and North Carolina, and one each in Illinois, Massachusetts, Ohio, Pennsylvania, Rhode Island, and Virginia.

Average annual production of cut or stamped mica (made principally from imported sheet mica) during each of the periods 1957-61 and 1962-66 was 2.7 million pounds. During 1962-66, annual domestic production reached a high of 2.8 million pounds in both 1962 and 1966 (table 1). The low for that period was 2.3 million pounds in 1963. Production in 1967 slumped to about 2.0 million pounds.

The U.S. Bureau of Mines shows separate data on the production of fabricated block and cut film mica. Annual production of cut film mica during 1962-67 averaged about 85,000 pounds and never exceeded 9 percent of the combined output of fabricated block and film.

U.S. exports and imports, and foreign production

Because the United States depends on imports for its supply of uncut sheet mica and because mica articles are not standardized, exports of cut or stamped mica are small.

During the period 1962-68, imports of cut mica showed no distinct trend; they averaged 163,000 pounds a year, with a value of $1.7 million. In 1968, imports of cut mica not over 0.006 inch thick and perforated mica over 0.006 inch thick accounted for 99,000 pounds and 69,000 pounds, respectively (table 3). In contrast, the value of cut mica not over 0.006 inch thick was more than $1.4 million, whereas that of perforated or indented mica over 0.006 inch thick was only $122,000. Imports of fuse discs, split to thickness over 0.006 inch thick were about 50,000 pounds, with a value of $64,000. Imports of mica not perforated or indented and over 0.006 inch thick accounted for 2,000 pounds, with a value of $5,000.

No imports of Canadian articles which are original motor-vehicle equipment have been reported for item 516.98. India, the principal foreign producer of cut or stamped mica, was the most important U.S. supplier in 1968 (table 4). Cut or stamped mica is also imported from Mexico, the United Kingdom, Brazil, and Belgium.

Table 1.--Mica, cut or stamped to dimensions, shape, or form: U.S. production, imports for consumption, and apparent consumption, 1962-68

(In thousands of pounds)

Year	Production	Imports	Apparent consumption
1962	2,811	1/ 141	2,952
1963	2,293	1/ 116	2,409
1964	2,618	108	2,726
1965	2,659	168	2,827
1966	2,813	232	3,045
1967	1,972	159	2,131
1968	2/	220	2/

1/ Partly estimated.
2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce, except as noted.

Note.--There are no exports of any appreciable quantities.

Table 2.--Block and film mica: U.S. consumption by end-product uses, 1962-67

(In thousands of pounds)

Year and form	Electronic uses				Nonelectronic uses			Grand total
	Capacitors	Tubes	Other	Total	Gage glass and diaphragms	Other	Total	
1962:								
Block	9	1,552	55	1,616	9	1,102	1,111	2,727
Film	84	-	-	84	-	1/	1/	84
Total	93	1,552	55	1,700	9	1,102	1,111	2,811
1963:								
Block	11	1,356	44	1,411	18	766	784	2,195
Film	68	-	-	68	-	30	30	98
Total	78	1,356	44	1,479	18	796	814	2,293
1964:								
Block	21	1,348	260	1,629	24	896	920	2,549
Film	70	-	-	70	-	-	-	70
Total	91	1,348	260	1,699	24	896	920	2,619
1965:								
Block	24	1,476	230	1,730	28	818	846	2,576
Film	82	-	-	82	-	-	-	82
Total	106	1,476	230	1,812	28	818	846	2,658
1966:								
Block	26	1,700	186	1,912	30	782	812	2,724
Film	89	-	-	89	-	-	-	89
Total	115	1,700	186	2,001	30	782	812	2,813
1967:								
Block	203	1,049	40	1,292	28	515	543	1,835
Film	47	-	4	51	-	86	86	137
Total	250	1,049	44	1,343	28	601	629	1,972

1/ Less than 500 pounds.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Table 3.--Mica, cut or stamped to dimensions, shape, or form: U.S. imports for consumption, by types, 1962-68

Type	1962 1/	1963 1/	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)						
Mica, cut or stamped, not over 0.006 inch thick	99	71	45	89	140	66	99
Fuse discs, over 0.006 inch thick	27	26	4	25	57	24	50
Not perforated, over 0.006 inch thick	2	1	2	1	1	1	2
Perforated, over 0.006 inch thick	13	18	57	53	34	68	69
Total	141	116	108	168	232	159	220
	Value (1,000 dollars)						
Mica, cut or stamped, not over 0.006 inch thick	1,687	1,180	845	1,788	2,687	1,049	1,444
Fuse discs, over 0.006 inch thick	150	120	9	47	106	42	64
Not perforated, over 0.006 inch thick	8	6	15	7	16	16	5
Perforated, over 0.006 inch thick	75	66	187	160	133	109	122
Total	1/ 1,920	1/ 1,372	1,056	2,002	2,942	1,216	1,635

1/ Partly estimated.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 4.--Mica, cut or stamped to dimensions, shape, or form: U.S. imports for consumption, by types and principal sources, 1968

Total	India	Mexico	United Kingdom	Rhodesia	Other	Total
	Quantity (1,000 pounds)					
Mica, cut or stamped, not over 0.006 inch thick	87	4	2	-	6	99
Fuse discs, over 0.006 inch thick	48	-	1/	-	2	50
Not perforated, over 0.006 inch thick	2	-	-	-	1/	2
Perforated, over 0.006 inch thick	20	4	-	17	28	69
	Value (1,000 dollars)					
Mica, cut or stamped, not over 0.006 inch thick	1,211	123	62	-	48	1,444
Fuse discs, over 0.006 inch thick	59	-	1	-	4	64
Not perforated, over 0.006 inch thick	3	-	-	-	2	5
Perforated, over 0.006 inch thick	31	23	-	14	54	122

1/ Less than 500 pounds.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Mica, ground or pulverized----------	516.81

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

Apparent annual U.S. consumption of ground or pulverized mica averaged 108,000 short tons during the period 1962-66. The United States is a net exporter of such mica, and imports constitute less than 0.1 percent of domestic consumption.

Description and uses

Ground mica 1/ is produced by the wet or dry grinding of mica waste and scrap or mica schists. Ground mica is a light, flaky powder which when dry-ground has a dull appearance, but when wet-ground has a glistening sheen. Dry-ground mica is used principally as a coating for rolled roofing, asphalt shingles, and welding rods; as a filler in plastics; in the manufacture of cement for filling joints in wallboard construction; and as a filler and mold lubricant in the vulcanizing of rubber.

Wet-ground mica, which sells at prices 2-1/2 to 3 times those for dry-ground mica, is used principally where its characteristic glistening sheen is desired. The principal uses for wet-ground mica are as a pigment extender in paints, as artificial snow, and in the manufacture of wallpaper. Other uses are as a filler in hard rubber and as a mold lubricant and dusting agent in the manufacture of rubber tires.

1/ In this summary, the term "ground mica" refers to ground or pulverized mica.

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
516.81	Mica, ground or pulverized.	12½% ad val.	10% ad val.	6% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968; which rate had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of about 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption

During the period 1962-66, apparent U.S. consumption of ground mica ranged from 123,000 short tons, valued at $7.0 million, in 1965 to 98,000 short tons, valued at $5.3 million, in 1966. Average annual consumption during that period amounted to about 111,000 short tons, valued at $6.2 million (table 1). Consumption in 1967 amounted to 90,000 short tons, valued at $5.0 million. The 5-year average for 1957-61 amounted to about 97,000 short tons, valued at $5.2 million. In 1967 about 28 percent of the total quantity consumed went into roofing, 23 percent into paint, 18 percent into joint cement, and 6 percent into the manufacture of rubber (table 2). Consumption of dry-ground mica accounted for about 85 percent, based on quantity, of the total consumption of ground mica.

U.S. producers and production

The United States is the world's largest producer of ground mica. In 1966, 23 firms actively operated 19 dry-grinding plants and four wet-grinding plants. Many of these plants obtain the raw material in

conjunction with their own mica-mining operations. Nine of the mica-grinding plants are in North Carolina; two each in California, Georgia, and New Mexico; and the other eight plants are scattered throughout the United States.

In 1962-67, annual sales by producers averaged approximately 112,000 short tons, valued at $6.6 million. During that period production of ground mica showed no definite pattern. Production reached a high in 1965 of about 127,000 short tons, valued at $7.6 million. The following year it dropped to 103,000 short tons, valued at $6.2 million; in 1967 it dropped to a low point for the period, 97,000 short tons, valued at $5.8 million. About 85 or 90 percent of all ground mica sold is dry-ground (table 3).

U.S. exports and imports

In 1962-67, annual U.S. exports reached a high of 7,151 short tons, 1/ valued at $781,000 in 1967. In terms of quantity, exports in 1967 were almost twice as large as those in 1962 (table 1). During 1962-67, annual exports averaged 4,656 short tons. Canada was the primary U.S. export market, accounting for about one-third of the total export value and tonnage in most years. Exports in 1968 increased to 13,507 short tons, valued at $1.4 million.

Imports of ground mica into the United States are negligible compared with domestic production. During 1962-67, imports ranged from a low of 21 short tons in 1967 to a high point for the period of 148 short tons in 1966. During this period Canada, France, and Norway were the principal suppliers of imported ground mica. Imports of ground phlogopite mica come principally from Canada, whereas ground muscovite mica comes from France and Norway. Imports in 1968 principally from France amounted to 114 short tons, valued at $13,000.

1/ Includes a small amount of block, film, splittings, and waste and scrap mica for the years 1965 through 1967.

Table 1.--Mica, ground or pulverized: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production	Imports	Exports	Apparent consumption
	Quantity (short tons)			
1962	113,787	35	3,714	110,108
1963	117,251	31	3,622	113,660
1964	115,970	23	4,134	111,859
1965	126,597	87	1/ 3,902	122,782
1966	103,450	148	1/ 5,405	98,193
1967	97,053	21	1/ 7,151	89,923
1968	2/	114	1/ 13,507	2/
	Value (1,000 dollars)			
1962	6,489	4	432	6,061
1963	6,805	2	413	6,394
1964	6,902	1	478	6,425
1965	7,615	8	1/ 589	7,034
1966	6,247	11	1/ 929	5,329
1967	5,756	3	1/ 781	4,978
1968	2/	13	1/ 1,408	2/

1/ Includes a small amount of block, film and splittings, and waste scrap mica.

2/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Ground or pulverized mica: Consumption of U.S. production, by industries, 1962-67 1/

Industry	1962	1963	1964	1965	1966	1967
	Quantity (short tons)					
Roofing	38,767	38,980	35,119	30,847	26,211	27,161
Wallpaper	783	1,269	1,327	2/	2/	2/
Rubber	7,081	6,979	7,034	7,020	7,356	6,196
Paint	20,801	23,597	20,782	20,286	17,192	22,374
Welding rods	1,447	1,169	944	745	799	525
Joint cement	21,778	24,625	3/	38,767	24,860	17,063
Other uses 4/	23,130	20,632	50,164	28,932	27,032	23,734
Total	113,787	117,251	115,970	126,597	103,450	97,053
	Value (1,000 dollars)					
Roofing	1,199	1,370	1,100	1,057	887	940
Wallpaper	118	188	209	87	2/	2/
Rubber	803	728	865	786	770	676
Paint	1,806	1,890	1,895	1,816	1,558	1,976
Welding rods	78	58	34	32	39	25
Joint cement	1,524	1,603	3/	2,531	1,604	945
Other uses 4/	961	968	2,799	1,306	1,389	1,115
Total	6,489	6,805	6,902	7,615	6,247	5,756

1/ Includes exports of ground mica by U.S. producers.
2/ Not available.
3/ Included with "other uses."
4/ Includes mica used for molded electric insulation, house insulation, Christmas tree snow, and annealing.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Table 3.--Ground or pulverized mica: U.S. production, by method of grinding, 1962-67

Type	1962	1963	1964	1965	1966	1967
	Quantity (short tons)					
Dry-ground	99,936	101,953	99,245	110,600	87,361	82,849
Wet-ground	13,851	15,308	16,725	15,997	16,089	14,204
Total	113,787	117,251	115,970	126,597	103,450	97,053
	Value (1,000 dollars)					
Dry-ground	4,351	4,596	4,397	5,316	4,110	3,842
Wet-ground	2,138	2,209	2,505	2,299	2,137	1,915
Total	6,489	6,805	6,902	7,615	6,247	5,756

Source: Compiled from official statistics of the U.S. Bureau of Mines.

	TSUS item
Built-up mica	516.91
Articles of mica not elsewhere enumerated	516.94

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

During the period 1962-66, U.S. production supplied 98 percent of the average annual consumption of built-up mica (5.4 million pounds) and a like percentage of the estimated annual consumption of articles of mica (2.4 million pounds). U.S. exports of built-up mica and articles of mica combined amounted to about 5 percent of total annual production.

Description and uses

Built-up mica consists of plates, sheets, or tapes made of alternate layers of overlapping, irregularly arranged mica splittings and a bonding material, or of reconstituted mica, whether or not treated with resins. 1/ Reconstituted mica is a sheet material formed from specially delaminated scrap mica by papermaking techniques.

The principal forms of built-up mica covered here are segment plates, molding plates, heater plates, flexible (cold-forming) plates, and sheets and tapes.

Segment plates are hard rigid stock primarily used in commutators as electrical insulation, between the copper commutator segments in all direct current motors, high voltage alternating current motors, and generators. Molding plates, which are designed to soften when subjected to heat, are molded into the desired shape or form for use as commutator rings, tubes, sleeves, and bushings for motors and generators and armature slot cells. Heater plates, which are nonflammable, odorless, and smokeless, are used where high insulation strength at high temperatures is required, such as in hair dryers, heaters, irons, toasters, hot plates, and other heating equipment.

Flexible (cold-forming) plates are used in electric motors and generators for armature end-turn insulation and slot liners, field coil insulation, and magnet and commutator core insulation, as well as in transformer coil insulation, insulating collars, channels, and rings.

1/ See headnote 1(d) to subpart D, part 1, of schedule 5 of the TSUSA-1969.

BUILT-UP MICA AND ARTICLES OF MICA, NOT ELSEWHERE ENUMERATED

Built-up mica sheets and tapes (with or without paper, cloth, or other backing) are used as wrapped insulation for coils and conductors of motors, transformers, and other electrical equipment.

Reconstituted mica, which is used instead of built-up mica in some applications, is used in electrical insulating systems of electrical equipment and as a dielectric material in special capacitors.

Articles of mica considered here are those in chief value of mica, and they consist generally of items for electrical and electronic equipment. These articles may be made from built-up mica--commutator rings and insulating collars which are not chiefly used with particular machines or equipment--or they may be made from sheet mica 1/ to which eyelets, wires, rivets, or other forms have been attached. Not included here are mica articles cut or stamped to dimensions, shape, or form (see separate summary in this volume, items 516.71 -.76) and mica articles that are considered parts of specific electrical machinery and equipment provided for in schedule 6, part 5 of the TSUSA.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
516.91	Built-up mica	17% ad val.	13.5% ad val.	8.5% ad val.
516.94	Articles not specially provided for, of mica. 1/	25% ad val.	20% ad val.	12.5% ad val.

1/ These articles, if Canadian articles and original motor-vehicle equipment, are duty free under item 516.98. See summary on mica, cut or stamped to dimensions, shape, or form.

1/ See the summary, in this volume, on mica, not manufactured, and mica films and splittings (items 516.11, 516.31, -.61) for the definition of the term "sheet mica".

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968. These rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to a reduction of 50 percent on each item, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption, production, and producers

Built-up mica.--During the period 1962-66 apparent U.S. consumption of built-up mica, which is nearly equivalent to production, showed an increase every year in both quantity and value. Consumption ranged from 4.9 million pounds, valued at $15.5 million, in 1962 to 5.7 million pounds, valued at $17.8 million, in 1965 (table 2). Consumption has declined since that year and in 1967 amounted to 5.4 million pounds, valued at $15.0 million. The trend of consumption of built-up mica generally parallels that of production of the electronic and electrical generating industries. The principal forms of built-up mica produced and consumed in 1966, were segment plates (29 percent of the total quantity and 21 percent of the total value), tapes (25 percent of quantity and 32 percent of value), molding plates (20 percent of quantity and 21 percent of value), and flexible plates (15 percent of quantity and 12 percent of value).

In 1966, 12 U.S. companies with 13 plants produced built-up mica; however, the bulk of the output was accounted for by five plants--two each in New York and Pennsylvania and one in New Hampshire. Several firms manufacture built-up mica for their own use.

Articles of mica.--Estimated annual production and consumption of articles of mica, based on the quantity of block and film mica consumed by domestic fabricators plus imports, held at a relatively steady rate during 1962-66, averaging approximately 2.3 million pounds a year (table 2). Estimated production reached a high of 2.5 million pounds in 1962 and 1966, while the low during this period was 1.8 million pounds in 1963. Production in 1967 declined to an estimated 1.7 million pounds.

Approximately 20 companies, including many of the 12 producers of built-up mica, accounted for most of the domestic production of articles of mica. These producers are concentrated near the major mica-consuming areas in the northeastern United States.

BUILT-UP MICA AND ARTICLES OF MICA, NOT ELSEWHERE ENUMERATED

U.S. exports and imports

U.S. exports of built-up mica and articles of mica are not separately reported. Exports, the statistics on which include unknown quantities of worked mica, generally have amounted to less than 5 percent of production. During 1962-66, exports rose from a low of 197,000 pounds in 1962 to a high of 538,000 pounds in 1966 (table 1). They declined in both 1967 and 1968 and amounted to 475,000 pounds in the latter year.

During the period 1962-66, U.S. imports of built-up mica and articles of mica each were equal to less than 3 percent of domestic production of the like articles. In this period imports of built-up mica declined from a high of 142,000 pounds in 1962 to a low of 11,000 pounds in 1965, then increased to 53,000 pounds in 1966 (table 2). They declined to 42,000 pounds in 1967, then increased to 46,000 pounds in 1968. Most of the imports of built-up mica came from Belgium.

During 1962-66, imports of articles of mica, consisting mostly of articles of natural mica, declined from 93,000 pounds in 1962 to a low of 8,000 pounds in 1965. After increasing to 13,000 pounds in 1966, and 15,000 pounds in 1967, they again declined to 8,000 pounds in 1968. The United Kingdom and France have been the principal sources in recent years.

Table 1.--Built-up mica and articles of mica: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production 1/	Imports	Exports 2/	Apparent consumption
	Quantity (1,000 pounds)			
1962	7,324	235	197	7,362
1963	6,857	208	204	6,861
1964	7,614	137	281	7,470
1965	8,084	19	523	7,580
1966	8,080	66	538	7,609
1967	7,036	57	527	6,566
1968	3/	54	475	3/
	Value (1,000 dollars)			
1962	3/	629	765	3/
1963	3/	534	831	3/
1964	3/	269	946	3/
1965	3/	202	1,635	3/
1966	3/	191	1,612	3/
1967	3/	136	1,753	3/
1968	3/	153	1,358	3/

1/ Estimated.
2/ Includes unknown quantities of worked mica.
3/ Not available.

Source: Imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Built-up mica and articles of mica not elsewhere enumerated: U.S. production and imports for consumption, by types, 1962-67

Item	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Built-up mica:						
Production	4,824	5,007	5,264	5,684	5,580	5,336
Imports	142	127	116	11	53	42
Articles of mica:						
Production 1/	2,500	1,850	2,350	2,400	2,500	1,700
Imports	93	81	21	8	13	15
	Value (1,000 dollars)					
Built-up mica:						
Production	15,449	15,613	16,629	17,783	15,731	14,999
Imports	105	100	85	13	87	57
Articles of mica: 2/						
Imports	524	434	184	189	104	79

1/ Estimated on the basis of the quantity of block and film mica consumed by domestic fabricators.
2/ Value of production not reported.

Source: Production compiled from official statistics of the U.S. Bureau of Mines, except as noted; imports compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Artificial graphite	517.11
Electrodes for electric furnaces	517.61
Lighting carbons	517.71, -.74
Carbon brushes and brush stock	517.81, -.82
Carbon or graphite products, not elsewhere enumerated	517.91

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The industry producing carbon and graphite products in the United States is a sizable one with sales of more than $290 million in 1967. The industry has long been on net export basis. The average value of annual U.S. exports of such products in 1962-67--about $19.1 million--was more than twice the average value of imports in the same period.

Description and uses

The commodities included in this summary are artificial graphite and articles composed wholly or made from artificial amorphous carbon, artificial graphite, and natural graphite. A few of these products, however, contain varying amounts of other materials (principally metals)--some to such an extent that the products are essentially in large part of materials other than carbon. Certain refractory carbon and graphite products, including natural graphite crucibles (TSUS item 531.33) are discussed in other summaries as are calcined coke (TSUS item 517.51), natural graphite (TSUS items 517.21, 517.24, 517.27, and 517.31) and carbon black (TSUS item 473.04).

Carbon is especially suitable for use in a variety of products included in the items considered here because of its high resistance to the action of most chemicals, high thermal and electrical conductivity, high resistance to thermal shock, immeltability, high strength-to-weight ratio, and the ease with which it can be formed into a variety of shapes by extrusion, molding, or machining.

Manufactured carbon products are made from various carbonaceous substances, the most important of which are petroleum coke, specially prepared anthracite coal, carbon black, natural graphite, and coal coke. Artificial carbon and graphite articles are made by processing and heat-treating the impure carbonaceous materials into almost pure

amorphous carbon and very pure graphite. The selected raw material is usually calcined, ground, and sized, and then mixed with a coal-tar pitch binder and a small quantity of petroleum-based oil to facilitate extrusion or molding. The materials are then heated to about 150° C., thoroughly mixed, cooled to about 100° C., and extruded or molded into the desired shape. After baking in oil or gas-fired furnaces at about 1,000° C. for about 11 to 13 weeks, the carbon products are removed and cooled preparatory to use or shipment to consumers. Those to be converted to graphite are transferred to graphitizing, resistance types of furnaces and heated at about 2,800° C. to produce a dense mass of soft, unctuous graphite in the desired shape and size. At this stage most of the graphite products are ready for use, but some may undergo further machining or manufacturing operations.

Artificial graphite.--Artificial graphite powder is produced by heating petroleum coke to about 2,800° C. in an electric resistance furnace or as a byproduct in the manufacture of artificial graphite articles. In the latter operation, powdered or granular coke is used to cover the extruded or molded carbon articles in order to form a homogeneous charge of equal resistivity in the electric furnace. When the articles are graphitized, the covering material is also graphitized. The covering material may be reused or marketed. Artificial graphite powder is used in lubricants, brake linings, clutch facings, foundry facings, and many other diverse applications.

Electrodes for electric furnaces.--Furnace and electrolytic electrodes are terminals of an electrical source used to produce the heats needed in the production of certain metals, metal products, chemicals, and chemical compounds. Both types are made of carbon or graphite and may be square, cylindrical, or rectangular in shape. The principal materials used to manufacture electrodes are petroleum coke and anthracite coal.

Graphite electrodes are preferred in electrolytic cells producing chemicals and chemical compounds, and in some of the larger electric furnaces making steel and special alloy ingots. Carbon electrodes are commonly used to produce calcium carbide, abrasives, ferroalloys, and phosphorus, and in the electrolytic production of primary aluminum. Both types are used in electric furnaces producing iron and steel.

Lighting carbons.--Electric arc carbons and electrodes are used to produce radiations of very brilliant, visible light and the closely allied, invisible ultraviolet and infrared forms of radiant energy. Carbon arc radiation, visible and invisible, is produced by separating carbon rods (electrodes) and passing high voltage electricity through them to create a continuous spark of great brilliance at the gap between their tips. The carbons are made from petroleum coke and specially prepared carbon black.

The present trend in the utilization of the carbon arc is toward specialized fields rather than the field of general illumination. Industrial and commercial applications of the carbon arc include photography, blueprinting, photoengraving and photolithography, motion-picture projection, searchlights and floodlights, light therapy, and spectroscopic analysis. The carbon arc is also used to reproduce natural sunlight for accelerated testing of materials, plant growth control, milk irradiation, and color motion-picture production.

Brushes and brush stock.--Brushes are sliding electrical contacts that collect electric current from the revolving commutators of motors and generators. Many standardized brush shapes and sizes are regularly manufactured, but there are also thousands of types, not regularly stocked, that are made to order from brush stock such as plates or rods of carbon or graphite.

Brushes are usually made of natural amorphous lump graphite, artificial graphite, and artificial amorphous carbon, either wholly or of admixtures of these materials. They may also contain varying quantities of copper, silver, lead, and tin--the copper to facilitate the flow of electricity and the other metals to reduce commutator wear. The copper and silver content may run as high as 95 percent so that the brush is essentially metallic in appearance, but other brush grades containing lesser quantities of metals are graphitic in appearance.

Carbon brushes are most indispensable in: power generation, transportation, military equipment, and consumer appliances.

Other carbon and graphite products.--Carbon and graphite products have wide industrial applications, particularly in the metallurgical, chemical, and electrical fields. Either amorphous carbon or artificial graphite is used, depending on which is best suited for the particular use.

Metallurgical applications include carbon linings for ferroalloy furnaces, ingot mold plugs, molds, sintering boats, liners, fluxing tubes, and many others. Pipes, fittings, valves, pumps, heat exchangers, and special shapes for handling and processing corrosive materials, to mention a few non-enumerated articles of carbon, find extensive use in the chemical industry.

Special-property carbon and graphite products have recently been developed using complex, though secret, manufacturing processes. Foremost among these are oriented graphite, recrystallized bulk graphite, and the so-called vitreous carbons, all of which are stronger, harder, and denser than ordinary graphite, in addition to having special individual properties. Oriented graphites and recrystallized bulk graphite are used in the missile industry as rocket motor nozzles and nose cones. Both of these materials may join artificial graphite

products for use in the field of atomic energy. Vitreous carbons may have space applications as well as high temperature uses.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
517.11	Graphite, crude and refined; artificial.	5% ad val.	4% ad val.	2.5% ad val.
	Carbons and electrodes:			
517.61	Electrodes, in part of carbon or graphite, for electric furnace or electrolytic purposes. 1/	12.5% ad val.	10% ad val.	6% ad val.
	Carbons and electrodes, for producing electric arc light:			
517.71	Under 0.5 inch in diameter or of equivalent cross-sectional area.	14% ad val.	11% ad val.	7% ad val.
517.74	0.5 inch or more in diameter or of equivalent cross-sectional area.	12% ad val.	9.5% ad val.	6% ad val.
517.81	Brushes for electric generators, motors, or other electrical machines or appliances; plates, rods, powder, and other forms, wholly or partly manufactured, for manufacturing into the aforesaid brushes.	10% ad val.	8% ad val.	5% ad val.

See footnote at end of tabulation.

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Brushes for electric generators, motors, etc.--Con.			
517.82	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).	Free	2/	
517.91	Articles not specially provided for, of carbon or graphite.	15% ad val.	12% ad val.	7.5% ad val.

1/ Duty temporarily suspended from October 8, 1965 for electrodes used in producing aluminum; the suspension of duty, unless extended by legislation, terminates on July 15, 1969.

2/ Duty-free status not affected by trade conference.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). Item 517.82 became effective as to articles entered on or after January 18, 1965 under the provisions of the Automotive Products Trade Act of 1965. This item was not negotiated in the Kennedy Round of trade negotiations.

U.S. consumption

U.S. consumption of carbon and graphite products is related to industrial production and should continue to rise as industrial activity expands.

Consumption of these commodities was valued at nearly $281 million in 1966 (table 1). This figure represents only the portion of

the carbon and graphite products that entered trade channels and does not include the value of the huge quantities of electrodes produced and consumed by producers of primary aluminum metal. Estimated annual U.S. consumption of electrodes by the aluminum industry in the period 1962-66 increased from 1.2 million to nearly 1.7 million tons, with a value of $60 million to $85 million.

In 1963, the latest year detailed trade statistics are available, consumption of electrodes for furnace and electrolytic purposes accounted for about 49 percent of total consumption; brushes and brush stock, for about 19 percent; and carbon and graphite articles (including lighting carbons), for the remaining 32 percent.

Annual consumption of crude artificial graphite is estimated to range between 5,000 and 10,000 tons, valued at $1 million to $2 million.

U.S. producers

In 1966 about 35 U.S. companies produced carbon and graphite products at 54 plants. Half of the primary producing plants were situated in the northeast part of the United States, the other half, in the north central, southwest, and western sections of the United States.

Companies that manufacture carbon and graphite products vary in size and in variety of products. Of the 19 large firms producing a relatively full line of carbon and graphite products, several produced aluminum and also manufactured huge quantities of furnace electrodes for their own use. These large firms accounted for about 80 to 90 percent of brush and other carbon and graphite manufactures. Nine firms produced lighting carbons, however, one of them dominated domestic production.

U.S. production (shipments)

U.S. production of carbon and graphite products, as measured by value of shipments, was almost $218 million in 1963. Of that amount, electrodes for electric furnaces and electrolytic purposes accounted for approximately $104 million. This did not include the value of the very large output of electrodes produced by aluminum companies for internal consumption. Brushes for electrical machines and apparatus accounted for about $39 million, and other carbon and graphite manufactures including lighting carbons for $75 million. The value of lighting carbons produced annually in recent years probably amounted to about $20 million.

U.S. exports

For many years, the United States has been on a net export basis for carbon and graphite products. During 1962-67, the value of annual U.S. exports of these commodities ranged from $16.6 million to $21.9 (table 1) and averaged $19.1 million. Exports were shipped principally to Canada, Mexico, and Central and South America. In 1968, exports amounted to $23.9 million.

There were probably no exports of crude artificial graphite during 1962-68.

U.S. imports

During 1962-67, the value of U.S. imports of carbon and graphite products ranged from $5.8 million in 1962 and 1963 to $13.2 million in 1967 (table 2), and averaged $8.4 million. In 1968, imports of carbon and graphite products amounted to $10.8 million.

During 1962-67 the increase in the value of imports of carbon electrodes for electric furnaces offset the substantial declines in the value of imports of lighting carbons and other articles of carbon or graphite products. The value of imports of brushes more than doubled during this period (table 2).

Japan, the United Kingdom, France, West Germany, and Canada supplied most of the carbon and graphite products, but significant quantities were contributed by Belgium (lighting carbons) and Mexico (miscellaneous products). Imports from France, traditionally the major foreign source of the products, were exceeded in total value beginning in 1964 by imports from Japan, most of which consisted of furnace and electrolytic electrodes.

In 1967, Japan, the Netherlands, the United Kingdom, and France supplied most of the electrodes for electric furnace or electrolytic purposes (table 3). Carbon and graphite products came mainly from West Germany, Japan, and the United Kingdom. France and West Germany supplied the bulk of the lighting carbons, while the United Kingdom and Canada were the principal sources of brushes and brush stock. West Germany accounted for about half of the value of the artificial graphite imported during 1967.

Table 1.--Carbon or graphite products other than natural graphite: U.S. shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

(Value in thousands of dollars)

Year	Shipments	Imports	Exports	Apparent consumption
1962	193,400	5,840	16,600	182,640
1963	217,817	5,828	17,685	205,960
1964	245,228	7,182	18,646	233,764
1965	277,100	9,270	19,465	266,905
1966	293,600	9,001	21,910	280,691
1967	1/	13,194	20,338	1/
1968	1/	10,800	23,875	1/

1/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Carbon and graphite products: U.S. imports for consumption, by item, 1962-68

(In thousands of dollars)

Item	1962	1963	1964	1965	1966	1967	1968
Artificial graphite	95	13	4	11	12	37	39
Electrodes for electric furnaces 1/	770	2,721	5,495	6,932	5,975	10,448	7,642
Lighting carbons	1,794	901	710	873	574	624	751
Brushes and brush stock	497	532	570	701	1,247	1,269	1,438
Articles of carbon or graphite, not elsewhere enumerated	2,684	1,661	443	753	1,193	816	930
Total	5,840	5,828	7,183	9,270	9,001	13,194	10,800

1/ Since October, 1965 the duty on electrodes for the production of aluminum was suspended.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--U.S. imports of carbon and graphite products, by kinds and principal sources, 1967

(In thousands of dollars)

Item	Canada	West Germany	France	Italy
Crude artificial graphite	9	19	-	-
Electrodes for electric furnaces	20	11	287	2
Lighting carbons	-	108	308	62
Brushes and brush stock	346	182	233	3
Other articles of carbon or graphite	36	257	65	-
Total	411	577	897	67

Item	Japan	United kingdom	All other	Total all countries
Crude artificial graphite	-	4	5	37
Electrodes for electric furnaces	4,922	359	1/ 4,847	10,448
Lighting carbons	82	11	53	624
Brushes and brush stock	54	407	44	1,269
Other articles of carbon or graphite	251	152	55	816
Total	5,309	933	1/ 5,004	13,194

1/ Includes imports valued at $4,473 thousand from the Netherlands.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Natural graphite:	
Crystalline flake	517.21, -.24
Crystalline lump or chip	517.27
Other	517.31

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. consumption of natural graphite is supplied almost entirely from imports.

Description and uses

Graphite, sometimes called plumbago, is a soft, black, unctuous (greasy) form of carbon which is found naturally as a mineral, or is produced artificially. Artificial graphite is provided for in TSUS item 517.11 and is covered in the summary on manufactured carbon and graphite products. Graphite owes its commercial importance to such inherent qualities as refractoriness (ability to withstand high temperatures), high thermal and electrical conductivity, inertness to a wide range of reagents, opacity, unctuousness, and miscibility.

Deposits of natural graphite are widely distributed throughout the world, but many of them are unsuited for commercial operation. Lump graphite is mined from vein deposits; amorphous, from metamorphosed coal beds; and crystalline flake, from layered metamorphosed rocks. A wide variety of milling methods are used for beneficiating graphite ores, depending on the nature of the deposits. Some ores require only hand-sorting, but others must be subjected to such operations as crushing, washing, screening, flotation, and air separation.

Natural graphite is divided into two commercial classes--crystalline and amorphous. Both may include lump, chip, and dust graphite, but only the crystalline class contains flake. Crystalline graphite is commonly understood by the trade to be graphite in crystals large enough to be seen with the unaided eye. "Amorphous graphite" is a term used by the trade for designating very fine-grained, earthy-looking graphite, even though it is usually composed of minute crystals. Thus the trade distinction between crystalline and amorphous graphite (except Ceylon lump graphite) is based chiefly on the difference in the size of the graphite particles. Crystalline graphite is graded according to carbon content and particle size, while amorphous graphite, except that from Ceylon, is graded according to carbon content.

Lump graphite from Ceylon (the most important world source of high-grade lump graphite) that can be easily reduced to fine particles by grinding, is classed as amorphous, while the tough Ceylonese lump that can be reduced to fine particles only with great difficulty is classed as crystalline lump.

There are many commercial grades of graphite, but most of them can be described only in general terms because of the lack of standard specifications. Because imports supply most of the U.S. requirements of natural graphite, emphasis in this summary is given to the properties and utilization of the kinds imported. Graphite imported from one country is generally blended with graphite from other countries, and the specifications of the blended products are closely guarded trade secrets. To the consumer, satisfactory performance in actual use is generally the main criterion of suitability.

Flake graphite imported from the Malagasy Republic, the principal world source of high-grade flake, is marketed as "flake" (coarse flake) and "fines" (fine flake) of a specific carbon content. Crucible-grade flake, ranging in size from 8- to 60-mesh and containing at least 86 percent graphitic carbon, is noted for the size and toughness of the individual flakes.

Lump graphite from Ceylon is classed by grades, depending on particle size and graphitic carbon content, as follows:

Grade designation	Particle size	Graphitic carbon content (percent)
Lump	Walnut to pea	90-98
Chip	Pea to wheat grain	85-90
Dust	40- to 60-mesh	55-85
Flying dust	Finer than 60-mesh	55-90

Lump and chip grades are further classed according to degree of consolidation.

Amorphous graphite from Mexico is classed as high or low grade, depending on graphitic carbon content. High-grade Mexican graphite contains about 85 percent graphitic carbon and, although the low-grade graphite can be anywhere below this figure, little is shipped to the United States that contains less than 80 percent graphitic carbon.

The various grades of graphite are marketed by producers, importers, and distributors. Domestic producers sell directly to consumers, while foreign suppliers sell almost wholly to importers, which in turn may sell the graphite as imported or grind and blend it to meet consumer requirements. The marketed product is usually a loose material of a specific carbon content and particular size, although the graphite may be manufactured into finished shapes by some importers.

January 1969
5:1

Certain grades of graphite deemed essential in wartime have been designated strategic by the United States. The major strategic use for Ceylon amorphous lump graphite is in brushes for fractional horsepower motors and other electrical equipment used in high-altitude military aircraft and submarines, and for similar low-voltage applications. The major strategic application of Malagasy flake graphite is in clay-graphite crucibles. The inventory as of December 31, 1967, of stock pile grade graphite showed that all categories were at or above stock pile objectives.

Amorphous graphite is used largely in foundry facings (about 40 percent), steelmaking (about 20 percent), lubricants (about 13 percent), and refractories (about 13 percent). Flake graphite is used principally in crucibles, foundry facings, lubricants, and pencils.

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Graphite, crude and refined:			
	Natural:			
	Crystalline flake (not including flake dust):			
517.21	Valued not over 5.5 cents per pound.	15% ad val.	12% ad val.	7.5% ad val.
517.24	Valued over 5.5 cents per pound.	0.825¢ per pound	0.65¢ per pound	0.4¢ per pound
517.27	Crystalline lump or chip.	5.5% ad val.	4% ad val.	2.5% ad val.
517.31	Other	0.5% ad val.1/	Free	Free

1/ Applicable to that valued at more than $50 per ton.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates, except for item 517.31, had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The ad valorem equivalent of the rate for TSUS item 517.24, based on 1968 imports, was 7.7 percent. The duty on natural graphite, crude and refined, as provided for in original TSUS item 517.31, if valued at $50 per ton or less, was temporarily suspended through June 30, 1966 under item 909.20. In accordance with Public Law 89-433 of May 31, 1966, item 909.20 was deleted effective on July 1, 1966. At the same time, item 517.31 was repealed and two new items, 517.30 and 517.33, were established, effective as of July 1, 1966--item 517.30 providing for graphite free of duty if valued at $50 or less per ton, with item 517.33 providing for graphite valued over that amount. Effective January 1, 1968, as a result of the Kennedy Round negotiations, items 517.30 and 517.33 were deleted and new item 517.31 was established providing for a duty free status for that graphite previously provided for by both items 517.30 and 517.33.

U.S. consumption

U.S. consumption of natural graphite in 1966 was 48,365 tons, valued at $6.6 million, compared with 44,385 tons, valued at $5.6 million, in 1962. During 1962-66, annual consumption averaged 48,180 tons, valued at $6.4 million. Of this tonnage, 7 percent consisted of amorphous lump (all from Ceylon); 19 percent, crystalline flake; and 74 percent, "other" amorphous, imported principally from Mexico. In terms of value, however, "other" amorphous accounted for only 55 percent, while crystalline flake and Ceylon amorphous lump accounted for 31 and 14 percent, respectively.

The current consumption pattern of natural graphite indicates little change in the foreseeable future. Use in lubricants and foundry facings appears to be declining, while batteries, steelmaking, and other uses are remaining stable or rising slightly.

Although there is no satisfactory substitute for graphite in most of its applications, some replacement has occurred. Silicon carbide-graphite crucibles have been substituted for clay-graphite crucibles, reducing the need for coarse flake. Molybdenum disulfide has, to a certain extent, replaced natural graphite as a lubricant.

U.S. producers and production

The one producer of natural graphite in the United States in 1966 marketed about 20 grades of flake graphite from an open pit mine located near Burnet, Texas. The company is considered to be vertically integrated with respect to its natural graphite operations since it owns, mines, and processes the raw material and markets the finished products. The firm also imports and blends graphite for its own utilization or for resale to consumers. Products sold, in addition to blends of natural graphite, include antiflux bearings, clay-graphite crucibles, lubricants, electroplating facings, and pencils.

U.S. graphite producers encounter strong competition from foreign sources because imported graphite is lower in price and is usually of better quality. U.S. graphite is acceptable, however, sometimes even at the higher price, but consumers refuse to change established formulas requiring foreign graphite, because there is no assured supply of domestic graphite with the qualitites required. Foreign reserves of high-grade material are large and assured, but the current trend is toward deeper underground mining with its consequent higher cost. The higher extraction cost will probably be offset by greater mine mechanization, so that the competitive position of foreign graphite with respect to U.S. graphite will probably remain the same.

U.S. exports

Annual U.S. exports of natural graphite averaged about 2,300 short tons during 1962-67, and consisted principally of amorphous graphite from Mexico that had been reprocessed.

U.S. imports

Imports increased from 35,000 short tons in 1962 to 57,000 short tons in 1966, but were higher in 1965 than in 1964 (table 1). In 1968 imports amounted to 68,000 short tons having a value of $2.4 million.

Natural graphite was imported, processed and distributed by five domestic companies in 1964. Some of these companies owned and operated almost all of the amorphous graphite deposits in Mexico. In 1962-66, amorphous graphite usually accounted for about 85 percent of all imports of natural graphite, flake graphite for slightly more than 11 percent, and Ceylon amorphous and crystalline lump for 2 to 4 percent.

The United States is dependent on foreign countries for nearly all of its natural graphite requirements. Mexico supplies most of the low-grade amorphous; the Malagasy Republic, most of the flake; and Ceylon, most of the high-grade lump graphite. West Germany and Norway also supply moderate tonnages of amorphous graphite.

Table 1.--Graphite, crude and refined: U.S. consumption, imports for consumption, and exports of domestic and foreign merchandise, 1962-68

Year	Consumption 1/	Imports	Exports 2/
	Quantity (1,000 short tons)		
1962	44	35	1
1963	47	52	1
1964	54	47	2
1965	47	58	3
1966	48	57	3
1967	38	56	4
1968	3/	68	4
	Value (1,000 dollars)		
1962	5,648	1,688	223
1963	6,111	1,987	190
1964	7,026	1,939	333
1965	6,390	2,376	419
1966	6,629	2,533	428
1967	5,743	2,311	460
1968	3/	2,458	509

1/ Includes small quantities of artificial graphite.
2/ Principally amorphous graphite imported from Mexico and processed in the United States.
3/ Not available.

Source: Consumption, compiled from official statistics of the U.S. Bureau of Mines; imports and exports, compiled from official statistics of the U.S. Department of Commerce.

Note.--Statistics on U.S. production of natural graphite are not available, but production is known to be small.

Table 2.--Natural graphite: U.S. imports for consumption, by principal sources, 1962-68

Year	Mexico	Malagasy Republic	Ceylon	All other	Total
	Quantity (1,000 short tons)				
1962	23	5	3	4	35
1963	40	5	2	5	52
1964	34	4	3	6	47
1965	41	6	3	8	58
1966	40	6	4	7	57
1967	43	5	4	4	56
1968	55	4	2	7	68
	Value (1,000 dollars)				
1962	432	471	328	457	1,688
1963	766	468	279	474	1,987
1964	653	416	364	506	1,939
1965	816	539	279	742	2,376
1966	847	601	474	611	2,533
1967	893	570	442	436	2,311
1968	1,035	429	260	734	2,458

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Calcined petroleum and coal coke not suitable for fuel	517.51

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States is believed to be the largest producer and consumer of calcined petroleum and coal coke. During the period 1962-66, estimated annual exports averaged a million short tons, while imports were virtually nil.

Description and uses

Calcined petroleum and coal cokes are cokes that have been heat-treated (calcined) in rotary, shaft, and electric kilns to drive off volatile impurities and to shrink the coke so that volume changes in subsequent heat treatment will be small and controllable. Calcined cokes are specifically produced for nonfuel uses. Petroleum coke and coal coke suitable for use as a fuel are included in the summary on item 521.31--"Coal Coke and Compositions Thereof."

Calcining is done principally in rotary kilns. Calcination at high temperatures in an atmosphere of limited oxygen results in an almost pure material--low in volatile fractions and low in ash or insoluble residue--that contains about 95 percent fixed carbon. The calcined coke may be further treated to improve its chemical composition and physical characteristics. The quality of calcined coke depends largely on its density and impurity content.

Nearly all calcined coke is obtained from delayed petroleum coke, a carbon residue from the cracking of petroleum refinery residuums. Calcined petroleum coke is also obtained from gilsonite, a natural bitumen, while calcined coal coke is produced from cellular residue of the distillation of volatiles from certain varieties of bituminous coal.

Coke calciners process and blend selected cokes to yield a calcined coke of uniform quality that is suitable for use in the manufacture of certain carbon compounds and carbon and graphite products. The carbon compounds include carbon disulfide and the carbides of calcium, boron, and silicon.

Carbon and graphite products made from calcined coke fall into four main groups: (1) Electrodes; (2) brushes and brush parts for electrical equipment; (3) specialties such as valves, impervious pipe, and heat exchangers; and (4) electronic, missile, and jet propulsion parts. Carbon and graphite products are covered in another summary in this volume.

Calcined coke encounters little direct competition from other materials as a source of carbon in the manufacture of carbon products. Specially prepared anthracite is virtually the only carbon material that successfully competes with calcined coke.

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
517.51	Calcined petroleum and coal coke, not commercially suitable for use as fuel.	15% ad val.	12% ad val.	7.5% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, which had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969 reproduced in appendix A for the staged rates).

U.S. consumption

It is estimated that the average annual U.S. consumption of calcined coke for the period 1962-66 exceeded 2 million short tons, valued at about $50 million. Consumption is believed rising (at an

unknown rate), principally because of availability, and increasing knowledge of calcined coke and its applications.

An estimated one-half of the calcined coke is utilized by primary aluminum companies for captive electrode manufacture, while the rest is consumed by the carbon products industry, the chemical industry, and others.

U.S. producers

Prior to 1957, calcined coke was produced exclusively by firms in the carbon products industry, but calcined coke is now produced by companies of the carbon products industry, the primary aluminum industry, and the petroleum industry. The three types of companies all calcine petroleum coke, and one carbon products firm also calcines coal coke. Some of the companies that manufacture products composed of carbon or graphite are owned either partly or wholly by petroleum and coal companies.

At the end of 1963, nine of the 18 coke calcining plants in the United States were owned by five carbon products companies; four, by two producers of primary aluminum; and five, by three petroleum companies. Five of the plants were situated on the west coast, four on the gulf coast, four in the Midwest, three in West Virginia, and one each in New York and Colorado. Most calcining plants are adjacent to petroleum refineries, but some are strategically located to take advantage of a variety of cokes from a number of refineries.

Carbon products companies calcine coke for their own use, for consumers on a custom basis, and for sale in domestic and foreign markets. Such companies account for about 90 percent of the calcined coke produced. Coke calcined by aluminum companies is all captive production, while that calcined by petroleum companies is sold in the open market or used by subsidiary companies manufacturing carbon products.

U.S. production

An estimated 50 percent of the marketable petroleum coke produced by the U.S. petroleum industry is calcined. U.S. production of calcined coke has steadily risen from slightly more than 1.6 million tons in 1962 to about 3.8 million tons in 1966.

Most calcined coke is produced as an intermediate product in the manufacture of carbon products, or it is produced on a custom basis for aluminum companies and is not sold in the open market.

The percentage of U.S. production that is captive is unknown. At the present time, producers of primary aluminum purchase most of their needs, but some of the companies have recently erected their own calciners. The continued erection of calciners by aluminum producers is dependent on their obtaining adequate supplies of quality petroleum coke, most of which is already committed on a long-term basis to established calcining companies or is sent to other markets. If sufficient marketable coke becomes available, most of the calcined coke production will be captive since much of it, apart from that consumed by the aluminum industry, is produced and consumed by manufactures of carbon products.

U.S. exports and imports

It is estimated that during the period 1962-66 an average of about 900,000 tons of calcined coke valued at about $25 million, was exported each year. Most of this coke is used to manufacture carbon and graphite products. Japan, the country that imported the largest quantity of calcined coke from the United States, accounted for about 50 percent of the total exported in recent years.

There are virtually no U.S. imports of calcined coke. During the period 1964-67 approximately 2,000 tons was imported each year, mainly from Canada; in 1968, however, imports amounted to 4,639 tons.

Foreign production and trade

The carbon and graphite products industry in foreign countries depends on calcined coke, but the volume of trade in calcined coke is unknown. Foreign companies that have no local sources of coke nor large enough markets to justify erecting calciners, import calcined coke from the United States. Those companies that do have calcining plants may utilize imported petroleum coke, locally generated coke, or both, as feed material.

Despite some differences in equipment and production materials used, U.S. and foreign producers of calcined coke are similar in operations. Foreign calciners use shaft kilns, while U.S. producers use rotary kilns, but, based on economics and product quality, the two methods are about equal. Foreign calciners probably use more coal coke than do their U.S. counterparts. It is doubtful if many foreign refineries produce petroleum coke for use in the carbon products industry.

	TSUS item
Carbon or graphite crucibles----------	531.33

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The value of annual U.S. production of carbon and graphite crucibles is estimated to be between $3 million and $4 million. Imports are small and exports are believed to be about 20 percent of annual production.

Description and uses

This summary covers crucibles composed principally of carbon and graphite; crucibles manufactured from other materials are included elsewhere (see summary on item 531.35 in Schedule 5, Volume 3).

Carbon and graphite crucibles are refractory containers used to melt and hold metals for casting into various solid forms. These crucibles are manufactured--largely of graphite imported from the Malagasy Republic--in many different sizes but in only a few basic shapes.

The two main types of such crucibles are the clay-graphite crucible and the silicon carbide-graphite crucible. Approximately 75 percent of all carbon and graphite crucibles are of the latter type. A few special-use crucibles are machined from manufactured graphite.

Carbon and graphite crucibles are used by nonferrous foundries in casting precious metals, brass, bronze, copper, and aluminum.

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
531.33	Carbon or graphite crucibles.	15% ad val.	12% ad val.	7.5% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, which remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from a concession granted by the United States in the Kennedy Round of trade negotiations, concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption, production, and producers

No statistical data are available on U.S. production and consumption of carbon or graphite crucibles. The value of annual U.S. consumption is estimated to be between $3 million and $4 million.

Crucibles are sold to approximately 3,500 small foundries throughout the United States. Though the industry producing them is small, its significance to industrial activity is great. Because of this importance, crucible-grade natural flake graphite, a principal ingredient in crucibles, has been stockpiled by the Federal Government (see summary on natural graphite, items 517.21 to 517.31 in this volume).

U.S. consumption has decreased because of product improvement (resulting in longer crucible life), substitution of other high-temperature refractory materials, and improved technology in the melting and alloying of metals. In addition, foundries tend to switch to other melting methods rather than use more crucibles when business expands. U.S. producers of carbon and graphite crucibles are believed to be operating at about 35 percent of capacity.

The eight producers of carbon and graphite crucibles in the United States manufacture a complete range of carbon and graphite refractories. None of the firms are large; total employment is approximately 400. Four of the companies are situated in Pennsylvania, and one each in New Jersey, New York, Connecticut, and Massachusetts.

U.S. exports and imports

Statistical data on foreign trade in carbon or graphite crucibles are limited. The value of annual U.S. imports during the 5 years 1964-68 averaged about $29,000. Annual U.S. exports during 1962-66 had an estimated value of about $700,000. Carbon and graphite crucibles are exported principally to Canada and Mexico; imports come from the United Kingdom, Canada, and Japan.

Commodity	TSUS item
Asbestos, not manufactured	518.11

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States is the largest asbestos-consuming country in the world, but it produces only a minor portion of its requirements. In 1962-66, U.S. imports supplied more than 90 percent of apparent domestic consumption. U.S. exports of unmanufactured asbestos are small in comparison with imports.

Description and uses

Asbestos is a general term applied to a number of nonmetallic fibrous minerals which differ in chemical composition and in some physical characteristics. The most important commercial varieties of asbestos--in the order of their importance--are chrysotile, crocidolite, and amosite. Anthophyllite and tremolite asbestos are of limited commercial importance.

Chrysotile, the fibrous variety of the mineral serpentine, is a silicate of magnesium. Deposits of chrysotile are more widespread and abundant than those of crocidolite and amosite, and its fibers are more amenable to spinning. The great bulk of the world's commercial production of asbestos--in recent years about 95 percent--consists of chrysotile.

Crocidolite is a sodium-iron silicate variety of asbestos. Its fibers have a higher tensile strength than those of chrysotile, but are less resistant to high temperatures. Amosite is an iron-magnesium silicate which is closely related to crocidolite. Amosite fibers are flexible and relatively long, but they are harder and harsher and usually have less tensile strength than those of chrysotile, and are less resistant to high temperatures. Each of the principal commercial varieties of asbestos may readily be broken up into fine fibers.

The commercial value of asbestos is due to its fibrous structure which can easily be separated into fine filaments possessing high tensile strength and flexibility, low density, good absorption, high electrical resistivity, and resistance to heat and acids. Most important, however, asbestos, unlike vegetable fibers, consists of chemically inert, incombustible mineral matter.

Commercial asbestos is divided into: (1) asbestos crudes, (2) milled asbestos fibers, and (3) asbestos sand and refuse. "Crudes" is a trade term applied to fibers of spinning grade, measuring three-eighths of an inch or longer, that are hand cobbed (cleaned of waste material with a hammer) without being passed through a mill for fiberizing. Milled asbestos fibers consist of all groups of fibers produced by mechanical treatment of crude asbestos. On the basis of use, milled fibers fall into two principal classes: spinning and non-spinning fiber. Asbestos sand and refuse as provided for in the TSUS item covered here consist of the dust and discards from the milling which does not contain more than 15 percent by weight of foreign matter.

Unmanufactured asbestos is marketed by groups rather than as a single product. Groups of asbestos are principally governed by the length of the fiber. Each length has different characteristics and thus has different applications. Longer fibers command higher prices, and prices are progressively lower for shorter grades, although openness, tensile strength, absorption, and other qualities of the fibers are also taken into consideration.

There is no standard uniform group classification of asbestos in commerce, and the various producing companies and countries adopt their own groupings. The specifications of the Quebec Asbestos Mining Association, whose grades are determined by mechanical sieving (using the Quebec Testing Machine), are widely accepted in the United States. According to the Quebec Asbestos Mining Association, the crudes and spinning fibers comprise group 1, 2, and 3. Group 4 is designated as shingle fiber; group 5, paper fiber; group 6, waste, stucco or plaster; and group 7, refuse or shorts.

Asbestos is currently being used in more than 20 major industry classifications, and there are at present more than 3,000 industrial applications, ranging from textiles to rockets.

Some of the principal uses of asbestos are in woven and molded friction materials, asbestos-cement products, fire-insulating materials, protective coverings, vinyl and asphalt floor tiles, clutch facings, brake band linings, safety clothing, roofing shingles, flat and corrugated siding, boiler and roofing cement, asphalt paving mixes, acid-resistant packings and gaskets, gas mask filters, chemical-resistant filters, cigarette filters, and fireproof drop curtains in theaters. Asbestos is also used as a filtration agent for wines, fruit juices, blood plasma, and a large variety of liquids because of its good absorption qualities. A potential growth market for asbestos is in asphalt paving mixes. Fiber glass competes with asbestos, mainly in the field of heat insulation. Although asbestos can be produced synthetically, commercial production of synthetic asbestos appears to be at least some years away.

January 1969
5:1

U.S. tariff treatment

Imports of asbestos, not manufactured, are duty free, as provided for under paragraph 1616 of the original Tariff Act of 1930. The duty-free status was bound under the General Agreement on Tariffs and Trade, effective January 1, 1948.

U.S. consumption

Annual apparent U.S. consumption of unmanufactured asbestos showed no particular trend during 1962-66, ranging from 720,000 short tons in 1967 to 813,000 short tons in 1964 (table 1). Average annual apparent U.S. consumption for the 5-year period 1963-67 was 771,000 short tons, 10 percent above the average for the preceding 5-year period. The great bulk of this consumption was of the chrysotile variety.

Domestic consumption is centered largely in the northeastern section of the country, but California and southern Louisiana have recently become important consuming areas.

The increased overall consumption in 1963-67 is primarily attributed to the growing number of industrial uses and applications for asbestos. The availability of improved fiber grades in recent years, together with improvement in product design, has permitted many manufacturers to minimize the amounts of asbestos required in their products.

Certain grades and qualities of asbestos have been stockpiled by the U.S. Government as a strategic and critical material. The national stockpile items are spinning-grade chrysotile and amosite. As of January 1, 1968, the national stockpile of chrysotile asbestos amounted to about 10,456 short tons of stockpile grade and 5,228 short tons of nonstockpile grade; that of amosite, to 65,805 short tons; and that of crocidolite, to 15,684 short tons. Government inventories of asbestos are in excess of stockpile objectives as determined by the Office of Emergency Preparedness. The Congress has authorized the General Services Administration to sell the surplus stockpile of asbestos.

U.S. producers and production

Although asbestos occurs in many parts of the United States, deposits suitable for commercial exploitation are limited. In 1967 there were nine producers mining asbestos. One producer, situated in Vermont, had long accounted for the major share of U.S. production until 1964, when California, with four producers, superseded Vermont as the leading producing State. Arizona, with three producers, and North Carolina, with one, accounted for the rest. Some of these producers also manufactured articles of asbestos.

During 1963-67, U.S. production of asbestos increased from about 66,000 short tons in 1963 to 123,000 short tons in 1967. The value of U.S. production increased steadily from $5.1 million in 1963 to $11.1 million in 1966 and 1967 (table 1). The annual average for 1963-67 was 107,000 short tons, valued at $9.1 million, about double the average for the preceding 5-year period, which was 48,000 short tons, valued at $4.6 million. The sharp increase in production reflects the growth of the industry in California.

Nearly all of the U.S. production of asbestos consists of the chrysotile variety. Fibers from the Vermont mine are of moderately short length. Those from California are generally short and suitable only for asbestos-cement products. The asbestos deposits of Arizona are characterized by their pure white color, low iron content, and length of fiber. The Arizona fiber is highly suitable for use in electrical insulation applications because of its low iron content, but it is expensive to mine. Small amounts of anthophyllite asbestos are presently being mined in North Carolina.

In connection with the possible development of suitable domestic deposits, the U.S. Government grants loans, through the Office of Minerals Exploration, of up to 50 percent of approved costs for such developments.

U.S. exports

U.S. exports increased every year during 1963-67, in both quantity and value. In this period, exports increased from 10,000 short tons, valued at $1.3 million, in 1963 to 48,000 short tons, valued at $6.0 million, in 1967 (table 1). In 1968 exports declined to 41,000 short tons, valued at $4.7 million.

The annual average value for the 5-year period 1963-67 was $4.3 million, up from $660,000 for the preceding 5-year period.

In 1967 India was the most important export market, receiving shipments of more than 2.2 million dollars' worth of asbestos, all of nonspinning quality. Approximately one-third of the exports to India in 1967 consisted of U.S. foreign aid shipments.

U.S. imports

In 1963-67, annual U.S. imports of unmanufactured asbestos averaged 700,000 short tons, valued at $69 million (table 1). In the preceding 5-year period imports had averaged 664,000 short tons, valued at $62 million.

In general, imports of asbestos followed the trend of activity in the construction and auto industries, the two industries which consume the bulk of the asbestos.

In 1966, imports reached an all time high in both volume and value (table 1). In 1968 the value of imports of asbestos was $69.7 million. Canada has supplied more than 90 percent of the total quantity of imports of asbestos for many years (table 2).

African countries supply about 6 percent, and Europe and Australia each about 1 percent, of the quantity of U.S. imports (table 2). African asbestos came from the Republic of South Africa and Rhodesia. The Republic of South Africa supplied crocidolite and amosite asbestos, while Rhodesia supplied chrysotile fiber. The United States embargoed imports of asbestos from Rhodesia in January 1967 (Executive Order 11322; also see Executive Order 11419).

Foreign production and trade

During 1963-66 all of the leading asbestos-producing countries increased their output (table 3). Except in the U.S.S.R. and the United States, relatively little of the asbestos is consumed in the countries in which it is mined. Thus, the three important producing countries supplying the great bulk of the international trade of the free world in asbestos are Canada, the Republic of South Africa, and Rhodesia.

Canada has long been the world's leading producer of asbestos. About 95 percent of Canadian production--which is confined entirely to the chrysotile variety--is exported. Estimated figures for 1967 put Canadian asbestos production at about 1.4 million short tons (table 3).

The U.S.S.R. is the second largest producer of asbestos, with production in 1967 estimated at 980,000 short tons (table 3). All of the Soviet mines are state-operated, and trade is conducted under government control.

The Republic of South Africa is the world's only commercial source of amosite and also the world's largest producer of crocidolite asbestos; its output of chrysotile is relatively small. Its total annual production--nearly all exported--averaged about 232,000 short tons in 1962-66 (table 3). Asbestos production in Rhodesia is confined to the low-iron, long-fiber chrysotile variety. Finland is the only important producer of the anthophyllite variety of asbestos.

Table 1.--Asbestos, not manufactured: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production	Imports	Exports	Apparent consumption
	Quantity (1,000 short tons)			
1962	53	676	3	726
1963	66	668	10	724
1964	101	739	27	813
1965	118	720	43	795
1966	126	726	47	805
1967	123	645	48	720
1968	1/	738	41	1/
	Value (1,000 dollars)			
1962	4,677	64,150	598	67,229
1963	5,108	61,739	1,304	65,543
1964	8,143	72,973	3,199	77,917
1965	10,162	70,458	5,294	75,326
1966	11,056	73,100	5,763	78,393
1967	11,102	65,743	6,025	70,820
1968	1/	69,689	4,677	1/

1/ Not available.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Asbestos, not manufactured: U.S. imports for consumption, by principal sources, 1962-68

Year	Canada	Republic of South Africa	All other	Total, all countries
	Quantity (1,000 short tons)			
1962	624	35	17	676
1963	619	37	12	668
1964	667	51	21	739
1965	658	41	21	720
1966	654	63	9	726
1967	602	31	13	645
1968	689	38	11	738
	Value (1,000 dollars)			
1962	54,935	6,318	2,897	64,150
1963	54,011	6,530	1,198	61,739
1964	60,581	9,019	3,373	72,973
1965	60,380	7,218	2,860	70,458
1966	61,439	10,776	885	73,100
1967	59,165	5,339	1,239	65,743
1968	65,344	6,536	2,191	69,689

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Asbestos, not manufactured: World production, by principal countries, 1962-67

(In thousands of short tons)

Country	1962	1963	1964	1965	1966	1967
Canada	1,216	1,276	1,420	1,388	1,479	1,443
U.S.S.R.	1/ 710	1/ 755	810	1/ 865	1/ 925	1/ 980
Republic of South Africa	221	206	216	241	276	1/ 270
Rhodesia	142	142	153	176	175	2/
China 1/	100	110	130	140	140	170
Italy	61	63	76	79	90	1/ 110
United States	53	66	101	118	126	123
Australia	18	13	14	12	13	1
All other	134	130	131	127	134	2/
Total	2,655	2,761	3,051	3,146	3,360	2/

1/ Estimated.
2/ Not available.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Commodity	TSUS item
Asbestos textile products----	518.21

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

For many years the United States has been a net exporter of asbestos textile products. During 1962-67, exports amounted to approximately 2 percent of estimated U.S. production, whereas imports were equivalent to less than 1 percent of production.

Description and uses

The term "asbestos textile products" as used in this summary includes yarns, slivers, rovings, wick, rope, cord, cloth, and tubing either in chief value of asbestos, or of asbestos and any other spinnable fiber, (with or without wire) and articles, made from any of the foregoing, except footware, headware, and gloves. As indicated in headnote 1 (ii) to schedule 3, fibers, yarns, fabrics, or other articles containing asbestos in significant amounts (used in sufficient amounts to impart the peculiar characteristics or properties of asbestos to the product) are included with asbestos and asbestos products in schedule 5 of the TSUS.

In the manufacture of asbestos textile products, asbestos is defiberized and usually blended with cotton, rayon, or other natural or synthetic organic or inorganic fiber.

The fiber mixture is carded to form a loose, bulky, ropelike material known as sliver, which is separated into ribbons, mechanically rubbed, and condensed into untwisted strands known as roving. Roving is the basic component of nearly all asbestos textiles.

Asbestos wick, which is soft and pliable, is produced by loosely twisting strands of roving. Asbestos rope is formed by twisting together two or more strands of asbestos wick. Asbestos wick and rope are used largely in caulking applications, for packing valves, and as an oven sealant.

Asbestos yarn is produced by spinning and twisting strands of roving. The yarn is generally woven into tape, cloth, or tubing, or formed into cord. Asbestos tape, cloth, and tubing may be made with an embedded light-gage wire for reinforcement purposes. Cord is formed by tightly twisting together strands of yarn. The principal

uses for asbestos tape, cloth, tubing, and cord are in woven brake and clutch facings, in theater curtains and protective fire fighting clothing, and in covers for ironing boards, and as supporting and insulating mediums for electric-resistance wires in glass and chemical works. The U.S. Navy requires an outside jacket of asbestos cloth over pipes and boilers on all its vessels.

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
518.21	Yarn, slivers, rovings, wick, rope, cord, cloth, tape, and tubing, of asbestos, or of asbestos and any other spinnable fiber, with or without wire, and articles of any of the foregoing.	8% ad val.	6% ad val.	4% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, which had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 20, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption

During 1962-66, the value of apparent annual U.S. consumption of asbestos textile products ranged from $43.9 million in 1963 to $49.5 million in 1966 (table 1) and averaged $48 million. It is believed that domestic consumption was at a record or near record level in 1967.

U.S. producers

In 1967, asbestos textile products were produced by 10 firms with 16 plants. The firms (which are generally single-plant operations) are situated principally in Pennsylvania, North Carolina, and South Carolina. About two-thirds of the U.S. output is produced by about half of the firms. Most of the firms produce a wide range of asbestos textiles and other asbestos products. In general, production of asbestos textile products is a minor part of a firm's total operations. One producer is a subdivision of a major U.S. rubber manufacturer; several have foreign affiliations. One of the large firms secures most of its crude asbestos from its own mines in Canada and Africa.

U.S. production

During 1962-66 the value of annual U.S. production of asbestos textiles ranged from $44.5 million in 1963 to an estimated $50 million in each of the years 1965 and 1966, and it seems likely that production in 1967 exceeded the latter figure.

The breakdown of production of asbestos textile products for 1966 is estimated to have been as follows: Cloth, 44 percent; yarn and cord, 21 percent; roving and other forms of carded asbestos, 17 percent; tape, 9 percent; and wick, rope, and tubing, 9 percent.

U.S. exports

The value of annual U.S. exports of asbestos textiles products in 1963-67, averaged $1.2 million, compared with an average of $0.8 million in the preceding 5-year period. In 1962-66, exports amounted to approximately 2 percent of U.S. production; in 1967, however, they constituted nearly 4 percent of production.

Shipments to Canada accounted for most of the exports. Other important export markets have been the Netherlands and Venezuela.

U.S. imports

The value of annual U.S. imports of asbestos textiles in 1963-65 was stable, at a level slightly below $0.3 million, but increased markedly in the following 2 years, amounting in 1967 to more than $1 million (table 1), equivalent to about 2 percent of estimated domestic production. In 1968, the value of asbestos textile imports was $1.3 million.

In 1967 the United Kingdom supplied about 47 percent of all imports, in terms of value, while Japan supplied 24 percent, and Canada 21 percent. Imports from Japan were small until 1966, when large shipments started entering the United States from that country (table 2). The articles imported from Canada consist mainly of intra-company transfers.

Foreign production and trade

Two British firms and an American firm produce most of the free world's supply of crude asbestos and therefore have substantial control over the production of asbestos textiles. The British firms have subsidiaries which are large producers and exporters of these textiles. These subsidiaries purchase crude asbestos in a competitive market. General policy control is in the hands of the British parent organization, but in areas of production and marketing, the producing subsidiaries are autonomous.

Table 1.--Asbestos textile products: U.S. production, imports for consumption, exports domestic merchandise, and apparent consumption, 1962-68

(In thousands of dollars)

Year	Production	Imports	Exports	Apparent consumption
1962	1/ 48,000	462	1,008	47,444
1963	44,538	274	952	43,860
1964	1/ 47,000	289	793	46,496
1965	1/ 50,000	276	1,067	49,209
1966	1/ 50,000	872	1,326	49,546
1967	2/	1,007	1,790	2/
1968	2/	1,324	1,802	2/

1/ Estimated on the basis of the average value of U.S. production of all asbestos products.
2/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Asbestos textile products: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)						
United Kingdom	250	268	323	245	586	597	477
Japan	4	15	20	97	307	424	498
Canada	423	62	30	87	343	631	942
All other	111	65	32	9	18	71	53
Total	788	410	405	438	1,254	1,723	1,970
	Value (1,000 dollars)						
United Kingdom	179	196	245	201	469	474	407
Japan	9	8	10	52	164	237	294
Canada	218	42	18	19	225	214	571
All other	56	28	16	4	14	82	52
Total	462	274	289	276	872	1,007	1,324

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Articles in part of asbestos and hydraulic cement	518.41-.44

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1969).

U.S. trade position

U.S. imports and exports of all asbestos cement products were equivalent to less than 5 percent of estimated production, in terms of value, in any year in the period 1962-66. Imports of asbestos pipes, tubes, and fittings have declined steadily in both quantity and value since 1963.

Description and uses

Portland cement and asbestos fibers are used in combination in a great variety of building materials to produce products having weather and fire resistant properties. In a wet state, this material can be molded into almost any desired shape. When dry, it is rigid, strong, and durable. The ratio of asbestos fibers to cement in such products varies from 15 to 25 percent, depending on the length and class of the fibers used and the product being made. Chrysotile asbestos is the principal fiber used in making asbestos cement products. Crocidolite is sometimes used, but in small amounts because of its low strength; amosite fiber is rarely, if ever, used for such purposes. A product which contains a commercially significant quantity of "asbestos and hydraulic cement" is "in part" of such materials and unless more specifically provided for elsewhere in the TSUS is covered by this summary.

Asbestos cement products are particularly useful in industrial buildings and private housing. Principal products made from asbestos cement are shingles, roofing, siding, flat and corrugated sheets, wallboard, and pipes. Asbestos cement pipes are manufactured for use in the construction of sewage and water systems.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Articles in part of asbestos and hydraulic cement:			
518.41	Pipes and tubes and fittings therefor.	0.3¢ per lb.	0.24¢ per lb.	0.15¢ per lb.
518.44	Other	0.225¢ per lb.	0.15¢ per lb.	0.1¢ per lb. 1/

1/ This rate is to become effective on Jan. 1, 1971.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968, which had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967 under the General Agreement on Tariffs and Trade. The concession on item 518.41, which amounts to a reduction of 50 percent, is being put into effect in five annual stages; that on item 518.44 is being put into effect in four annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). Based on imports in 1968 the ad valorum equivalent of the 1968 rates for item 518.41 was 5.9 percent; and for item 518.44 was 1.5 percent.

U.S. consumption

During 1962-66, the value of apparent annual U.S. consumption of all asbestos cement products averaged about $170 million and showed no specific trend (table 1). The annual average was about the same for the preceding 5-year period. Consumption of asbestos cement shingles, roofing, and siding is mainly dependent on new construction and the home-remodeling market. Sales of asbestos cement products are made primarily to distributors, contractors, and municipalities.

During 1962-66, estimated apparent annual consumption of pipes, tubes, and fittings of asbestos cement had an average value of $104 million and showed no specific trend (table 2). Tubes and pipes accounted for about 58 percent of the total value of all asbestos cement products consumed during 1962-66.

Consumption activity in the public works markets, which create the demand for pipe, has not changed for the past several years. Asbestos cement pipe products are in direct competition with cast iron, clay, plastic, cement, and wood pipes.

U.S. producers

Approximately 16 firms in the United States produce asbestos cement products. About 10 of these firms account for more than 90 percent of total U.S. production; these same firms are also major producers of other types of asbestos products. Several of the large firms produce a relatively complete line of building and construction materials. The small firms derive most of their income from the production and sale of asbestos cement products.

In 1967, four companies with 14 plants produced asbestos cement pipes and tubes in the United States. One company has seven plants, another has five plants, and the two remaining companies have one plant each.

The plants for the asbestos cement industry are concentrated in the northeastern States, California, and the gulf coast area.

Because their high weight-to-value ratio results in high transportation costs, asbestos cement products are usually marketed in areas near the plants where they are manufactured. The cement used in the manufacture of these products is procured locally.

U.S. production

Estimated U.S. production of asbestos cement products--including pipes, tubes, and fittings--was valued at $173 million both in 1965 and in 1966 (table 1). Estimated production of asbestos cement products during 1962-66 had an average value of $169 million a year. In the same period, the value of estimated annual production of asbestos cement pipes, tubes, and fittings averaged $100 million a year (table 2).

U.S. exports

During 1962-66, the average value of annual U.S. exports of asbestos cement products was $3 million and showed no specific trend. In 1968 the value of exports was $3.6 million.

The principal export market for asbestos cement products is Canada.

U.S. imports

From a high of $7.0 million in 1963, the value of annual U.S. imports of asbestos cement products decreased steadily to $4.1 million in 1967 (table 1). Even with the decline, average annual imports in 1963-67, valued at $5.5 million, were larger than those in the preceding 5-year period, when the average value was $4.2 million. Imports in 1968 amounted to $5.5 million.

Imports of asbestos pipes, tubes, and fittings declined every year from 1963, when they were valued at $5.1 million, to 1967, when they were valued at $1.9 million (table 2).

In 1967, shipments from Belgium accounted for more than 68 percent of the total value of imports of "other" articles in part of asbestos and hydraulic cement, while those from Canada accounted for approximately 25 percent (table 3).

For many years prior to 1966 Belgium had been the main supplier of asbestos cement pipes, tubes, and fittings to the United States. In 1966 and 1967 Japan was the major supplier of these products to the United States. In 1967 shipments from Japan accounted for more than 54 percent of the value of total imports of pipes, tubes, and fittings; the remaining imports, which were small, came mainly from Mexico, Italy, Canada, and Belgium (table 4).

Foreign production and trade

Almost all of the developed and most of the lesser developed countries are producers of asbestos cement products. The lesser developed countries specialize in making sheets and shingles since the manufacture of pipes is limited because of high plant capitalization and the sophisticated technical processes involved. Two British holding companies operate or have interest in plants producing asbestos cement products in many parts of the world. Some of these plants are situated in Rhodesia, the Republic of South Africa, and Canada, the countries in which asbestos is mined.

A large U.S. building-material firm operates plants producing asbestos cement products and pipe in Belgium, Canada, and Mexico.

Asbestos cement pipe made in foreign countries can meet the specifications set up by various municipalities and other Government and private agencies in the United States.

Table 1.--Asbestos and hydraulic cement articles: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production	Imports	Exports 1/	Apparent consumption
	Quantity (1,000 pounds)			
1962	2/	85,388	18,127	2/
1963	2/	104,754	26,939	2/
1964	2/	101,598	26,204	2/
1965	2/	95,434	23,358	2/
1966	2/	72,342	29,966	2/
1967	2/	57,930	45,696	2/
1968	2/	88,626	33,094	2/
	Value (1,000 dollars)			
1962	3/ 178,000	5,263	2,343	172,737
1963	3/ 154,450	6,968	3,355	158,063
1964	3/ 165,000	6,236	3,227	168,009
1965	3/ 173,000	5,833	2,722	176,121
1966	3/ 173,000	4,565	3,170	174,395
1967	2/	4,052	4,365	2/
1968	2/	5,458	3,572	2/

1/ Exports are not strictly comparable with production and imports. Export statistics include some asbestos articles that do not contain cement and, at the same time, exclude some asbestos cement articles.

2/ Not available.

3/ Estimated on the basis of total U.S. production of all asbestos products.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Asbestos cement, pipes and tubes and fittings: U.S. production, imports for consumption, and apparent consumption, 1962-68

Year	Production	Imports	Apparent consumption
	Quantity (1,000 pounds)		
1962	1/	73,034	1/
1963	1/	96,193	1/
1964	1/	84,181	1/
1965	1/	79,135	1/
1966	1/	55,661	1/
1967	1/	42,395	1/
1968	1/	69,736	1/
	Value (1,000 dollars)		
1962	2/ 101,000	3,960	104,960
1963	2/ 88,000	5,116	93,116
1964	2/ 96,000	4,507	100,507
1965	2/ 106,000	4,081	110,081
1966	2/ 108,000	2,591	110,591
1967	1/	1,916	1/
1968	1/	2,971	1/

1/ Not available.
2/ Estimated.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note.--Exports of asbestos cement pipes and tubes and fittings are believed to be negligible.

Table 3.--Asbestos cement articles other than pipes and tubes and fittings: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)						
Belgium	7,147	10,592	11,078	9,717	9,448	9,045	10,899
Canada	4,271	2,663	5,074	5,416	5,823	5,183	6,659
All other	936	3,228	265	1,166	1,410	1,307	1,332
Total	12,354	16,483	17,417	16,299	16,681	15,535	18,890
	Value (1,000 dollars)						
Belgium	938	1,489	1,365	1,272	1,477	1,454	1,777
Canada	327	324	291	387	372	530	603
All other	38	37	74	93	125	152	107
Total	1,303	1,850	1,730	1,752	1,974	2,136	2,487

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Asbestos cement pipes and tubes and fittings: U.S. imports for consumption, by principal sources, 1962-68

Source	1962	1963	1964	1965	1966	1967	1968
	Quantity (1,000 pounds)						
Japan	9,000	11,946	16,327	18,022	23,965	26,314	44,835
Mexico	10,934	9,365	9,484	11,799	6,799	4,366	9,613
Italy	19,554	16,784	9,169	7,135	4,886	4,360	7,079
Canada	523	2,584	10,111	6,427	230	2,036	19
Belgium	25,769	38,607	29,063	24,612	11,232	2,859	6,729
Israel	1,063	3,992	1,143	4,171	1,458	-	-
All other	6,191	12,914	8,884	6,969	7,091	2,460	1,461
Total	73,034	96,192	84,181	79,135	55,661	42,395	69,736
	Value (1,000 dollars)						
Japan	421	513	689	815	988	1,040	1,759
Mexico	884	787	777	836	347	240	516
Italy	754	656	419	342	235	215	312
Canada	38	91	540	276	38	179	10
Belgium	1,569	2,313	1,629	1,294	605	140	315
Israel	52	177	55	203	64	-	-
All other	242	579	398	315	314	102	59
Total	3,960	5,116	4,507	4,081	2,591	1,916	2,971

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Asbestos articles	518.51

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

In recent years the United States has been a substantial net exporter of the asbestos articles covered by this summary. Imports during 1962-66 were equivalent to about 1 percent of production.

Description and uses

The articles covered by this summary include asbestos paper, millboard and articles made therefrom, packing, gaskets, insulation, and molded friction material. 1/ Asbestos paper is used to make many articles: Roofing felt; linings for cabinets, mufflers, and electrical appliances; thermal insulation for applications in manufacturing plants; and asbestos felts which, when saturated with tar or asphalt, serve as corrosion protection for underground pipelines. Millboard is used as fireproof wallboard or other fireproof structural material. It serves as linings for heaters, stoves, furnaces, kilns, and table pads and mats, and for various uses in industrial plants. Molded friction material consists of asbestos mixed with or impregnated with rubber. Such material is used chiefly for making brake linings and clutch facings. Packing is a compressible and resilient material used as a seal on moving parts of certain machinery, and gaskets are used in the joining of flanges or pipelines.

1/ Articles made of asbestos that are discussed in other summaries include asbestos and hydraulic cement products (items 518.41 and 518.44) and footwear, headgear, and gloves of asbestos, and laminated or reinforced asbestos containing plastics, including tile (provided for in schedule 7 of the TSUS).

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
518.51	Articles, not specially provided for, of asbestos.	9% ad val.	7% ad val.	4.5% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, which had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption and production

The value of apparent annual U.S. consumption of asbestos products increased from $95 million in 1962 to $111 million in 1966 (see table). The value of annual consumption in 1962-67 averaged $107 million. Consumption of asbestos products has been largely dependent on the level of production in the automotive and other large manufacturing industries. In each of the years from 1962 to 1966, U.S. production supplied more than 98 percent of consumption.

U.S. producers

About 65 U.S. firms produce the asbestos products covered by this summary. Seventy percent of the production of these asbestos articles is concentrated in New Jersey, Pennsylvania, New York, Indiana, Illinois, Ohio, and California. Most of the remainder of the output is produced in Connecticut, Massachusetts, Minnesota, and Missouri.

Most of the firms also produce other asbestos products (covered in separate summaries), such as asbestos cement products and asbestos textile products. About 20 of the larger firms in the industry produce construction materials. U.S. imports supplied approximately 90 percent of the raw asbestos used in the production of the articles discussed in this summary.

U.S. exports

During 1962-67 the value of annual U.S. exports averaged $14 million and ranged from $10.7 million in 1964 to $17.8 million in 1967. Exports during this period amounted to approximately 10 percent of domestic production. The principal foreign markets for U.S. exports of asbestos products have been to Canada, the European Economic Community, and Japan. A substantial part of the exports were for replacement parts for American-made automobiles, trucks, and other machines sold abroad. The principal items exported were clutch facings, brake linings, and other friction materials. Exports in 1968 amounted to $19.1 million.

U.S. imports

The value of annual U.S. imports of asbestos products, not elsewhere enumerated, increased from $309,000 in 1962 to $1.5 million in 1965, then declined to $1.4 in 1966 and 1967. The value of annual imports during 1962-67 averaged $1,000,000. In 1968 the value of imported asbestos articles was $994,000.

Canada and the United Kingdom are the main foreign suppliers of U.S. imports of these products; during 1967 Canada supplied about 45 percent, based on value, and the United Kingdom 38 percent of the total U.S. imports. Some of the imports from Canada were intracompany shipments.

Foreign production and trade

Canada and the United Kingdom are the leading foreign producers of asbestos products. Canada has the largest source of raw asbestos in the free world. More than a dozen Canadian firms produce asbestos products. Many of these are either directly or indirectly controlled by United States or British firms that also produce asbestos products. Two British holding companies operate asbestos product plants in England and in many other countries.

Asbestos articles, not elsewhere enumerated: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

(In thousands of dollars)

Year	Production	Imports	Exports 1/	Apparent consumption
1962	2/ 106,000	309	10,909	95,400
1963	113,877	661	11,990	102,548
1964	2/ 121,000	605	10,664	110,941
1965	2/ 128,000	1,530	15,349	114,181
1966	2/ 127,000	1,455	17,452	110,988
1967	3/	1,439	17,758	3/
1968	3/	944	19,129	3/

1/ Exports include small quantities of woven asbestos products, and therefore are not strictly comparable with production and imports.

2/ Estimated on the basis of the value of all the asbestos produced in this year.

3/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Commodity	TSUS item
Burrstones, rough	519.01
Hones, whetstones, oilstones, and polishing stones	519.61
Burrstones, manufactured	519.71
Solid natural stone abrasive wheels	519.81

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

U.S. production, imports, and exports are small. Exports and imports are approximately equal.

Description and uses

This summary covers burrstone in rough blocks and grinding, polishing, and sharpening stones and wheels cut or fashioned from naturally occurring abrasive rock. Products composed of artificial abrasives or of natural abrasives not in the form of solid natural stone are covered in this volume by other summaries on abrasive products.

Burrstone (item 519.01), which is found in Europe, is a tough, porous siliceous rock that is cut into wedges and bound up with iron straps into circular millstones. In the United States, millstones are cut whole from such rocks as sandstone, granite, or quartz conglomerate; these articles, if imported, would be provided for in item 519.81. Millstones are usually mounted parallel on a central axis so that the flat grinding surfaces are face to face. Circular stones mounted so that the edges are the grinding surfaces are called chaser stones. The term "wheels" is defined in the TSUSA as embracing rotary cutters, disks, and other circular bodies designed to rotate on a central axis.

Grindstones and pulpstones are solid stone wheels (item 519.81) of various sizes used in a variety of grinding and sharpening operations. The stones of smaller diameter are usually cut from fine-grained sandstone and are used in hand-grinding operations, while the larger wheels are made from coarse-grained stone and are used for machine grinding.

BURRSTONES, WHETSTONES, HONES, OILSTONES, AND SOLID NATURAL STONE WHEELS

The hones, whetstones, oilstones, and polishing stones included here are those designed to be held in the hand, whether having handles or without handles. These stones are usually cut from novaculite, a very fine-grained quartz rock, and from fine-grained sandstone. In recent years, however, cast shapes (items 519.83 and 519.97) manufactured from natural and artificial abrasives have largely supplanted the natural stone.

Millstones are used to grind various substances, including grain, paint pigments, and mineral fillers; the stones referred to as pulpstones are used to grind wood. Circular grindstones, as well as hand-held stones, are used for sharpening a variety of cutting utensils and articles. In addition, the stones included here are used to smooth and polish many manufactured products.

U.S. tariff treatment

Essentially, the duty-free status for the articles in this summary was provided for under paragraphs 1640 (item 519.71), 1692 (519.61 and 518.81) and 1775 (519.01) of the Tariff Act of 1930, as originally enacted. The duty-free status of the articles provided for under paragraphs 1692 and 1775 was bound under the General Agreement on Tariffs and Trade, effective January 1, 1948. The duty-free status of item 519.71 was bound in the Kennedy Round, effective January 1, 1968.

U.S. consumption, producers, and production

No data on U.S. consumption and production of the commodities covered in this summary are available. The value of annual domestic consumption during 1962-66 is estimated to have been about $200,000. Production and consumption of natural stone abrasives have been on the decline for many years as artificial abrasives and natural abrasive powders have replaced them in many applications.

Solid natural stone abrasive products were produced by a few companies, situated principally in the Midwest. Grindstones were produced in Ohio, and oilstones and other sharpening stones, in Arkansas and Indiana.

U.S. exports

For some years prior to 1965, exports of the natural stone abrasive products covered in this summary were valued at about $60,000 annually. Beginning with 1965, these products were no longer reported separately in official statistics. U.S. exports consisted principally

of hand-held sharpening stones sent to Canada, West Germany, Japan, and other countries, and small quantities of grindstones shipped to various countries.

U.S. imports

Imports of the natural stone abrasive products covered in this summary in 1964-68 were as follows:

Year	Value (1,000 dollars)
1964	59
1965	52
1966	101
1967	91
1968	85

Nearly all of the U.S. imports in 1964-68 were hones, oilstones, and whetstones entered from Japan, West Germany, and the United Kingdom. Burrstones bound up into wheels were imported in negligible quantities from the United Kingdom.

Commodity	TSUS item
Pumice for use in concrete masonry products	519.05
Pumice, crude	519.11, -.14
Pumice, ground	519.31
Pumice articles, not elsewhere enumerated	519.93, 523.61

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

For some years the United States has been on a substantial import basis with respect to the pumice and articles of pumice covered in this summary.

Description and uses

This summary includes both pumice and pumicite. Pumice is a white to gray, highly cellular, glassy, volcanic rock. Pumicite (also known as volcanic ash) is a material consisting of naturally cemented or uncemented, rounded, sand-size particles of natural volcanic glass. Both materials are of volcanic origin, and the present form depends on the original chemical composition and manner of ejection from the volcano. The term "pumice", wherever used alone in this summary, unless otherwise indicated, includes pumicite.

Until the mid-1930's the only important domestic use of pumice and pumicite was as an abrasive. Thereafter, the use of pumice (but not pumicite) as an aggregate in lightweight concrete increased rapidly, as did the use of pumicite as an additive in concretes.

Pumice is used in concrete masonry products either as aggregate in the form of lumps and small pieces meeting established size specifications or as a pozzolanic additive 1/ in the form of a very fine powder. Crude pumice is used as roadstone or railroad ballast. The term "crude pumice" in this summary includes pumice crushed to facilitate transportation.

When used in abrasive compositions, pumice is usually hand-selected for uniformity of color and physical properties, and the selected material is then ground and sized. Ground pumice that meets less

1/ A pozzolanic material is any inherently noncementitious material which in the presence of lime forms a hydraulic cementitious material and thereby replaces a part of the normal portland cement requirement in a given concrete mix.

stringent quality and grading specifications than does that for abrasive use is utilized in plasters, fertilizers, insecticides, matches, paints, and many other compositions.

Abrasive blocks, bricks, and rubbing stones are cut from lump pumice, or molded or cast from a mixture of a binder and sized pumice grains. In determining the component material of chief value of abrasive articles in chief value of pumice (item 519.93), only the abrasive components are compared. Wall masks are molded from a mixture of a binder and sized pumice grains, while other decorative and utilitarian (nonabrasive) articles are either cut from lump pumice or molded from a mixture of a binder and sized pumice grains.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
519.05	Pumice stone to be used in the manufacture of concrete masonry products such as building blocks, bricks, tiles, and similar forms.	Free	1/	1/
	Pumice, crude or crushed merely to facilitate transportation to the United States:			
519.11	Valued not over $15 per ton. 2/	0.0425¢ per lb.	0.034¢ per lb.	0.02¢ per lb.
519.14	Valued over $15 per ton. 2/	0.08¢ per lb.	0.06¢ per lb.	0.04¢ per lb.
519.31	Pumice, in grains, or ground, pulverized, or refined.	0.35¢ per lb.	0.28¢ per lb.	0.17¢ per lb.
519.93	Millstones (except burrstones, manufactured or bound up into millstones) and abrasive articles other than wheels, not elsewhere enumerated, of pumice.	14%	11%	7%
523.61	Articles other than abrasive wheels, not elsewhere enumerated, of pumice.	14%	11%	7%

1/ Free rate bound by trade conference, effective January 1, 1968.
2/ The term "ton" here means 2,240 pounds.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions on items 519.11, 519.14, 519.31, 519.93, and 523.61 granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). The duty-free status of item 519.05 was bound by the trade conference.

The ad valorem equivalents of the 1968 rates, based on imports in 1968, were as follows for the items in this summary dutiable at specific rates:

Item	Percent
519.11	14.6
519.14	5.2
519.31	16.3

U.S. consumption

Since exports are negligible, U.S. consumption of pumice is virtually equivalent to production plus imports. The domestic consumption has varied considerably in recent years, reaching a record of 1.3 million short tons 1/ in 1964 (table 1). Average annual consumption was 913,000 tons in 1962-66, compared with 860,000 tons in 1957-61.

U.S. producers

In 1967 pumice was produced by 129 operators of 152 mines in 15 States, all west of the Mississippi River. One company accounted for the bulk of the U.S. output of abrasive grade pumice, whereas most of the remaining firms, some of them very small, produced pumice for use as aggregate, railroad ballast, and roadstone.

1/ The term "tons" used hereafter in this summary refers to short tons.

U.S. production

U.S. production of pumice and pumicite was at a high level in 1963-64, with output in each of those years exceeding 1 million tons (table 1). Production in 1965, however, was considerably less than half that of 1964. Output increased moderately in 1966 and again in 1967, but failed to approach the 1.2 million tons produced in 1964. The average annual production in 1962-66 was 756,000 tons, compared with 860,000 tons annually in the period 1957-61.

New Mexico, California, Hawaii, and Oregon are usually the major producing States in terms of quantity. Most abrasive grade pumice is produced in New Mexico, while pumice used for aggregate, railroad ballast, and road construction is produced in many States. Pumicite is produced mainly in Kansas, Nebraska, and Oklahoma.

U.S. exports

U.S. exports of pumice were reported as such for the first time in 1966. Exports amounted to 298 tons, valued at $66,000, in 1966; 153 tons, valued at $21,000, in 1967; and 623 tons, valued at $54,000, in 1968. Because of the high average value, most or all of this material is presumed to have been abrasive grade material. More than two-thirds of the exports in those 3 years went to Canada.

U.S. imports

Since being placed on the free list by congressional action (Public Law 86-325) in 1959, U.S. imports of pumice (except pumicite) for use in concrete masonry products have grown substantially, reaching a record volume in 1968, when 299,000 tons, valued at $615,000, was imported (table 2). Most of this imported material came from Greece and Italy and was used on the east coast, where it competed with domestically produced expanded clay, shale, and slag and, to a limited extent, with expanded perlite and exfoliated vermiculite; the imported material did not compete with domestic pumice.

U.S. imports of crude pumice, whether valued under or over $15 per ton of 2,240 pounds, come almost entirely from Italy and are ground and sized in this country for use in abrasive compositions. Imported ground, pulverized, or refined pumice also is mostly Italian material and is already ground and sized for direct use in abrasive compositions and acoustical plasters. In 1964-68 the value of annual imports of ground, pulverized, or refined pumice ranged from $76,000 to $163,000 (table 3), and averaged $118,000. This average amount

was equivalent to about one-third of the value of average annual production of domestic abrasive pumice in that period. Imported abrasive pumice competes principally in the Midwest with U.S. pumice of similar quality.

West Germany and Italy supply most of the imported pumice articles, whether of abrasive or nonabrasive type; the value of annual imports of pumice articles in 1964-68 ranged from $17,000 to $26,000. There is probably little or no domestic production of articles similar to imported items.

The small imports of abrasive pumice articles consist largely of shaped block pumice mounted on a handle or in a holder, while imported nonabrasive pumice articles comprise wall masks and other decorative items.

Table 1.--Pumice: U.S. production, imports for consumption, and apparent consumption, 1962-68

Year	Production	Imports	Apparent consumption
	Quantity (1,000 short tons)		
1962	533	87	620
1963	1,050	114	1,164
1964	1,165	110	1,275
1965	483	191	674
1966	549	283	832
1967	776	246	1,022
1968	1/	312	1/
	Value (1,000 dollars)		
1962	3,206	307	3,513
1963	3,321	352	3,673
1964	4,094	422	4,516
1965	2,442	608	3,050
1966	2/ 2,629	814	3,443
1967	2/ 1,446	629	2,075
1968	1/	805	1/

1/ Not available.
2/ Value reported on an f.o.b. mine basis only, rather than mine and/or grinding plant, as previously reported.

Source: Production compiled from official statistics of the U.S. Bureau of Mines; imports compiled from official statistics of the U.S. Department of Commerce.

Note.--U.S. exports are negligible.

Table 2.--Pumice to be used in concrete masonry products: U.S. imports for consumption, by principal sources, 1964-68

Source	1964	1965	1966	1967	1968
	Quantity (1,000 short tons)				
Greece	60	141	137	125	184
Italy	28	23	132	112	115
Albania	13	-	-	-	-
Spain	-	12	-	-	-
All other	-	1	1/	1	-
Total	101	177	269	238	299
	Value (1,000 dollars)				
Greece	129	306	258	271	367
Italy	100	53	302	231	248
Albania	22	-	-	-	-
Spain	-	22	-	-	-
All other	-	1	2/	2	-
Total	251	382	560	504	615

1/ Less than 500 tons.
2/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Pumice, crude 1/, or in grains, and articles other than wheels, not elsewhere enumerated, of pumice: U.S. imports for consumption, 1964-68

Item	1964	1965	1966	1967	1968
	Quantity (1,000 pounds) 2/				
Crude, or crushed merely to facilitate transportation: 3/					
Valued not over $15 per ton 4/	8,348	16,724	16,115	9,470	17,037
Valued over $15 per ton 4/	2,649	3,189	2,669	1,934	1,836
In grains, or ground, pulverized, or refined 3/	6,184	7,061	8,621	4,167	6,381
	Value (1,000 dollars)				
Crude, or crushed merely to facilitate transportation: 3/					
Valued not over $15 per ton 4/	38	65	57	28	44
Valued over $15 per ton 4/	27	34	34	21	25
In grains, or ground, pulverized, or refined 3/	105	127	163	76	121
Abrasive articles	4	9	11	5	5
Other articles	16	17	14	17	12

1/ Does not include pumice stone to be used in the manufacture of concrete masonry products such as building blocks, bricks, tiles, and similar forms.

2/ Quantity not reported for abrasive articles and other articles, not specially provided for.

3/ Virtually all from Italy.

4/ Ton of 2,240 pounds.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Abrasives, natural and artificial:	
Crude	519.17, -.21
Ground	519.34, -.37

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States imports significant tonnages of only one of the crude natural abrasives, i.e., corundum; it exports substantially greater amounts of ground natural abrasives, i.e., garnet and emery, than it imports. The bulk of the U.S. requirements for crude silicon carbide and other artificial abrasives are imported; most of the imports, however, are by U.S. firms operating Canadian plants to produce material for that firm's U.S. operations. U.S. exports of refined silicon carbide and artificial abrasives are sizable.

Description and uses

Abrasive materials are divided, according to origin, into two major types, natural and artificial.

Natural abrasives are natural minerals having physical and chemical characteristics which make them suitable for use as abrasives. Among the more common natural abrasives are the harder, higher quality abrasives corundum, pumice, emery, garnet, and flint, and the softer, or milder, minerals rottenstone and tripoli. All of these minerals, except pumice, are included in this summary, whether or not of abrasive quality. Pumice is covered in a separate summary in this volume (items 519.05-.14, 519.31, 519.91, and 523.61).

This summary does not include sand, natural or synthetic diamond dust or powder, and crushed or powdered glass.

Emery and corundum are used as abrasive grains in polishing compositions and in coated abrasive products such as papers, cloths, and belts; ground emery is also used in nonslip concrete floors. Garnet is used mainly in coated abrasive products and as an abrasive grain in sandblasting. Crude flint stones are used principally in pebble mills in which ceramic raw materials are ground to meet low-iron specifications. Pulverized rottenstone and tripoli are used as abrasive grains in scouring powders and in abrasive articles used for buffing wood, painted surfaces, fingernails and calluses, and other so-called soft materials.

Artificial abrasives, comprising almost solely silicon carbide and aluminum oxide, are manufactured materials produced by fusing proportioned batches of the necessary raw materials and crushing the cooled and solidified mass. Artificial abrasives are more efficient than even the better grades of natural abrasives, and therefore artificial abrasives are usually employed in industrial grinding operations.

Most natural and artificial abrasives must be ground and sized before use, and at least one (garnet) is usually heat-treated to improve its properties.

Natural or artificial abrasive materials crushed merely to facilitate transportation are generally considered "crude" for tariff purposes.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
519.17	Emery, natural corundum, flint, rottenstone, and tripoli, crude or crushed merely to facilitate transportation.	Free	1/	1/
519.21	Crude silicon carbide and crude artificial abrasives.	Free	1/	1/
	Emery, natural corundum, flint, rottenstone, tripoli, garnet, silicon carbide, and artificial abrasives, in grains, or ground, pulverized, or refined:			
519.34	Rottenstone and tripoli.	Free	1/	1/
519.37	Other	0.5¢ per lb.	0.4¢ per lb.	0.2¢ per lb. 2/

1/ Duty-free status not affected by the trade conference.

2/ This rate, as well as those for 1970 and 1971, is contingent; see footnote 1 to Staged Rates and Historical Notes to Pt. 1 of Schedule 5 of the TSUSA-1969, as shown in appendix A to this volume.

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification (contingent on certain conditions) resulting from a concession on item 519.37 granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967 under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of about 50 percent, is being put into effect, subject to the above-noted contingency, in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates). Under the Tariff Act of 1930, as originally enacted, duty free status was provided for as follows: emery ore, corundum ore, and crude artificial abrasives, paragraph 1672; natural flint and natural flint stones, unground, paragraph 1679; and rottenstone and tripoli, crude or manufactured, paragraph 1775.

Based on imports in 1965, the average ad valorem equivalent of the 1968 specific rate of duty on item 519.37 was 3.0 percent.

Comment

Generally speaking, each type of abrasive covered here is utilized more on the basis of particular suitability for a given use than on the basis of initial cost; there is comparatively little competition between the different materials.

Emery.--Annual U.S. consumption of ground emery is estimated to range from 12,000 to 15,000 tons, 1/ with approximately 80 percent domestically produced and the remainder imported, mainly from Turkey and Greece. Commercial production of emery in the United States is confined to Westchester County, N.Y., where three firms each operating one mine reported an output in 1966 of 11,000 tons valued at $210,000 (table 1). 2/ Exports, which are fairly small, go largely to Canada.

Natural corundum.--Natural corundum suitable for use as an abrasive is not produced commercially in the United States, and therefore the entire U.S. requirement of about 2,000 tons a year has been imported for many years, principally from Southern Rhodesia and largely by one importer-processor. Imports of natural corundum from Southern Rhodesia, however, were prohibited by Executive Order 11419, issued in May 1968.

1/ Hereafter in this summary the term "tons" refers to short tons, the domestic unit of quantity.

2/ Production data for 1967 were not published, to avoid disclosing individual company confidential data.

Flint.--Production of flint and flint pebbles and stones suitable for use in ceramic grinding mills is negligible; domestic requirements of about 10,000 tons a year are met by imports from France, Denmark, and Belgium.

Rottenstone and tripoli.--Little or no rottenstone or tripoli is imported, either in crude or ground form. U.S. consumption of ground or refined rottenstone and tripoli approximates domestic production, which averaged about 58,000 tons a year during 1962-66. Rottenstone is produced in Pennsylvania by two companies, and tripoli, in Missouri, Illinois, Oklahoma, Arkansas, and Alabama by some half dozen firms, most of them small although one is a division of a major producer of a wide range of abrasive products. A moderate quantity of ground or refined rottenstone and tripoli is exported.

Artificial abrasives.--About half a dozen U.S. companies produce crude artificial abrasives, for their own use. Most of the crude material is produced in Canada for economic reasons, chiefly because of the availability of low-cost electric power. The bulk of the Canadian crude artificial abrasives is shipped into the United States for grinding, refining, and use; there is little open-market selling of the crude material. During 1962-66, average annual U.S. imports (and, hence, apparent consumption) of the two major types of crude artificial abrasives were as follows: silicon carbide, 80,000 tons, valued at $10 million; aluminum oxide, 151,000 tons, valued at $16 million. The record year for imports of silicon carbide was 1968, when 106,000 tons were entered; of aluminum oxide, 1966, 183,000 tons (table 2).

No statistics are available on the production of ground and refined artificial abrasives, but it is known that milling losses during the grinding and refining range from 10 to 20 percent of the tonnage of crude materials, and that the processing adds substantially to the value of the crude materials.

U.S. exports exceed imports of ground and refined artificial abrasives by a sizable margin. In 1965-68, annual exports of both fused aluminum oxide and the carbide abrasives were each in the value range of $4.5 million to $6.3 million (tables 3 and 4).

U.S. imports of ground and refined artificial abrasives have generally increased, and in 1967 had a total value of about $2 million (table 5); most of these imports were from Canada. A large part of the imports of ground and refined artificial abrasives are brought in by domestic producers for their own use, and frequently from their own foreign subsidiaries; most of these materials consist of products not manufactured domestically.

Garnet.--All or virtually all of the U.S. requirements for ground abrasive garnet are supplied domestically from two mines in New York and two in Idaho. Production of abrasive garnet increased substantially from 1963 to 1966 (table 1), and in 1962-66 averaged 17,000 tons a year, valued at $1.6 million. Output in 1967 was slightly lower than in the record year, 1966. A moderate tonnage of abrasive garnet is exported; it is believed that a considerable part of the exports in the export class designated "emery, natural corundum, and other natural abrasives, not elsewhere classified, crude, crushed or ground" are accounted for by crushed and refined abrasive garnet. Statistics for this basket category are given in table 6.

Table 1.--Certain natural abrasives, processed: U.S. production, 1962-67

Year	Tripoli and rottenstone	Garnet	Emery
	Quantity (1,000 short tons)		
1962	53	14	4
1963	55	15	7
1964	58	16	9
1965	65	19	11
1966	61	22	11
1967	61	20	1/
	Value (1,000 dollars)		
1962	2,045	1,172	71
1963	2,118	1,412	119
1964	2,295	1,622	172
1965	2,463	1,717	204
1966	2,298	2,092	210
1967	2,413	1,849	1/

1/ Not available.

Source: Compiled from official statistics of the U.S. Bureau of Mines.

Note.--All U.S. production of these materials, whether or not sold for abrasive use, is shown in this table. Of the total domestic output of the respective materials, the share of each used for abrasive purposes was approximately as follows: Tripoli and rottenstone, 75 percent; garnet, 100 percent; and emery, 50 percent.

Table 2.--Natural and artificial abrasives, crude: U.S. imports for consumption, 1962-68

Year	Natural abrasives		Artificial abrasives		
	Corundum	Other 1/	Silicon carbide	Aluminum oxide	Other
	Quantity (1,000 short tons)				
1962	2	23	58	150	2/
1963	2	16	68	135	1
1964	2	19	80	136	3
1965	2	18	90	153	4
1966	3	39	103	183	5
1967	2	16	89	151	6
1968	6	32	106	149	4
	Value (1,000 dollars)				
1962	57	301	7,762	15,452	3/
1963	51	400	8,434	13,473	165
1964	53	518	9,659	14,099	270
1965	47	505	11,078	16,045	397
1966	57	737	12,482	19,441	1,195
1967	53	469	10,925	16,446	566
1968	113	707	14,249	17,085	322

1/ Includes emery, flint, rottenstone, and tripoli.
2/ Less than 500 tons.
3/ Less than $500.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Artificial corundum and aluminum oxide: U.S. exports of domestic merchandise, by principal markets, 1965-68

Market	1965	1966	1967	1968
	Quantity (1,000 pounds)			
Canada	13,216	18,755	20,820	17,115
United Kingdom	4,966	2,398	3,428	3,296
Japan	1,156	1,408	1,997	1,072
Sweden	3,948	2,545	2,945	916
West Germany	1,003	1,259	1,119	1,169
France	690	1,162	1,324	946
Italy	671	1,341	1,165	698
Mexico	1,622	1,483	1,636	2,121
Australia	1,195	880	1,071	928
India	3,791	2,564	906	305
Republic of South Africa	353	548	892	1,268
All other	1,897	2,229	1,825	1,212
Total	34,508	36,572	39,128	31,046
	Value (1,000 dollars)			
Canada	1,855	1,993	2,242	2,223
United Kingdom	820	557	647	926
Japan	347	312	517	277
Sweden	638	400	470	181
West Germany	163	229	257	261
France	110	186	255	258
Italy	97	286	243	130
Mexico	202	215	202	265
Australia	188	137	167	149
India	482	306	150	50
Republic of South Africa	60	82	136	174
All other	300	419	347	1,417
Total	5,262	5,122	5,633	6,311

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Silicon carbide and other carbide abrasives, crude, and in grains, powders, and flours: U.S. exports of domestic merchandise, by principal markets, 1965-68

Market	1965	1966	1967	1968
	Quantity (1,000 pounds)			
Canada	7,777	6,541	6,446	7,553
Australia	3,157	2,366	1,505	1,530
Italy	810	722	92	134
Mexico	1,570	1,738	1,343	1,913
United Kingdom	6,267	2,622	845	4,286
West Germany	194	10	228	301
Netherlands	44	31	21	49
Brazil	109	304	278	296
Israel	10	10	15	16
Republic of South Africa	960	226	466	240
Belgium	579	341	366	186
All other	4,042	4,878	3,249	2,594
Total	25,519	19,789	14,854	19,098
	Value (1,000 dollars)			
Canada	2,215	2,237	1,867	2,149
Australia	541	410	340	374
Italy	159	257	304	173
Mexico	363	371	275	478
United Kingdom	878	408	241	466
West Germany	84	50	175	330
Netherlands	190	136	143	219
Brazil	59	117	112	98
Israel	43	57	109	145
Republic of South Africa	230	63	105	94
Belgium	97	73	105	74
All other	916	1,120	785	908
Total	5,775	5,299	4,561	5,508

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 5.--Natural and artificial abrasives, in grains, or ground, pulverized, or refined: U.S. imports for consumption, 1964-68 1/

Year	Tripoli and rottenstone	Silicon carbide	Aluminum oxide	Other 2/
	Quantity (short tons)			
1964	3/	603	3,338	99
1965	-	1,083	5,971	247
1966	-	1,601	9,614	414
1967	-	1,678	7,180	843
1968	-	1,911	8,088	561
	Value (1,000 dollars)			
1964	1	206	772	26
1965	-	347	1,158	51
1966	-	497	1,867	92
1967	-	444	1,552	174
1968	-	717	1,966	133

1/ No data on a comparable basis are available for years before 1964.
2/ Includes emery, natural corundum, flint, garnet, and artificial abrasives not named in this table.
3/ Not reported.

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 6.--Emery, natural corundum, and other natural abrasives other than pumice, not elsewhere enumerated, crude, crushed, or ground: U.S. exports of domestic merchandise, by principal markets, 1965-68

Market	1965	1966	1967	1968
	Quantity (1,000 pounds)			
Canada	3,297	7,828	4,076	6,981
United Kingdom	6,065	6,953	5,985	9,957
Japan	2,713	2,205	2,958	3,278
France	2,469	2,534	2,264	3,340
West Germany	3,745	2,736	2,483	4,323
Australia	1,531	1,514	1,629	1,932
Mexico	711	983	1,026	855
Italy	288	313	579	1,115
Republic of South Africa	730	1,294	809	813
All other	4,789	6,403	6,191	7,837
Total	26,338	32,763	28,000	40,431
	Value (1,000 dollars)			
Canada	412	502	344	451
United Kingdom	232	281	271	332
Japan	257	153	229	322
France	164	174	169	198
West Germany	185	170	159	317
Australia	97	91	117	127
Mexico	62	82	92	97
Italy	35	40	63	127
Republic of South Africa	39	42	57	48
All other	364	471	434	550
Total	1,847	2,006	1,935	2,569

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Coated abrasives	519.51

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States has long been the world's largest producer and consumer of coated abrasives. In recent years U.S. exports of coated abrasives have been declining, whereas imports have been increasing; as a result, the export-import ratio, based on value, declined from about 5:1 in 1962 to 2:1 in 1967.

Description and uses

Papers, cloths, and other materials that have been wholly or partly coated with abrasives are generally termed "coated abrasives" by producers and consumers. These may be in the form of sheets, strips, disks, belts, sleeves, or similar forms. Coated abrasives are made by gluing sized natural or artificial abrasive grains to paper, cloth, or other flexible backing material. The abrasive grains used are primarily aluminum oxide, silicon carbide, garnet, emery, flint, and quartz sand. The adhesive agent is usually either hide glue combined with synthetic resin, or modified glue and resins.

Coated abrasives encompass products of widely differing types, qualities, and unit values. Improvements in coated abrasives for use in sanding machines, together with innovations in these machines and their operation, have greatly increased the use of these products in the metalworking industry, which is now the major consumer of coated abrasives. Papers and cloths coated with silicon carbide or aluminum oxide are used mainly in the working of comparatively hard metals. Some nondurable goods industries are minor purchasers of coated abrasives.

The woodworking industry is the major consumer of papers and cloths coated with garnet grains or crushed quartz, which are generally called sandpaper. Sandpaper is also used in finishing such materials as leather, hard rubber, plastics, felts, and the softer metals.

U.S. tariff treatment

The column 1 (trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1969) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
519.51	Papers, cloths, and other materials, wholly or partly coated with abrasives, artificial or natural, or both, whether in the form of sheets, strips, disks, belts, sleeves, or similar forms.	6.5% ad val.	5% ad val.	3% ad val.

The tabulation above shows the column 1 rate of duty in effect prior to January 1, 1968, which had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modification resulting from a concession granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession, which amounts to a reduction of about 50 percent, is being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

U.S. consumption

Apparent annual U.S. consumption of coated abrasives increased markedly from 1963 to 1966; in the latter year, the value of consumption was more than $161 million compared with $120 million in 1963 (table 1). The value of consumption in 1967, however, was approximately $148 million, about 9 percent less than in the preceding year. Apparent annual U.S. consumption had an average value of $140 million in 1963-67, compared with $109 million in 1958-62.

About 97 percent of the U.S. consumption of coated abrasives was supplied by domestic producers in 1967. Most coated abrasives are

used principally in the industrial States, although sandpaper is used in every part of the country.

U.S. producers

Nearly 40 U.S. companies produce coated abrasives. The three largest producers account for about 65 percent of the total annual output; the 10 largest account for more than 95 percent. Producers of coated abrasives are situated principally in New York, Massachusetts, Connecticut, Michigan, Ohio, and Minnesota.

Most of the U.S. producers manufacture all of the important types of coated abrasives, and the three largest also produce abrasive wheels and other products. Medium-sized and smaller firms generally specialize in certain types of coated abrasives, determined principally by the kind of abrasive grain used in their manufacture.

U.S. production

The United States is the world's largest producer of coated abrasives. In 1966 the value of production in the United States reached a record high of more than $168 million; the comparable value for 1967 was $153 million. The value of average annual U.S. production was $149 million in 1963-1967; it had been $114 million in 1958-62.

U.S. exports

Annual U.S. exports of coated abrasives increased consistently up to 1964, when they were valued at $12.2 million. Thereafter, exports declined each year to 1967 when they were valued at $9.4 million, down 23 percent from 1964; in 1968, however, exports were 13 percent higher than in 1967. The downward trend is thought to be ascribable more to increasing self-sufficiency abroad than to a decline in foreign consumption. Exported coated abrasives are nearly all high-grade industrial products, i.e., products incorporating silicon carbide or aluminum oxide as the abrasive grain.

U.S. exports accounted for 8.7 percent of domestic production of coated abrasives in 1964, the year of record exports, whereas they accounted for 6.2 percent in 1967.

The United States exports coated abrasives to many countries, principally the highly industrialized nations. In terms of value, Canada has historically been the leading U.S. export market; in recent years, approximately 2 million dollars' worth of coated

abrasives have been exported annually to Canada (table 2). Other leading markets have been the European Economic Community countries, Japan, the United Kingdom, the Republic of South Africa, Australia, Sweden, and Venezuela.

U.S. imports

Annual U.S. imports of coated abrasives have generally been increasing for many years, and this trend has accelerated in the last 5 years; in 1968, imports were valued at $5.8 million (table 3), more than three times the value of imports in 1964. However, 1968 imports were equivalent to less than 5 percent of domestic consumption.

Some coated abrasives are imported by U.S. producers to complement their domestic production. However, most U.S. imports are commercial sales of foreign-made coated abrasives, largely emery- or garnet-coated papers, which are similar, in type and quality, to standard domestic products, with which they compete on a price basis.

In recent years about half of U.S. imports of coated abrasives have come from West Germany. Other important suppliers have been Switzerland, the United Kingdom, Canada, and Norway.

Foreign production and trade

The combined capacity of foreign nations reporting production of coated abrasives is somewhat larger than that of the United States. The principal foreign producer, West Germany, has a large coated abrasives industry which has been not only supplying most of the requirements of its domestic market, but also exporting a substantial quantity of these products. In terms of value, West Germany's annual output of coated abrasives has averaged slightly more than half that of the United States. Other foreign countries with significant production of coated abrasives have been France, Brazil, Italy, and Switzerland.

West Germany has been the leading foreign exporter of coated abrasives, and France has been second in importance. Italy is the leading foreign importer of coated abrasives; other importing countries have been France, Belgium and Luxembourg, and the Netherlands.

Table 1.--Coated abrasives: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

Year	Production	Imports	Exports	Apparent consumption	Ratio of imports to consumption
	1,000 dollars	1,000 dollars	1,000 dollars	1,000 dollars	Percent
1962	126,579	1,576	8,711	119,444	1.3
1963	128,300	1,526	10,062	119,764	1.3
1964	140,500	1,789	12,220	130,069	1.4
1965	153,100	2,656	12,218	143,538	1.9
1966	168,500	4,159	11,273	161,386	2.6
1967	152,700	4,292	9,428	147,564	2.9
1968	1/	5,764	10,692	1/	1/

1/ Not available.

Source: Production supplied by Coated Abrasives Manufacturers' Institute and the Business and Defense Services Administration of the U.S. Department of Commerce; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Coated abrasives: U.S. exports of domestic merchandise, by principal markets, 1965-68

(In thousands of dollars)

Market	1965	1966	1967	1968
Canada	2,206	2,110	1,920	2,896
Italy	978	830	777	684
West Germany	962	830	536	559
France	670	712	478	431
Belgium and Luxembourg	571	605	475	437
Japan	904	584	445	432
United Kingdom	700	543	428	572
Sweden	601	571	428	420
Venezuela	579	480	399	453
Republic of South Africa	677	490	386	369
Australia	570	279	386	298
Switzerland	359	398	349	353
Netherlands	327	352	296	213
Philippines	211	209	228	333
All other	1,903	2,280	1,897	2,242
Total	12,218	11,273	9,428	10,692

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Coated abrasives: U.S. imports for consumption, by principal sources, 1964-68

(In thousands of dollars)

Source	1964	1965	1966	1967	1968
West Germany	1,077	1,369	2,001	2,092	2,308
Switzerland	161	470	916	601	848
United Kingdom	32	133	171	375	539
Canada	132	173	495	341	594
Norway	224	243	222	252	257
Italy	3	19	59	252	318
Austria	38	41	89	139	119
France	4	11	61	107	383
Japan	51	82	71	99	108
All other	67	115	74	34	290
Total	1,789	2,656	4,159	4,292	5,764

Source: Compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Abrasive wheel, bonded	519.83, -.84, -.86
Other abrasive articles, not elsewhere enumerated	519.91, -.95, -.97

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1969).

U.S. trade position

The United States is the world's largest producer and consumer of the abrasive wheels and other abrasive articles dealt with in this summary. U.S. exports of these commodities have been small relative to total output; the value of U.S. exports, however, has been about 10 times that of U.S. imports in recent years.

Description and uses

Regardless of the nature of the abrasive grain and the type of binder used, bonded abrasive products are produced by molding or otherwise forming into the desired shapes a mixture of grain and binder, and then vitrifying or curing the binder so that the abrasive particles will be held fast in the hardened binder. Most such products are wheel shaped, but hones, whetstones, and other abrasive articles included in this summary are made in rectangular and other shapes for hand or machine use. The term "wheels" embraces rotary cutters, disks, and other circular bodies designed to rotate on a central axis. The articles included in this summary are used for grinding, sharpening, smoothing, polishing, trueing, cutting, or similar purposes.

Diamond grinding wheels (item 519.83) are formed mainly from natural or synthetic industrial diamond grit, dust, or powder and a satisfactory bond, such as metal, plastic, or vitrified ceramic. Diamond grinding wheels are used for shaping, polishing, and lapping glass, porcelain, cemented carbides, and other hard materials.

Grinding wheels bonded with synthetic resins (item 519.84) are formed mainly from a resin having the required properties and either silicon carbide or aluminum oxide as the abrasive grain. Resin-bonded grinding wheels are used for polishing and shaping metals and other materials.

The grinding wheels formed from abrasive grain materials other than diamond and bonded with materials other than synthetic resins

(item 519.86) consist of natural or artificial abrasive grain in a bond of vitrified ceramic, sodium silicate, hard rubber, or shellac. Such grinding wheels find wide use in heavy industries, small shops, and tools for home use.

Other abrasive articles of emery or garnet (item 519.81) or of natural corundum or artificial abrasive materials, not specially provided for (item 519.95), consist of sharpening, rubbing, and grinding stones. Articles provided for under item 519.97 consist of sharpening or grinding stones and other shapes, composed of any abrasive grain other than emery, garnet, pumice, natural corundum, and artificial abrasives. These articles are used mainly in small shops and private households.

In determining the component material of chief value of TSUSA items 519.83, -91, -.93, or -.95, only the abrasive components thereof are to be compared.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1969) are as follows (in cents per pound and percent ad valorem):

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Second stage, effective Jan. 1, 1969	Final stage, effective Jan. 1, 1972
	Abrasive wheels, and abrasive articles, not elsewhere enumerated:			
	Abrasive wheels, not solid natural stone:			
519.83	Of diamond-------	15%	12%	7.5%
	Other:			
519.84	Bonded with synthetic resins.	21¢ + 17%	16.8¢ + 13.5%	10¢ + 8.5%
519.86	Other----------	10%	8%	5%
	Abrasive articles, not of pumice:			
519.91	Of emery or garnet.	10%	8%	5%
519.95	Of natural corundum or artificial abrasive materials.	5%	4%	2.5%
519.97	Other----------	15%	12%	7.5%

The tabulation above shows the column 1 rates of duty in effect prior to January 1, 1968; these rates had remained unchanged under the TSUS from August 31, 1963, through 1967. Also shown are the second and final stages of the annual rate modifications resulting from concessions granted by the United States in the Kennedy Round of trade negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions, which amount to reductions of about 50 percent, are being put into effect in five annual stages (see pertinent sections of the TSUSA-1969, reproduced in appendix A, for the staged rates).

The 1968 compound rate of 18.9 cents per pound plus 15 percent ad valorem on abrasive wheels bonded with synthetic resins (item 519.84) was equivalent to about 34 percent ad valorem, based on total imports under this item in 1968.

U.S. consumption

The value of U.S. consumption of abrasive wheels reached $272 million in 1966, then declined to $260 million in 1967 (table 1), of which an estimated 10 to 15 percent was accounted for by diamond wheels. Based on value, less than 0.5 percent of U.S. consumption is supplied by imports. About 50 percent of the consumption of grinding wheels is accounted for by the industrialized States of Michigan, Pennsylvania, Ohio, Illinois, and New York.

The value of consumption of the numerous types of abrasive articles covered here is unknown, but is believed to exceed $3 million a year. In the aggregate, probably more than 90 percent of the domestic consumption of these abrasive articles is produced domestically. Such articles are widely used in all States in small shops and homes.

U.S. producers

Diamond wheels are manufactured in the United States by at least six large companies and a number of small firms. These producers are situated mainly in Massachusetts, New York, and Illinois. The company accounting for the largest share of the domestic output is in Massachusetts; both this firm and the second largest producer are well diversified in the abrasive and ceramic industries. Most or all of the manufacturers of diamond wheels also produce nondiamond abrasive wheels.

Approximately 40 companies manufacture nondiamond grinding wheels; about 10 of these account for more than 80 percent of the total value of production. Virtually all manufacturers of grinding wheels produce both resin-bonded and ceramic-bonded wheels. Most of the manufacturers are situated in New York, Massachusetts, Michigan, and Pennsylvania.

It is estimated that hundreds of domestic firms produce one or more articles included under items 519.91, 519.95, and 519.97, usually along with an extensive line of other merchandise.

U.S. production

The United States is the world's largest producer (accounting

for about 60 percent of world output) and consumer of abrasive wheels and other abrasive articles included here.

The value of U.S. production (sales) of abrasive wheels increased steadily from about $206 million in 1962 to $282 million in 1966, but declined about 5 percent in 1967, to $268 million. Precise data are not publicly available on the domestic production of diamond grinding wheels, but is is believed that the value of annual production of such wheels has ranged between $30 million and $35 million in recent years.

Annual U.S. production of abrasive articles, not elsewhere enumerated in the TSUSA, is estimated to total more--possibly considerably more--than $3 million.

U.S. exports

U.S. exports of abrasive wheels, which approximately doubled in the decade 1957-66, were valued at $10 million in 1966 (table 1). The value of exports of such wheels, although constituting less than 5 percent of the value of domestic production, has been 10 times the value of imports in recent years.

About one-third of the total value of exports of abrasive wheels is accounted for by diamond wheels. Both diamond and nondiamond wheels are exported, and the same countries are generally the largest markets for both types (table 2 and 3). Canada has long been the major outlet, followed by several European countries and Mexico. Since the manufacture of abrasive wheels in Mexico began a few years ago, that country has declined in importance as a market for the U.S. products.

U.S. exports of other abrasive articles are not separarely reported. Although small, such exports probably far exceed U.S. imports of these articles.

U.S. imports

The value of U.S. imports of abrasive wheels and that of abrasive articles, not specially provided for, increased moderately from 1964 to 1968. In that period, the value of imports of diamond wheels more than doubled, while that of imports of articles of natural corundum or of artificial abrasives quintupled (table 4); imports in the other categories were irregular but generally trended upward. Nevertheless, imports of diamond wheels were equivalent to less than 0.5 percent of domestic production; the comparable ratio for abrasive articles, not specially provided for, is believed to be less than

10 percent, and possibly less than 5 percent.

U.S. imports of diamond wheels came mainly from Switzerland, and those of nondiamond wheels, from West Germany and other European countries, as well as from Japan and Canada. Imports of emery and garnet articles are mostly from West Germany and Japan; those of articles of natural corundum or artificial abrasives, from France, West Germany, and Japan; and those of other abrasive articles considered here, from the United Kingdom and Japan.

Manufacturers of abrasive wheels in Japan, Italy, and other countries have offered their products on the U.S. market at prices substantially lower than those of domestically produced wheels. However, most industrial consumers in the United States prefer the domestic wheels because of their generally better quality and performance--factors which usually outweigh the price differential. In addition, grinding wheels are made by domestic producers to meet innumerable specifications for size, shape, grain, bond, and other requirements, while the imported wheels are generally made only in the more common sizes and shapes. Furthermore, domestic manufacturers of grinding wheels can deliver the products required by industry on much shorter notice than can the foreign producers, which do not have comparable distribution facilities in the United States. The imported products have generally been sold to individuals and small firms via mail-order houses and retail stores rather than to large-scale industrial users.

Foreign production and trade

Production of grinding wheels and other abrasive articles has increased in recent years in the majority of foreign countries manufacturing these commodities, reflecting the expansion of metalworking and related industries in these countries and the development of new uses for abrasive products. It has been estimated that the combined productive capacity of all foreign producers of these commodities is approximately equivalent to that of the United States. U.S. companies own or control a sizable share of the foreign capacity for the production of these abrasive products.

The chief foreign producers of grinding wheels and other abrasive articles have been West Germany, the United Kingdom, Japan, and France. West Germany has been the leading foreign exporter of these commodities. Other important exporting nations include the United Kingdom, Austria, Belgium, Switzerland, France, and Italy. Among the importing nations have been West Germany, Sweden, Italy, Switzerland, France, the Netherlands, Belgium, and Canada.

Table 1.--Abrasive wheels: U.S. production (sales), imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-68

(In millions of dollars)

Year	Production	Imports	Exports	Apparent consumption
1962	205.5	1/	6.4	1/
1963	207.9	1/	6.7	1/
1964	231.4	0.7	7.2	224.9
1965	253.2	.7	9.5	244.4
1966	281.6	.8	10.1	272.3
1967	268.3	1.0	9.3	260.0
1968	1/	1.1	10.4	1/

1/ Not available.

Source: Production (sales) from Grinding Wheel Institute of America and the Business and Defense Services Administration of the U.S. Department of Commerce; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Table 2.--Diamond grinding and polishing wheels: U.S. exports of domestic merchandise, by principal markets, 1965-68

Market	1965	1966	1967	1968
	Quantity (1,000 carats)			
Canada	74	79	90	157
West Germany	59	75	58	105
Sweden	67	78	75	73
Mexico	26	29	27	37
Italy	16	11	28	39
Japan	13	16	17	19
Belgium and Luxembourg	15	34	19	22
France	14	20	15	16
All other	99	94	100	126
Total	383	436	429	594
	Value (1,000 dollars)			
Canada	760	875	769	870
West Germany	427	410	314	382
Sweden	377	397	357	287
Mexico	198	239	202	207
Italy	123	111	165	192
Japan	115	119	139	127
Belgium and Luxembourg	98	188	100	94
France	140	204	128	92
All other	815	788	772	759
Total	3,053	3,331	2,946	3,010

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 3.--Grinding and polishing wheels, except diamond wheels: U.S. exports of domestic merchandise, by principal markets, 1965-68

Market	1965	1966	1967	1968
	Quantity (1,000 pounds)			
Canada	952	883	795	1,640
Italy	492	573	700	921
West Germany	223	175	124	266
France	202	206	172	220
Sweden	734	696	189	300
United Kingdom	86	162	133	125
Mexico	146	155	121	134
Belgium and Luxembourg	161	160	79	86
All other	1,332	1,381	1,315	1,439
Total	4,328	4,391	3,628	5,131
	Value (1,000 dollars)			
Canada	1,789	1,777	1,744	2,199
Italy	437	473	549	733
West Germany	479	535	354	623
France	397	411	394	377
Sweden	447	485	273	339
United Kingdom	249	277	271	259
Mexico	226	218	201	220
Belgium and Luxembourg	267	278	165	177
All other	2,147	2,364	2,382	2,477
Total	6,438	6,818	6,333	7,404

Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4.--Abrasive wheels and other abrasive articles, not elsewhere enumerated: U.S. imports for consumption, 1964-68

(In thousands of dollars)

Item	1964	1965	1966	1967	1968
Wheels:					
Diamond	106	188	213	242	308
Other:					
Bonded with synthetic resins	190	149	138	220	262
Other	362	344	423	532	527
Articles, not elsewhere enumerated:					
Of emery or garnet	10	21	17	7	26
Of natural corundum or of artificial abrasive materials	38	82	101	211	176
Other (except of pumice)	66	40	49	65	47

Source: Compiled from official statistics of the U.S. Department of Commerce.

A P P E N D I X A

Tariff Schedules of the United States Annotated (1969): General headnotes and rules of interpretation, and excerpts relating to the items included in this volume.

NOTE: The shaded areas in this appendix cover headnotes and TSUS items not included in the summaries in this volume.

GENERAL HEADNOTES AND RULES OF INTERPRETATION

1. Tariff Treatment of Imported Articles. All articles imported into the customs territory of the United States from outside thereof are subject to duty or exempt therefrom as prescribed in general headnote 3.

2. Customs Territory of the United States. The term "customs territory of the United States", as used in the schedules, includes only the States, the District of Columbia, and Puerto Rico.

3. Rates of Duty. The rates of duty in the "Rates of Duty" columns numbered 1 and 2 of the schedules apply to articles imported into the customs territory of the United States as hereinafter provided in this headnote:

(a) Products of Insular Possessions.

(i) Except as provided in headnote 6 of schedule 7, part 2, subpart E, [and] except as provided in headnote 4 of schedule 7, part 7, subpart A, articles imported from insular possessions of the United States which are outside the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules, except that all such articles the growth or product of any such possession, or manufactured or produced in any such possession from materials the growth, product, or manufacture of any such possession or of the customs territory of the United States, or of both, which do not contain foreign materials to the value of more than 50 percent of their total value, coming to the customs territory of the United States directly from any such possession, and all articles previously imported into the customs territory of the United States with payment of all applicable duties and taxes imposed upon or by reason of importation which were shipped from the United States, without remission, refund, or drawback of such duties or taxes, directly to the possession from which they are being returned by direct shipment, are exempt from duty.

(ii) In determining whether an article produced or manufactured in any such insular possession contains foreign materials to the value of more than 50 percent, no material shall be considered foreign which, at the time such article is entered, may be imported into the customs territory from a foreign country, other than Cuba or the Philippine Republic, and entered free of duty.

(b) Products of Cuba. Products of Cuba imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. Preferential rates of duty for such products apply only as shown in the said column 1. 1/

(c) Products of the Philippine Republic.

(i) Products of the Philippine Republic imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty which are set forth in column numbered 1 of the schedules or to fractional parts of the rates in the said column 1, as hereinafter prescribed in subdivisions (c)(ii) and (c)(iii) of this headnote.

(ii) Except as otherwise prescribed in the schedules, a Philippine article, as defined in subdivision (c)(iv) of this headnote, imported into the customs territory of the United States and entered on or before July 3, 1974, is subject to that rate which results from the application of the following percentages to the most favorable rate of duty (i.e., including a preferential rate prescribed for any product of Cuba) set forth in column numbered 1 of the schedules:

(A) 20 percent, during calendar years 1963 through 1964,

(B) 40 percent, during calendar years 1965 through 1967,

(C) 60 percent, during calendar years 1968 through 1970,

(D) 80 percent, during calendar years 1971 through 1973,

(E) 100 percent, during the period from January 1, 1974, through July 3, 1974.

(iii) Except as otherwise prescribed in the schedules, products of the Philippine Republic, other than Philippine articles, are subject to the rates of duty (except any preferential rates prescribed for products of Cuba) set forth in column numbered 1 of the schedules.

(iv) The term "Philippine article", as used in the schedules, means an article which is the product of the Philippines, but does not include any article produced with the use of materials imported into the Philippines which are products of any foreign country (except materials produced within the customs territory of the United States) if the aggregate value of such imported materials when landed at the Philippine port of entry, exclusive of any landing cost and Philippine duty, was more than 20 percent of the appraised customs value of the article imported into the customs territory of the United States.

(d) Products of Canada.

(i) Products of Canada imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. The rates of duty for a Canadian article, as defined in subdivision (d)(ii) of this headnote, apply only as shown in the said column numbered 1.

(ii) The term "Canadian article", as used in the schedules, means an article which is the product of Canada, but does not include any article produced with the use of materials imported into Canada which are products of any foreign country (except materials produced within the customs territory of the United States), if the aggregate value of such imported materials when landed at the Canadian port of entry (that is, the actual purchase price, or if not purchased, the export value, of such materials, plus, if not included therein, the cost of transporting such materials to Canada but exclusive of any landing cost and Canadian duty) was --

(A) with regard to any motor vehicle or automobile truck tractor entered on or before December 31, 1967, more than 60 percent of the appraised value of the article imported into the customs territory of the United States; and

(B) with regard to any other article (including any motor vehicle or automobile truck tractor entered after December 31, 1967), more than 50 percent of the appraised value of the article imported into the customs territory of the United States.

(e) Products of Communist Countries. Notwithstanding any of the foregoing provisions of this headnote, the rates of duty shown in column numbered 2 shall apply to products, whether imported directly or indirectly, of the following countries and areas pursuant to section 401 of the Tariff Classification Act of 1962, to section 231 or 257(e) (2) of the Trade Expansion Act of 1962, or to

1/ By virtue of section 401 of the Tariff Classification Act of 1962, the application to products of Cuba of either a preferential or other reduced rate of duty in column 1 is suspended. See general headnote 3(e), infra. The provisions for preferential Cuban rates continue to be reflected in the schedules because, under section 401, the rates therefor in column 1 still form the bases for determining the rates of duty applicable to certain products, including "Philippine articles".

action taken by the President thereunder:
Albania
Bulgaria
China (any part of which may be under Communist domination or control)
Cuba 1/
Czechoslovakia
Estonia
Germany (the Soviet zone and the Soviet sector of Berlin)
Hungary
Indochina (any part of Cambodia, Laos, or Vietnam which may be under Communist domination or control)
Korea (any part of which may be under Communist domination or control)
Kurile Islands
Latvia
Lithuania
Outer Mongolia
Rumania
Southern Sakhalin
Tanna Tuva
Tibet
Union of Soviet Socialist Republics and the area in East Prussia under the provisional administration of the Union of Soviet Socialist Republics.

(f) Products of All Other Countries. Products of all countries not previously mentioned in this headnote imported into the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules.

(g) Effective Date; Exceptions - Staged Rates of Duty. 2/ Except as specified below or as may be specified elsewhere, pursuant to section 501(a) of the Tariff Classification Act of 1962 (P.L. 87-456, approved May 24, 1962), the rates of duty in columns numbered 1 and 2 become effective with respect to articles entered on or after the 10th day following the date of the President's proclamation provided for in section 102 of the said Act. If, in column numbered 1, any rate of duty or part thereof is set forth in parenthesis, the effective date shall be governed as follows:

(i) If the rate in column numbered 1 has only one part (i.e., 8¢ (10¢) per lb.), the parenthetical rate (viz., 10¢ per lb.) shall be effective as to articles entered before July 1, 1964, and the other rate (viz., 8¢ per lb.) shall be effective as to articles entered on or after July 1, 1964.

(ii) If the rate in column numbered 1 has two or more parts (i.e., 5¢ per lb. + 50% ad val.) and has a parenthetical rate for either or both parts, each part of the rate shall be governed as if it were a one-part rate. For example, if a rate is expressed as "4¢ (4.5¢) per lb. + 8% (9%) ad val.", the rate applicable to articles entered before July 1, 1964, would be "4.5¢ per lb. + 9% ad val."; the rate applicable to articles entered on or after July 1, 1964, would be "4¢ per lb. + 8% ad val.".

(iii) If the rate in column numbered 1 is marked with an asterisk (*), the foregoing provisions of (i) and (ii) shall apply except that "January 1, 1964" shall be substituted for "July 1, 1964", wherever this latter date appears.

1/ In Proclamation 3447, dated February 3, 1962, the President, acting under authority of section 620(a) of the Foreign Assistance Act of 1961 (75 Stat. 445), as amended, prohibited the importation into the United States of all goods of Cuban origin and all goods imported from or through Cuba, subject to such exceptions as the Secretary of the Treasury determines to be consistent with the effective operation of the embargo.

2/ The purpose of headnote 3(g) was to provide for an effective date for the rates of duty initially contained in the Tariff Schedules of the United States. By Presidential Proclamation 3548 of August 21, 1963, these rates of duty, except as noted in subparagraphs (i), (ii), and (iii) of headnote 3(g), became effective on August 31, 1963.

4. Modification or Amendment of Rates of Duty. Except as otherwise provided in the Appendix to the Tariff Schedules --

(a) a statutory rate of duty supersedes and terminates the existing rates of duty in both column numbered 1 and column numbered 2 unless otherwise specified in the amending statute;

(b) a rate of duty proclaimed pursuant to a concession granted in a trade agreement shall be reflected in column numbered 1 and, if higher than the then existing rate in column numbered 2, also in the latter column, and shall supersede but not terminate the then existing rate (or rates) in such column (or columns);

(c) a rate of duty proclaimed pursuant to section 336 of the Tariff Act of 1930 shall be reflected in both column numbered 1 and column numbered 2 and shall supersede but not terminate the then existing rates in such columns; and

(d) whenever a proclaimed rate is terminated or suspended, the rate shall revert, unless otherwise provided, to the next intervening proclaimed rate previously superseded but not terminated or, if none, to the statutory rate.

5. Intangibles. For the purposes of headnote 1 --
(a) corpses, together with their coffins and accompanying flowers,
(b) currency (metal or paper) in current circulation in any country and imported for monetary purposes,
(c) electricity,
(d) securities and similar evidences of value, and
(e) vessels which are not "yachts or pleasure boats" within the purview of subpart D, part 6, of schedule 6,
are not articles subject to the provisions of these schedules.

6. Containers or Holders for Imported Merchandise. For the purposes of the tariff schedules, containers or holders are subject to tariff treatment as follows:

(a) Imported Empty: Containers or holders if imported empty are subject to tariff treatment as imported articles and as such are subject to duty unless they are within the purview of a provision which specifically exempts them from duty.

(b) Not Imported Empty: Containers or holders if imported containing or holding articles are subject to tariff treatment as follows:

(i) The usual or ordinary types of shipping or transportation containers or holders, if not designed for, or capable of, reuse, and containers of usual types ordinarily sold at retail with their contents, are not subject to treatment as imported articles. Their cost, however, is, under section 402 or section 402a of the tariff act, a part of the value of their contents and if their contents are subject to an ad valorem rate of duty such containers or holders are, in effect, dutiable at the same rate as their contents, except that their cost is deductible from dutiable value upon submission of satisfactory proof that they are products of the United States which are being returned without having been advanced in value or improved in condition by any means while abroad.

(ii) The usual or ordinary types of shipping or transportation containers or holders, if designed for, or capable of, reuse, are subject to treatment as imported articles separate and distinct from their contents. Such holders or containers are not part of the dutiable value of their contents and are separately subject to duty upon each and every importation into the customs territory of the United States unless within the scope of a provision specifically exempting them from duty.

(iii) In the absence of context which requires otherwise, all other containers or holders are subject to the same treatment as specified in (ii) above for usual or ordinary types of shipping or transportation containers or holders designed for, or capable of, reuse.

7. Commingling of Articles. (a) Whenever articles subject to different rates of duty are so packed together or mingled that the quantity or value of each class of articles cannot be readily ascertained by customs officers (without physical segregation of the shipment or the contents of any entire package thereof), by one or more of the following means:

(i) sampling,

(ii) verification of packing lists or other documents filed at the time of entry, or

(iii) evidence showing performance of commercial settlement tests generally accepted in the trade and filed in such time and manner as may be prescribed by regulations of the Secretary of the Treasury,

the commingled articles shall be subject to the highest rate of duty applicable to any part thereof unless the consignee or his agent segregates the articles pursuant to subdivision (b) hereof.

(b) Every segregation of articles made pursuant to this headnote shall be accomplished by the consignee or his agent at the risk and expense of the consignee within 30 days (unless the Secretary authorizes in writing a longer time) after the date of personal delivery or mailing, by such employee as the Secretary of the Treasury shall designate, of written notice to the consignee that the articles are commingled and that the quantity or value of each class of articles cannot be readily ascertained by customs officers. Every such segregation shall be accomplished under customs supervision, and the compensation and expenses of the supervising customs officers shall be reimbursed to the Government by the consignee under such regulations as the Secretary of the Treasury may prescribe.

(c) The foregoing provisions of this headnote do not apply with respect to any part of a shipment if the consignee or his agent furnishes, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(i) that such part (A) is commercially negligible, (B) is not capable of segregation without excessive cost, and (C) will not be segregated prior to its use in a manufacturing process or otherwise, and

(ii) that the commingling was not intended to avoid the payment of lawful duties.

Any article with respect to which such proof is furnished shall be considered for all customs purposes as a part of the article, subject to the next lower rate of duty, with which it is commingled.

(d) The foregoing provisions of this headnote do not apply with respect to any shipment if the consignee or his agent shall furnish, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(i) that the value of the commingled articles is less than the aggregate value would be if the shipment were segregated;

(ii) that the shipment is not capable of segregation without excessive cost and will not be segregated prior to its use in a manufacturing process or otherwise; and

(iii) that the commingling was not intended to avoid the payment of lawful duties.

Any merchandise with respect to which such proof is furnished shall be considered for all customs purposes to be dutiable at the rate applicable to the material present in greater quantity than any other material.

(e) The provisions of this headnote shall apply only in cases where the schedules do not expressly provide a particular tariff treatment for commingled articles.

8. Abbreviations. In the schedules the following symbols and abbreviations are used with the meanings respectively indicated below:

$	-	dollars
¢	-	cents
%	-	percent
+	-	plus
ad val.	-	ad valorem
bu.	-	bushel
cu.	-	cubic
doz.	-	dozen
ft.	-	feet
gal.	-	gallon
in.	-	inches
lb.	-	pounds
oz.	-	ounces
sq.	-	square
wt.	-	weight
yd.	-	yard
pcs.	-	pieces
prs.	-	pairs
lin.	-	linear
I.R.C.	-	Internal Revenue Code

9. Definitions. For the purposes of the schedules, unless the context otherwise requires --

(a) the term "entered" means entered, or withdrawn from warehouse, for consumption in the customs territory of the United States;

(b) the term "entered for consumption" does not include withdrawals from warehouse for consumption;

(c) the term "withdrawn for consumption" means withdrawn from warehouse for consumption and does not include articles entered for consumption;

(d) the term "rate of duty" includes a free rate of duty; rates of duty proclaimed by the President shall be referred to as "proclaimed" rates of duty; rates of duty enacted by the Congress shall be referred to as "statutory" rates of duty; and the rates of duty in column numbered 2 at the time the schedules become effective shall be referred to as "original statutory" rates of duty;

(e) the term "ton" means 2,240 pounds, and the term "short ton" means 2,000 pounds;

(f) the terms "of", "wholly of", "almost wholly of", "in part of" and "containing", when used between the description of an article and a material (e.g., "furniture of wood", "woven fabrics, wholly of cotton", etc.), have the following meanings:

(i) "of" means that the article is wholly or in chief value of the named material;

(ii) "wholly of" means that the article is, except for negligible or insignificant quantities of some other material or materials, composed completely of the named material;

(iii) "almost wholly of" means that the essential character of the article is imparted by the named material, notwithstanding the fact that significant quantities of some other material or materials may be present; and

(iv) "in part of" or "containing" mean that the article contains a significant quantity of the named material.

With regard to the application of the quantitative concepts specified in subparagraphs (ii) and (iv) above, it is intended that the de minimis rule apply.

10. General Interpretative Rules. For the purposes of these schedules --

(a) the general, schedule, part, and subpart headnotes, and the provisions describing the classes of imported articles and specifying the rates of duty or other import restrictions to be imposed thereon are subject to the rules of interpretation set forth herein and to such other rules of statutory interpretation, not inconsistent therewith, as have been or may be developed under administrative or judicial rulings;

(b) the titles of the various schedules, parts, and subparts and the footnotes therein are intended for convenience in reference only and have no legal or interpretative significance;

(c) an imported article which is described in two or more provisions of the schedules is classifiable in the provision which most specifically describes it; but, in applying this rule of interpretation, the following considerations shall govern:

(i) a superior heading cannot be enlarged by inferior headings indented under it but can be limited thereby;

(ii) comparisons are to be made only between provisions of coordinate or equal status, i.e., between the primary or main superior headings of the schedules or between coordinate inferior headings which are subordinate to the same superior heading;

(d) if two or more tariff descriptions are equally applicable to an article, such article shall be subject to duty under the description for which the original statutory rate is highest, and, should the highest original statutory rate be applicable to two or more of such descriptions, the article shall be subject to duty under that one of such descriptions which first appears in the schedules;

(e) in the absence of special language or context which otherwise requires --

(i) a tariff classification controlled by use (other than actual use) is to be determined in accordance with the use in the United States at, or immediately prior to, the date of importation, of articles of that class or kind to which the imported articles belong, and the controlling use is the chief use, i.e., the use which exceeds all other uses (if any) combined;

(ii) a tariff classification controlled by the actual use to which an imported article is put in the United States is satisfied only if such use is intended at the time of importation, the article is so used, and proof thereof is furnished within 3 years after the date the article is entered;

(f) an article is in chief value of a material if such material exceeds in value each other single component material of the article;

(g) a headnote provision which enumerates articles not included in a schedule, part, or subpart is not necessarily exhaustive, and the absence of a particular article from such headnote provision shall not be given weight in determining the relative specificity of competing provisions which describe such article;

(h) unless the context requires otherwise, a tariff description for an article covers such article, whether assembled or not assembled, and whether finished or not finished;

(ij) a provision for "parts" of an article covers a product solely or chiefly used as a part of such article, but does not prevail over a specific provision for such part.

11. Issuance of Rules and Regulations. The Secretary of the Treasury is hereby authorized to issue rules and regulations governing the admission of articles under the provisions of the schedules. The allowance of an importer's claim for classification, under any of the provisions of the schedules which provide for total or partial relief from duty or other import restrictions on the basis of facts which are not determinable from an examination of the article itself in its condition as imported, is dependent upon his complying with any rules or regulations which may be issued pursuant to this headnote.

12. The Secretary of the Treasury is authorized to prescribe methods of analyzing, testing, sampling, weighing, gauging, measuring, or other methods of ascertainment whenever he finds that such methods are necessary to determine the physical, chemical, or other properties or characteristics of articles for purposes of any law administered by the Customs Service.

General statistical headnotes:

1. Statistical Requirements for Imported Articles. Persons making customs entry or withdrawal of articles imported into the customs territory of the United States shall complete the entry or withdrawal forms, as provided herein and in regulations issued pursuant to law, to provide for statistical purposes information as follows:

(a) the number of the Customs district and of the port where the articles are being entered for consumption or warehouse, as shown in Statistical Annex A of these schedules;

(b) the name of the carrier or the means of transportation by which the articles were transported to the first port of unloading in the United States;

(c) the foreign port of lading;

(d) the United States port of unlading;

(e) the date of importation;

(f) the country of origin of the articles expressed in terms of the designation therefor in Statistical Annex B of these schedules;

(g) a description of the articles in sufficient detail to permit the classification thereof under the proper statistical reporting number in these schedules;

(h) the statistical reporting number under which the articles are classifiable;

(ij) gross weight in pounds for the articles covered by each reporting number when imported in vessels or aircraft;

(k) the net quantity in the units specified herein for the classification involved;

(l) the U.S. dollar value in accordance with the definition in Section 402 or 402a of the Tariff Act of 1930, as amended, for all merchandise including that free of duty or dutiable at specific rates; and

(m) such other information with respect to the imported articles as is provided for elsewhere in these schedules.

2. Statistical Annotations. (a) The statistical annotations to the Tariff Schedules of the United States consist of --

(i) the 2-digit statistical suffixes,
(ii) the indicated units of quantity,
(iii) the statistical headnotes and annexes, and
(iv) the italicized article descriptions.

(b) The legal text of the Tariff Schedules of the United States consists of the remaining text as more specifically identified in headnote 10(a) of the general headnotes and rules of interpretation.

(c) The statistical annotations are subordinate to the provisions of the legal text and cannot change their scope.

3. Statistical Reporting Number. (a) General Rule: Except as provided in paragraph (b) of this headnote, and in the absence of specific instructions to the contrary elsewhere, the statistical reporting number for an article consists of the 7-digit number formed by combining the 5-digit item number with the appropriate 2-digit statistical suffix. Thus, the statistical reporting number for live monkeys dutiable under item 100.95 is "100.9520".

(b) Wherever in the tariff schedules an article is classifiable under a provision which derives its rate of duty from a different provision, the statistical reporting number is, in the absence of specific instructions to the contrary elsewhere, the 7-digit number for the basic provision followed by the item number of the provision from which the rate is derived. Thus, the statistical reporting number of mixed apple and grape juices, not containing over 1.0 percent of ethyl alcohol by volume, is "165.6500-165.40".

4. Abbreviations. (a) The following symbols and abbreviations are used with the meanings respectively indicated below:

s. ton	-	short ton
C.	-	one hundred
Cwt.	-	100 lbs.
mg.	-	milligram
M.	-	1,000
bd. ft.	-	board feet
M. bd. ft.	-	1,000 board feet
mc.	-	millicurie
cord	-	128 cubic feet
square	-	amount to cover 100 square feet of surface
sup. ft.	-	superficial foot
oz.	-	ounces avoirdupois
fl. oz.	-	fluid ounce
oz. troy	-	troy ounce
pf. gal.	-	proof gallon

(b) An "X" appearing in the column for units of quantity means that no quantity (other than gross weight) is to be reported.

(c) Whenever two separate units of quantity are shown for the same article, the "v" following one of such units means that the value of the article is to be reported with that quantity.

Amendments and Modifications

PROVISIONS	
Gen Hdnte 3(a)(i)	Language "Except as provided in headnote 6 of schedule 7, part 2, subpart E," added; language "except that all articles" deleted and language "except that all such articles" inserted in lieu thereof. Pub. L. 89-805, Secs. 1(a), (c), Nov. 10, 1966, 80 Stat. 1521, 1522, effective date Jan. 1, 1967.
	Language "Except as provided in headnote 4 of schedule 7, part 7, subpart A," added. Pub. L. 89-806, Secs. 2(b), (c), Nov. 10, 1966, 80 Stat. 1523, effective date March 11, 1967.

PROVISIONS	
Gen Hdnte 3(d), (e), (f) and (g)	Headnotes 3(d), (e), and (f) redesignated as headnotes 3(e), (f), and (g), respectively, and new headnote 3(d) added. Pub. L. 89-283, Secs. 401(a), 403, Oct. 21, 1965, 79 Stat. 1021, 1022; entered into force Oct. 22, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68.
Gen Hdnte 6(b)(i)	Language "and containers of usual types ordinarily sold at retail with their contents," added. Pub. L. 89-241, Secs. 2(a), 4, Oct. 7, 1965, 79 Stat. 933, 934, effective date Dec. 7, 1965.

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS

Part 1 - Nonmetallic Minerals and Products, Except Ceramic Products and Glass and Glass Products
- A. Hydraulic Cement; Concrete; Concrete Products
- B. Lime, Gypsum, and Plaster Products
- C. Stone and Stone Products
- D. Mica and Mica Products
- E. Graphite and Related Products
- F. Asbestos and Asbestos Products
- G. Abrasives and Abrasive Articles
- H. Gems, Gemstones, and Articles Thereof; Industrial Diamonds
- J. Miscellaneous Nonmetallic Minerals and Products
- K. Nonmetallic Minerals and Products Not Specially Provided For

Part 2 - Ceramic Products
- A. Refractory and Heat-Insulating Articles
- B. Ceramic Construction Articles
- C. Table, Kitchen, Household, Art and Ornamental Pottery
- D. Industrial Ceramics
- E. Ceramic Articles Not Specially Provided For

Part 3 - Glass and Glass Products
- A. Glass in the Mass; Glass in Balls, Tubes, Rods, and Certain Other Forms; Foam Glass; Optical Glass; and Glass Fibers and Products Thereof
- B. Flat Glass and Products Thereof
- C. Glassware and Other Glass Products
- D. Glass Articles Not Specially Provided For

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 1. - NONMETALLIC MINERALS AND PRODUCTS, EXCEPT CERAMIC PRODUCTS AND GLASS AND GLASS PRODUCTS			
		Subpart A. - Hydraulic Cement; Concrete; Concrete Products			
		Subpart A headnote: 1. For the purposes of this subpart -- (a) the term "cement" means cementing materials without added sand, gravel, or other aggregate; and (b) the term "concrete" means a composite of cementing materials of mineral origin with added mineral aggregate such as sand, crushed stone, or gravel; and (c) the term "tiles" does not include any article 1.25 inches or more in thickness.			
		Hydraulic cement and cement clinker:			
511.11	00	White, nonstaining Portland cement	Lb.	2¢ per 100 lbs., including weight of container	8¢ per 100 lbs., including weight of container
511.14		Other		1.3¢ per 100 lbs., including weight of container	6¢ per 100 lbs. including weight of container
	20	*Cement clinker*	*Lb.*		
	40	*Other*	*Lb.*		
		Concrete mixes, whether wet or dry:			
511.21	00	Hydraulic cement concrete	Cu. yd.	3% ad val.	20% ad val.
511.25	00	Other	Cu. yd.	12% ad val.	30% ad val.
		Articles, including terrazzo, of concrete, with or without reinforcement:			
		Tiles:			
511.31	00	Floor and wall tiles	Sq. ft.	21% ad val.	55% ad val.
511.41	00	Other tiles, including roofing tiles	Sq. ft.	20.5% ad val.	55% ad val.
		Other, not specially provided for:			
511.51	00	Articles of tiles described in item 511.31	X	10% ad val.	50% ad val.
		Other:			
511.61	00	Not decorated	X	12% ad val.	30% ad val.
511.71	00	Decorated	X	21.5% ad val.	40% ad val.
		Subpart B. - Lime, Gypsum, and Plaster Products			
		Subpart B headnote: 1. This subpart does not cover gypsum or plaster building boards and lath (see part 3 of schedule 2).			
		Lime:			
512.11	00	Hydrated	Lb.	1.5¢ per 100 lbs., including weight of container	12¢ per 100 lbs., including weight of container
512.14	00	Other	Lb.	1.5¢ per 100 lbs., including weight of container	10¢ per 100 lbs., including weight of container
		Plaster rock or gypsum:			
512.21	00	Not ground and not wholly or partly calcined	S. ton.	Free	Free
512.24	00	Ground, wholly or partly calcined, or both	Ton	95¢ per ton	$1.40 per ton
		Cement of gypsum:			
512.31	00	Valued not over $40 per ton	Ton	$8 per ton	$10 per ton
512.35	00	Valued over $40 per ton	Ton	$11.20 per ton	$14 per ton

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Articles not specially provided for, of plaster of Paris, with or without reinforcement:			
512.41	00	Statues, statuettes, and bas-reliefs	X	8% ad val.	60% ad val.
512.44	00	Other	X	9.5% ad val.	35% ad val.
		Subpart C. - Stone and Stone Products			
		Subpart C headnotes:			
		1. This subpart covers stone and articles of stone, but does not include -- (i) limestone to be used in the manufacture of fertilizer (see part II of schedule 4); (ii) articles of concrete in which stone chips or particles are used as aggregate (see subpart A of this part); (iii) certain abrasives and abrasive stones (see subpart G of this part); (iv) precious and semiprecious stones (see subpart H of this part); (v) talc, soapstone, or cornwall stone (see subpart J of this part); and (vi) certain articles provided for in schedule 7.			
		2. The term "slabs" (items 514.61 and 514.65) embraces flat stone pieces, not over 2 inches in thickness, having a facial area of 4 square inches or more, whether or not cut to size and whether or not one or both surfaces have been rubbed or polished, the edges of which have not been beveled, rounded or otherwise processed except such processing as may be needed to facilitate installation as tiling or veneering in building construction.			
		Subpart C statistical headnote:			
		(1) For the purposes of this subpart the term "Superficial foot" refers to a unit of quantity designating the area of the largest face of a slab in terms of square feet.			
		Sand, crude or manufactured, and gravel:			
513.11	00	Sand containing by weight 95 percent or more of silica and not more than 0.6 percent of oxide of iron	Ton	40¢ per ton	$2 per ton
513.14	00	Other	Ton	Free	Free
		Stone chips and spalls, and stone, crushed (otherwise than merely to facilitate shipment to the United States) or ground:			
513.21	00	Marble, breccia, and onyx chips	S. ton	8% ad val.	30% ad val.
513.31	00	Slate	S. ton	8% ad val.	25% ad val.
		Limestone:			
513.35	00	Imported to be used in the manufacture of cement	S. ton	Free	$1 per short ton
513.36	00	Other	S. ton	12¢ per short ton	$1 per short ton
513.41	00	Other	S. ton	4% ad val.	50% ad val.
513.51	00	Stone statuary and sculptures not specially provided for, the professional productions of sculptors only	X	6% ad val.	20% ad val.
		Granite and articles of granite:			
513.61	00	Granite, not manufactured, and not suitable for use as monumental, paving, or building stone	Ton	Free	Free

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Granite and articles of granite (con.):			
		Granite, suitable for use as monumental, paving, or building stone:			
513.71	00	Not pitched, not lined, not pointed, not hewn, not sawed, not dressed, not polished, and not otherwise manufactured...	Cu. ft..	Free	25¢ per cu. ft.
513.74	00	Pitched, lined, pointed, hewn, sawed, dressed, polished, or otherwise manufactured.....	Cu. ft..	10% ad val.	60% ad val.
		Other, not specially provided for:			
513.81	00	Not decorated.....	X.....	12% ad val.	30% ad val.
513.84	00	Decorated.....	X.....	21.5% ad val.	40% ad val.
		Jet; and articles of alabaster, of jet, or of alabaster and jet:			
513.91	00	Jet, not manufactured.....	Lb.....	Free	Free
513.94	00	Other, not specially provided for.....	X.....	13.5% ad val.	50% ad val.
		Limestone and articles of limestone:			
514.11	00	Limestone, crude, not suitable for use as monumental, paving, or building stone.....	S. ton..	16¢ per short ton	$1 per short ton
		Limestone suitable for use as monumental, paving, or building stone:			
514.21	00	Not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.....	Cu. ft..	1¢ per cu. ft.	15¢ per cu. ft.
514.24	00	Hewn, sawed, dressed, polished, or otherwise manufactured.....	S. ton..	16.5% ad val.	50% ad val.
		Other, not specially provided for:			
514.34	00	Articles of chalk.....	X.....	8% ad val.	25% ad val.
		Other:			
514.41	00	Not decorated.....	X.....	12% ad val.	30% ad val.
514.44	00	Decorated.....	X.....	21.5% ad val.	40% ad val.
		Marble, breccia, and onyx, and articles of one or more of these substances:			
514.51	00	Marble, breccia, in block, rough or squared only.....	Cu. ft..	22¢ per cu. ft.	65¢ per cu. ft.
514.54	00	Onyx, in block, rough or squared only.....	Cu. ft..	26¢ per cu. ft.	65¢ per cu. ft.
514.57	00	Marble, breccia, or onyx, sawed or dressed, over 2 inches thick.....	Cu. ft..	40¢ per cu. ft.	$1 per cu. ft.
		Slabs:			
514.61	00	Not rubbed and not polished in whole or in part.....	Sup. ft.	4% ad val.	13% ad val.
514.65	00	Rubbed or polished in whole or in part.....	Sup. ft.	5.5% ad val.	15% ad val.
514.81	00	Other, not specially provided for.....	X.....	16.5% ad val.	50% ad val.
514.91	00	Quartzite, whether or not manufactured.....	Ton.....	Free	Free
		Slate, and articles of slate:			
515.11	00	Roofing slate.....	Sq. ft..	20% ad val.	25% ad val.
515.14	00	Other, not specially provided for.....	X.....	8% ad val.	25% ad val.
		Travertine and articles of travertine:			
515.21	00	Travertine, not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.....	Cu. ft..	8¢ per cu. ft.	25¢ per cu. ft.
515.24	00	Travertine, hewn, sawed, dressed, polished, or otherwise manufactured, and suitable for use as monumental, paving, or building stone.....	S. ton..	16.5% ad val.	50% ad val.
		Other, not specially provided for:			
515.31	00	Not decorated.....	X.....	12% ad val.	30% ad val.
515.34	00	Decorated.....	X.....	21.5% ad val.	40% ad val.
		Stone, and articles not specially provided for, of stone:			
515.41	00	Stone, not manufactured, and not suitable for use as monumental, paving, or building stone.....	Ton.....	Free	Free
		Stone suitable for use as monumental, paving, or building stone:			
515.51	00	Not hewn, not sawed, not dressed, not polished, and not otherwise manufactured.....	Cu. ft..	1¢ per cu. ft.	15¢ per cu. ft.
515.54	00	Hewn, sawed, dressed, polished, or otherwise manufactured.....	S. ton..	16.5% ad val.	50% ad val.
		Other:			
515.61	00	Not decorated.....	X.....	12% ad val.	30% ad val.
515.64	00	Decorated.....	X.....	21.5% ad val.	40% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart D. - Mica and Mica Products			
		Subpart D headnote:			
		1. For the purposes of this subpart -- (a) the term "mica" includes both natural and man-made mica; (b) the term "split block mica" (item 516.31) means mica, not exceeding 0.020 inch in thickness, that has been split and selected within a tolerance of 8 mils, but which has not been cut or stamped to dimensions, shape or form; (c) the term "mica splittings" (item 516.51) means mica laminae in book-form or book-pack, or in loose pack, suitable for use in the manufacture of built-up mica (item 516.91); and (d) the term "built-up mica" (item 516.91) means electrical insulating plates, sheets, and tapes, whether or not attached to paper, cloth, or other backing, consisting of reconstituted mica whether or not treated with resins or of layers of mica splittings and bonding material.			
		Mica not manufactured (including mica over 0.006 inch in thickness, not cut or stamped to dimensions, shape or form, and split block mica), and mica scalings, mica cleanings, and other mica waste and scrap:			
516.11	00	Untrimmed phlogopite from which no rectangular piece over 2 inches long or 1 inch wide may be cut	Lb.	4% ad val.	15% ad val.
		Waste and scrap valued not over 5 cents per pound:			
516.21	00	Phlogopite	Lb.	10% ad val.	25% ad val.
516.24	00	Other	Lb.	10% ad val.	25% ad val.
516.31	00	Split block mica	Lb.	Free	Free
516.41		Other		2¢ per lb.	4¢ per lb.
	10	*Muscovite*	*Lb.*		
	50	*Other*	*Lb.*		
516.51	00	Mica splittings	Lb.	Free	Free
516.61	00	Mica, not over 0.006 inch in thickness, not cut or stamped to dimensions, shape or form	Lb.	Free	Free
		Mica, cut or stamped to dimensions, shape, or form, whether or not perforated or indented, and whether or not dedicated to a specific use:			
516.71	00	Not over 0.006 inch in thickness	Lb.	18% ad val.	45% ad val.
		Over 0.006 inch in thickness:			
		Not perforated or indented:			
516.73	00	Fuse discs, split to thickness	Lb.	20% ad val.	40% ad val.
516.74	00	Other	Lb.	32% ad val.	40% ad val.
516.76	00	Perforated or indented	Lb.	20% ad val.	40% ad val.
516.81	00	Mica, ground or pulverized	Lb.	10% ad val.	20% ad val.
516.91	00	Built-up mica	Lb.	13.5% ad val.	40% ad val.
516.94	00	Articles not specially provided for, of mica	Lb.	20% ad val.	40% ad val.
516.98	00	Any article described in the foregoing items 516.71 to 516.76, inclusive, or 516.94, if Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free	

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart E. - Graphite and Related Products			
		Graphite, crude and refined:			
517.11	00	Artificial	Lb.	4% ad val.	10% ad val.
		Natural:			
		Crystalline flake (not including flake dust):			
517.21	00	Valued not over 5.5 cents per pound	Lb.	12% ad val.	1.65¢ per lb.
517.24	00	Valued over 5.5 cents per pound	Lb.	0.65¢ per lb.	1.65¢ per lb.
517.27	00	Crystalline lump or chip	Lb.	4% ad val.	30% ad val.
517.31	00	Other	Lb.	Free	10% ad val.
517.51	00	Calcined petroleum and coal coke, not commercially suitable for use as a fuel	S. ton	12% ad val.	45% ad val.
		Carbons and electrodes:			
517.61	00	Electrodes, in part of carbon or graphite, for electric furnace or electrolytic purposes	Lb.	10% ad val. 1/	45% ad val.
		Carbons and electrodes, for producing electric arc light:			
517.71	00	Under 0.5 inch in diameter or of equivalent cross-sectional area	No.	11% ad val.	60% ad val.
517.74	00	0.5 inch or more in diameter or of equivalent cross-sectional area	No.	9.5% ad val.	45% ad val.
517.81	00	Brushes for electric generators, motors, or other electrical machines or appliances; plates, rods, powder, and other forms, wholly or partly manufactured, for manufacturing into the aforesaid brushes	X.	8% ad val.	45% ad val.
517.82	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X.	Free	
517.91	00	Articles not specially provided for, of carbon or graphite	X.	12% ad val.	45% ad val.
		Subpart F. - Asbestos and Asbestos Products			
		Subpart F headnote:			
		1. This subpart does not include footwear, headwear, gloves, laminated or reinforced plastics, and certain other articles provided for in schedule 7.			
518.11		Asbestos, not manufactured, asbestos crudes, fibers, and stucco, and asbestos sand and refuse containing not more than 15 percent by weight of foreign matter	.....	Free	Free
	10	*Amosite*	*S. ton*		
	20	*Crocidolite (Blue)*	*S. ton*		
		Chrysotile:			
	30	*Crudes*	*S. ton*		
	40	*Spinning fibers*	*S. ton*		
	50	*Other*	*S. ton*		
	60	*Other*	*S. ton*		
518.21	00	Yarn, slivers, rovings, wick, rope, cord, cloth, tape, and tubing, of asbestos, or of asbestos and any other spinnable fiber, with or without wire, and articles of any of the foregoing	Lb.	6% ad val.	40% ad val.
		Articles in part of asbestos and hydraulic cement:			
518.41	00	Pipes and tubes and fittings therefor	Lb.	0.24¢ per lb.	0.75¢ per lb.
518.44	00	Other	Lb.	0.15¢ per lb.	1¢ per lb.
518.51	00	Articles not specially provided for, of asbestos	X.	7% ad val.	25% ad val.

1/ Duty temporarily suspended for certain electrodes. See Appendix to Tariff Schedules.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Subpart G. - Abrasives and Abrasive Articles			
		Subpart G headnotes:			
		1. This subpart covers certain crude minerals commonly used for making abrasives and abrasive articles (items 519.01 through 519.17, inclusive) but these minerals are classifiable in this subpart even if they are not of abrasive quality. This subpart also covers certain minerals and artificial abrasives in forms suitable for use as abrasives or for abrasive purposes (items 519.31 through 519.37, inclusive). The remaining provisions of this subpart apply to papers, cloths, stones, and other articles which are cut or fashioned from natural stone or made from natural or artificial abrasive materials usually with the use of glues, resins, rubber or other binding materials, and which are designed and used for grinding, sharpening, smoothing, polishing, trueing, cutting, or similar purposes. The provisions of this subpart do not cover -- (i) sand (see subpart C of this part), unless made up into abrasive articles; (ii) natural or synthetic diamond dust or powder (see subpart H of this part); (iii) crushed or powdered glass (see part 3 of this schedule), unless made up into abrasive articles; (iv) cosmetics and other toilet preparations (see part 75 of schedule 4); (v) soap and synthetic detergents (see part 83 of schedule 4); (vi) wheels or other abrasive articles mounted in frameworks or machines (see schedule 6); (vii) dental burrs (see part 2 of schedule 7); or (viii) tools to which abrasives have been applied but which have other functioning or working elements such as cutting teeth, edges, grooves, and flutes (see schedule 6). 2. For the purposes of this subpart -- (a) the term "pumice" includes both pumice and pumicite; and (b) the term "wheels" embraces rotary cutters, disks and other circular bodies designed to rotate on a central axis. 3. In determining the component material of chief value in the articles covered by item 519.83, 519.91, 519.93, or 519.95, only the abrasive components thereof shall be compared.			
519.01	00	Burrstones in blocks, rough	Ton.	Free	Free
519.05	00	Pumice stone to be used in the manufacture of concrete masonry products such as building blocks, bricks, tiles, and similar forms	S. ton.	Free	Free

Item	Stat Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Emery, natural corundum, pumice, flint, rottenstone, and tripoli, all the foregoing, crude, or crushed merely to facilitate transportation to the United States:			
		Pumice:			
519.11	00	Valued not over $15 per ton	Lb.	0.034¢ per lb	0.1¢ per lb.
519.14	00	Valued over $15 per ton	Lb.	0.06¢ per lb.	0.25¢ per lb.
519.17		Other		Free	Free
	20	*Corundum*	*S. ton*		
	40	*Other*	*S. ton*		
519.21		Crude silicon carbide and crude artificial abrasives		Free	Free
	20	*Silicon carbide*	*S. ton*		
	40	*Aluminum oxide*	*S. ton*		
	60	*Other*	*S. ton*		
		Emery, natural corundum, pumice, flint, rottenstone, tripoli, garnet, silicon carbide, and artificial abrasives, all the foregoing, in grains, or ground, pulverized, or refined:			
519.31	00	Pumice	Lb.	0.28¢ per lb.	0.75¢ per lb.
519.34	00	Rottenstone and tripoli	Ton.	Free	Free
519.37		Other		0.4¢ per lb.	1¢ per lb.
	20	*Silicon carbide*	*Lb.*		
	40	*Aluminum oxide*	*Lb.*		
	60	*Other*	*Lb.*		
519.51	00	Papers, cloths, and other materials, wholly or partly coated with abrasives, artificial or natural, or both, whether in the form of sheets, strips, disks, belts, sleeves, or similar forms	X.	5% ad val.	20% ad val.
519.61	00	Hones, whetstones, oilstones, and polishing stones, all the foregoing (except emery files or stones), with or without handles, designed to be used directly in the hand	No.	Free	Free
		Millstones, abrasive wheels, and abrasive articles not specially provided for:			
519.71	00	Burrstones, manufactured or bound up into millstones	Ton.	Free	Free
		Abrasive wheels:			
519.81	00	Solid natural stone wheels	No.	Free	Free
519.83	00	Of diamond	No.	12% ad val.	30% ad val.
		Other:			
519.84	00	Bonded with synthetic resins	Lb.	16.8¢ per lb. + 13.5% ad val.	50¢ per lb. + 40% ad val.
519.86	00	Other	X.	8% ad val.	20% ad val.
		Other:			
519.91	00	Of emery or garnet	X.	8% ad val.	20% ad val.
519.93	00	Of pumice	X.	11% ad val.	35% ad val.
519.95	00	Of natural corundum or of artificial abrasive materials	X.	4% ad val.	20% ad val.
519.97	00	Other	X.	12% ad val.	30% ad val.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1969)

STAGED RATES AND HISTORICAL NOTES

Notes p. 1
Schedule 5,
Part 1

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3694 (Canadian Compensation), Dec. 27, 1965, 3 CFR, 1965 Supp., p. 85, as modified by Pres. Proc. 3818, Nov. 6, 1967, 32 F.R. 15487:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1966	1967	1968	1969	1970
513.35 1/	20¢ per short ton	18¢ per short ton	16¢ per short ton	2/	2/	2/
513.36 1/	20¢ per short ton	18¢ per short ton	16¢ per short ton	14¢ per short ton	12¢ per short ton	10¢ per short ton

1/ Formerly part of TSUS item 513.34.
2/ See Kennedy Round staged rates, infra.

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
511.11	3¢ per 100 lbs., including weight of container	2.5¢ per 100 lbs., including weight of container	2¢ per 100 lbs., including weight of container	2¢ per 100 lbs., including weight of container	1.5¢ per 100 lbs., including weight of container	1¢ per 100 lbs., including weight of container
511.14	2.25¢ per 100 lbs., including weight of container	1.5¢ per 100 lbs., including weight of container	1.3¢ per 100 lbs., including weight of container	0.9¢ per 100 lbs., including weight of container	0.4¢ per 100 lbs., including weight of container	Free
511.21	5% ad val.	4% ad val.	3% ad val.	2% ad val.	1% ad val.	Free
511.25	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
511.41	26% ad val.	23% ad val.	20.5% ad val.	18% ad val.	15.5% ad val.	13% ad val.
511.51	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
511.61	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
511.71	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
512.11	3¢ per 100 lbs., including weight of container	2¢ per 100 lbs., including weight of container	1.5¢ per 100 lbs., including weight of container	1¢ per 100 lbs., including weight of container	0.5¢ per 100 lbs., including weight of container	Free
512.14	2.5¢ per 100 lbs., including weight of container	2¢ per 100 lbs., including weight of container	1.5¢ per 100 lbs., including weight of container	1¢ per 100 lbs., including weight of container	0.5¢ per 100 lbs., including weight of container	Free
512.24	$1.19 per ton	$1.07 per ton	95¢ per ton	83¢ per ton	71¢ per ton	59¢ per ton
512.31	$10 per ton	$9 per ton	$8 per ton	$7 per ton	$6 per ton	$5 per ton
512.35	$14 per ton	$12.60 per ton	$11.20 per ton	$9.80 per ton	$8.40 per ton	$7 per ton
512.41	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
512.44	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
513.11	50¢ per ton	45¢ per ton	40¢ per ton	35¢ per ton	30¢ per ton	25¢ per ton
513.21	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
513.31	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
513.35	16¢ per short ton	Free	Free	Free	Free	Free
513.36	16¢ per short ton	14¢ per short ton	12¢ per short ton	10¢ per short ton	10¢ per short ton	10¢ per short ton
513.41	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
513.51	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
513.71	1¢ per cu. ft.	Free	Free	Free	Free	Free
513.74	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
513.81	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
513.84	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
513.94	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
514.11	20¢ per short ton	18¢ per short ton	16¢ per short ton	14¢ per short ton	12¢ per short ton	10¢ per short ton
514.21	2¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.
514.24	21% ad val	18.5% ad val.	16.5% ad val.	14.5% ad val.	12.5% ad val.	10.5% ad val.
514.34	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
514.41	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
514.44	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
514.51	27.5¢ per cu. ft.	24¢ per cu. ft.	22¢ per cu. ft.	19¢ per cu. ft.	16¢ per cu. ft.	13.5¢ per cu. ft.
514.54	32.5¢ per cu. ft.	29¢ per cu. ft.	26¢ per cu. ft.	22¢ per cu. ft.	19¢ per cu. ft.	16¢ per cu. ft.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1969)

STAGED RATES AND HISTORICAL NOTES

Notes p. 2
Schedule 5,
Part 1

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002 (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
514.57	50¢ per cu. ft.	45¢ per cu. ft.	40¢ per cu. ft.	35¢ per cu. ft.	30¢ per cu. ft.	25¢ per cu. ft.
514.61	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
514.65	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.
514.81	21% ad val.	18.5% ad val.	16.5% ad val.	14.5% ad val.	12.5% ad val.	10.5% ad val.
515.11	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
515.14	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
515.21	10.5¢ per cu. ft.	9¢ per cu. ft.	8¢ per cu. ft.	7¢ per cu. ft.	6¢ per cu. ft.	5¢ per cu. ft.
515.24	21% ad val.	18.5% ad val.	16.5% ad val.	14.5% ad val.	12.5% ad val.	10.5% ad val.
515.31	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
515.34	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
515.51	2¢ per cu. ft.	1.5¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.	1¢ per cu. ft.
515.54	21% ad val.	18.5% ad val.	16.5% ad val.	14.5% ad val.	12.5% ad val.	10.5% ad val.
515.61	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
515.64	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
516.11	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
516.21	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
516.24	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
516.41	4¢ per lb.	3¢ per lb.	2¢ per lb.	1¢ per lb.	0.5¢ per lb.	Free
516.71	22.5% ad val.	20% ad val.	18% ad val.	15.5% ad val.	13% ad val.	11% ad val.
516.73	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
516.74	40% ad val.	36% ad val.	32% ad val.	28% ad val.	24% ad val.	20% ad val.
516.76	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
516.81	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
516.91	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
516.94	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
517.11	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
517.21	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
517.24	0.825¢ per lb.	0.7¢ per lb.	0.65¢ per lb.	0.55¢ per lb.	0.49¢ per lb.	0.4¢ per lb.
517.27	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
517.31	Free (formerly 517.30) 0.5% ad val. (formerly 517.33)	Free	Free	Free	Free	Free
517.51	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
517.61	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
517.71	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
517.74	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
517.81	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
517.91	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
518.21	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
518.41	0.3¢ per lb.	0.25¢ per lb.	0.24¢ per lb.	0.2¢ per lb.	0.18¢ per lb.	0.15¢ per lb.
518.44	0.225¢ per lb.	0.2¢ per lb.	0.15¢ per lb.	0.15¢ per lb.	0.1¢ per lb.	0.1¢ per lb.
518.51	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.
519.11	0.0425¢ per lb.	0.038¢ per lb.	0.034¢ per lb.	0.029¢ per lb.	0.025¢ per lb.	0.02¢ per lb.
519.14	0.08¢ per lb.	0.07¢ per lb.	0.06¢ per lb.	0.055¢ per lb.	0.045¢ per lb.	0.04¢ per lb.
519.31	0.35¢ per lb.	0.31¢ per lb.	0.28¢ per lb.	0.24¢ per lb.	0.21¢ per lb.	0.17¢ per lb.
519.37 1/	0.5¢ per lb.	0.4¢ per lb.	0.4¢ per lb.	0.3¢ per lb.	0.3¢ per lb.	0.2¢ per lb.
519.51	6.5% ad val.	5.5% ad val.	5% ad val.	4.5% ad val.	3.5% ad val.	3% ad val.
519.83	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
519.84	21¢ per lb. + 17% ad val.	18.9¢ per lb. + 15% ad val.	16.8¢ per lb. + 13.5% ad val.	14.7¢ per lb. + 11.5% ad val.	12.5¢ per lb. + 10% ad val.	10¢ per lb. + 8.5% ad val.
519.86	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
519.91	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
519.93	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.

1/ See footnote 1 at the end of this list of Staged Rates.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1969)

STAGED RATES AND HISTORICAL NOTES

Notes p. 3
Schedule 5,
Part 1

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002 (con.):

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
519.95	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
519.97	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.21	14% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.31	16% ad val.	15% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
521.52	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	5.5% ad val.	4% ad val.
520.33	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
521.45	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	5.5% ad val.	4% ad val.
520.37	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
520.70	3% ad val.	3% ad val.	1.5% ad val.	1% ad val.	0.5% ad val.	Free
520.54	5% ad val.	4% ad val.	4% ad val.	3% ad val.	2% ad val.	2.5% ad val.
520.51	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
520.41	11% ad val.	10.5% ad val.	10.5% ad val.	11.5% ad val.	12.5% ad val.	10.5% ad val.
520.01	42.5% ad val.	38% ad val.	34% ad val.	30.5% ad val.	25% ad val.	21% ad val.
520.71	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	6.5% ad val.	5% ad val.
520.75	30% ad val.	27% ad val.	24% ad val.	21% ad val.	18% ad val.	15% ad val.
521.17	55¢ per ton	41¢ per ton	33¢ per ton	27¢ per ton	11¢ per ton	Free
521.41	67¢ per ton	60¢ per ton	53¢ per ton	45¢ per ton	40¢ per ton	32¢ per ton
521.51	90¢ per ton	45¢ per ton	40¢ per ton	35¢ per ton	30¢ per ton	25¢ per ton
521.54	$1 per ton	80¢ per ton	70¢ per ton	60¢ per ton	50¢ per ton	40¢ per ton
521.61	90.4¢ per ton	73¢ per ton	65¢ per ton	57¢ per ton	48¢ per ton	40¢ per ton
521.71	92¢ per ton	58¢ per ton	52¢ per ton	46¢ per ton	40¢ per ton	17¢ per ton
521.74	$3.42 per ton	$3.13 per ton	$2.86 per ton	90¢ per ton	80¢ per ton	65¢ per ton
521.81	60¢ per ton	40¢ per ton	35¢ per ton	30¢ per ton	10¢ per ton	Free
521.88	$1 per ton	50¢ per ton	45¢ per ton	40¢ per ton	30¢ per ton	10¢ per ton
521.82	0.1¢ per lb. + 42.5% ad val.	0.09¢ per lb. + 38% ad val.	0.08¢ per lb. + 34% ad val.	0.07¢ per lb. + 30.5% ad val.	0.06¢ per lb. + 25% ad val.	0.05¢ per lb. + 21% ad val.
514.21	12.5¢ per ton	10¢ per ton	7½ per ton	5¢ per ton	2½ per ton	Free
522.81	1.8% ad val.	1.5% ad val.	0% ad val.	5% ad val.	4% ad val.	2.9% ad val.
522.46	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
521.87	$5.25 per ton	$4.72 per ton	$4.21 per ton	$3.67 per ton	$3.15 per ton	$2.62 per ton
522.64	$10.50 per ton	$9.45 per ton	$8.40 per ton	$7.35 per ton	$6.30 per ton	$5.25 per ton
532.71	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.	2% ad val.	2% ad val.
542.51	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
523.11	0.05¢ per lb.	0.02¢ per lb.	0.02¢ per lb.	0.02¢ per lb.	0.02¢ per lb.	0.02¢ per lb.
521.35	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
544.05	0.6¢ per lb.	0.5¢ per lb.	0.4¢ per lb.	0.3¢ per lb.	0.2¢ per lb.	0.1¢ per lb.

1/ In accordance with general note 3(f) to Schedule XX (Geneva - 1967), the rates of duty for this item in the columns headed 1970, 1971, 1972 will become effective unless the European Economic Community and the United Kingdom do not proceed with certain reductions provided for in their respective schedules annexed to the Geneva (1967) Protocol to the GATT. If these two participants do not so proceed, the President shall so proclaim, and the rate of duty in the column headed 1969 will continue in effect unless or until the President proclaims that they have agreed so to proceed. See related footnote 1 to Kennedy Round Staged Rates at the end of schedule 4, parts 3, 4, 5, 7, 8, 9, and 13; schedule 5, part 1; schedule 6, part 2; and schedule 7, parts 2, 9, 12, and 13.

Other Amendments and Modifications

	PROVISION
Subpt A headnote 1(b)	Subpt A--Language "(including bitumens and resins) with added sand, gravel, or other mineral aggregate" deleted and language "of mineral origin with added mineral aggregate such as sand, crushed stone, or gravel" inserted in lieu thereof. Pub. L. 89-241, Secs. 2(a), 27, Oct. 7, 1965, 79 Stat. 933, 939, effective date Dec. 7, 1965.

	PROVISION
513.34 513.35 513.36	513.34--Item 513.34 (column 1 rate--16¢ per short ton; column 2 rate--$1 per short ton) deleted and items 513.35 and 513.36 and heading immediately preceding item 513.35 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

Other Amendments and Modifications--(con.)

PROVISION	
516.98	Item 516.98 added. Pub. L. 89-283, Secs. 401(a), 405(b), Oct. 21, 1965, 79 Stat. 1021, 1024; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.
517.30 517.31 517.33	Item 517.31 (column 1 rate--0.5% ad val.; column 2 rate--10% ad val.) deleted and items 517.30 and 517.33 and heading immediately preceding item 517.30 added in lieu thereof. Pub. L. 89-433, Secs. 1(a), (c), May 31, 1966, 80 Stat. 169, effective date July 1, 1966. The rates of duty for item 517.31 had been temporarily suspended for graphite valued $50 per ton or less by former item 909.20. Items 517.30 (column 1 rate--free; column 2 rate--10% ad val.) and 517.33 (column 1 rate--0.5% ad val.; column 2 rate--10% ad val.) and heading immediately preceding item 517.30 deleted and item 517.31 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

PROVISION	
517.82	Item 517.82 added. Pub. L. 89-283, Secs. 401(a), 405(d), Oct. 21, 1965, 79 Stat. 1021, 1025; entered into force Dec. 20, 1965, by Pres. Proc. 3682, Oct. 21, 1965, 3 CFR, 1965 Supp., p. 68; effective with respect to articles entered on and after Jan. 18, 1965.
520.19 520.20 520.21	Item 520.21 (column 1 rate--15% ad val.; column 2 rate--30% ad val.) deleted and new items 520.19, 520.20, and 520.21 and heading immediately preceding item 520.19 added in lieu thereof. Pub. L. 89-241, Sec. 28, Oct. 7, 1965, 79 Stat. 934, effective date Oct. 8, 1965.
520.34	Item 520.34 (Cuba--8% ad val.) deleted. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.
521.71	Column 1 rate of duty of 75¢ per ton reduced to 62½ per ton on Jan. 1, 1968. General headnote 3(g).
521.74	Column 1 rate of duty of $1.45 per ton reduced to $1.21 per ton on Jan. 1, 1968. General headnote 3(g).

Statistical Notes

PROVISION	Effective date
511.14--	
00--Disc.(transferred to 511.1420 & 40)	*Jan. 1, 1964*
20--Estab.(transferred from 511.1400pt)	*do*
40--Estab.	*do*
513.34--See Other Amendments and Modifications	
00--Disc.(transferred to 513.3500 & 513.3600)	*Jan. 1, 1968*
513.35--See Other Amendments and Modifications	
00--Estab.(transferred from 513.3400pt)	*Jan. 1, 1968*
513.36--See Other Amendments and Modifications	
00--Estab.(transferred from 513.3400pt)	*Jan. 1, 1968*
516.41--	
10--Estab.(transferred from 516.4140)	*Jan. 1, 1966*
20--Disc.(transferred to 516.4150pt)	*do*
40--Disc.(transferred to 516.4110)	*do*
50--Estab.(transferred from 516.4120 & 60)	*do*
60--Disc.(transferred to 516.4150pt)	*do*
516.98--See Other Amendments and Modifications	
00--Estab.(transferred from 516.7100pt-516.7600pt & 516.9400pt)	*Dec.20, 1965*
517.30--See Other Amendments and Modifications	
00--Estab.(transferred from 909.2000)	*July 1, 1966*
Disc.(transferred to 517.3100)	*Jan. 1, 1968*
517.31--See Other Amendments and Modifications	
00--Natural graphite valued $50 per ton or less temporarily transferred to 909.2000	*Jan. 1, 1966*
Disc.(transferred to 517.3300)	*July 1, 1966*
Estab.(transferred from 517.3000 & 517.3300)	*Jan. 1, 1968*

PROVISION	Effective date
517.33--See Other Amendments and Modifications	
00--Estab.(transferred from 517.3100)	*July 1, 1966*
Disc.(transferred to 517.3100)	*Jan. 1, 1968*
517.61--See Amendments and Modifications (item 909.25)	
00--Electrodes when imported for use in producing aluminum temporarily transferred to 909.2500	*Oct. 8, 1965*
517.81--	
00--Articles subject to Automotive Products Trade Act (APTA) transferred to 517.8200	*Dec.20, 1965*
517.82--See Other Amendments and Modifications	
00--Estab.(transferred from 517.8100pt)	*Dec.20, 1965*
520.19--See Other Amendments and Modifications	
00--Estab.(transferred from 520.8100pt)	*Oct. 8, 1965*
520.20--See Other Amendments and Modifications	
00--Estab.(transferred from 520.8100pt)	*Oct. 8, 1965*
520.21--See Other Amendments and Modifications	
00--Synthetic mineral diamonds and synthetic powder or dust transferred to 520.1420 & 520.8000	*Oct. 8, 1965*
521.17--See Amendments and Modifications (item 909.30)	
521.71--See Other Amendments and Modifications	
521.74--See Other Amendments and Modifications	
523.41--	
00--Estab.(transferred from 523.3150 & 40)	*Jan. 1, 1968*
20--Disc.(transferred to 523.8120)	*do*
40--Disc.	*do*

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 2. - CERAMIC PRODUCTS			
		Part 2 headnotes:			
		1. This part covers ceramic wares, and articles of such wares and, in addition, certain unshaped refractory material (subpart A) closely related thereto.			
		2. For the purposes of the tariff schedules -- (a) a "ceramic article" is a shaped article having a glazed or unglazed body of crystalline or substantially crystalline structure, which body is composed essentially of inorganic nonmetallic substances and either is formed from a molten mass which solidifies on cooling, or is formed and subsequently hardened by such heat treatment that the body, if reheated to pyrometric cone 020, would not become more dense, harder, or less porous, but does not include any glass article; (b) the term "earthenware" embraces ceramic ware, whether or not glazed or decorated, having a fired body which contains clay as an essential ingredient and will absorb more than 3.0 percent of its weight of water; (c) the term "stoneware" embraces ceramic ware whether or not glazed or decorated, having a fired body which contains clay as an essential ingredient, is not commonly white, will absorb not more than 3.0 percent of its weight of water, and is naturally opaque (except in very thin pieces) even when fully vitrified; (d) the term "subporcelain" embraces fine-grained ceramic ware (other than stoneware), whether or not glazed or decorated, having a fired body which is white (unless artificially colored) and will absorb more than 0.5 percent but not more than 3.0 percent of its weight of water; (e) the terms "chinaware" and "porcelain" embrace fine-grained ceramic ware (other than stoneware), whether or not glazed or decorated, having a body which is white (unless artificially colored) and will not absorb more than 0.5 percent of its weight of water; (f) the term "bone chinaware" embraces chinaware or porcelain the body of which contains by weight 25 percent or more of calcined bone; (g) the term "nonbone chinaware" embraces chinaware or porcelain other than bone chinaware; (h) the term "coarse-grained", as applied to ceramic ware, embraces such wares having a body made of materials none of which had been washed, ground, or otherwise beneficiated; (i) the term "fine-grained", as applied to ceramic wares, embraces such wares having a body made of materials any of which had been washed, ground, or otherwise beneficiated; and (j) the term "body" includes any engobe or body slip, except engobe or body slip applied to the body as a decoration; and (k) the water absorption of a ceramic body shall be determined by ASTM test method designated C373-56 (except that test specimens may have a minimum weight of 10 grams, and may have one large surface glazed).			

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart A. - Refractory and Heat-Insulating Articles			
		Subpart A headnotes:			
		1. This subpart does not cover ceramic electrical ware (see subpart D of this part).			
		2. For the purposes of this subpart, "a heat-insulating article", whether shaped or not shaped, is one having a bulk density not over 75 pounds per cubic foot and designed to impede or resist the flow of heat at temperatures above 1600°F.			
		3. For the purposes of this subpart, "a refractory article", whether shaped or not shaped, is one having a bulk density over 75 pounds per cubic foot and designed to be used to resist temperatures above 2600°F. A shaped refractory article has special properties of strength and resistance to thermal shock and may also have, depending upon the particular uses for which designed, other special properties such as resistance to abrasion and corrosion.			
		4. For the purposes of items 531.21 and 531.24, a brick which contains both chrome and magnesite is classifiable according to which of these components is the greater by weight.			
		Refractory magnesia, including dead-burned magnesite, fused magnesia, and dead-burned dolomite:			
531.01	00	Not containing lime or containing by weight not over 4 percent lime	S. ton	0.3¢ per lb	0.75¢ per lb
531.04	00	Containing by weight over 4 percent lime	S. ton	9.5% ad val.	30% ad val.
531.11	00	Refractory and heat-insulating mortars, ramming mixes and castables; super-refractory powders	lb	12% ad val.	50% ad val.
		Refractory and heat-insulating bricks of all sizes and shapes:			
531.21	00	Chrome bricks	lb	20% ad val.	25% ad val.
531.24	00	Magnesite bricks	lb	0.3¢ per lb + 4% ad val.	0.75¢ per lb + 10% ad val.
531.27	00	Other bricks	M	1.5% ad val.	45% ad val.
		Shaped refractory and heat-insulating articles not specially provided for, and structures of refractory or heat-insulating articles:			
531.31	00	Pins, spurs, stilts, and thimbles, all the foregoing used in the manufacture of ceramic articles	No	Free	Free
531.33	00	Carbon or graphite crucibles	No	12% ad val.	45% ad val.
531.34	00	Earthenware and stoneware crucibles	No	8% ad val.	15% ad val.
531.37	00	Porcelain and subporcelain refractory articles	No	31% ad val.	60% ad val.
531.39	00	Other	X	19% ad val.	30% ad val.

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3712 (U.K. Compensation), April 5, 1966, 3 CFR, 1966 Comp., p. 35, as modified by Pres. Proc. 3818, Nov. 6, 1967, 32 F.R. 15487:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after May 1 --				
		1966	1967	1968	1969	1970
531.37	45% ad val.	40% ad val.	36% ad val.	31% ad val.	27% ad val.	22.5% ad val.

Modifications of column 1 rates of duty by Pres. Proc. 3744 (Japanese Compensation), Sept. 13, 1966, 3 CFR, 1966 Comp., p. 75, as modified by Pres. Proc. 3818, Nov. 6, 1967, 32 F.R. 15487:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after October 1 --				
		1966	1967	1968	1969	1970
545.51	30% ad val.	28% ad val.	28% ad val.	1/	1/	1/

1/ See Kennedy Round staged rates, infra.

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
531.01	0.46¢ per lb.	0.34¢ per lb.	0.34¢ per lb.	0.26¢ per lb.	0.22¢ per lb.	0.19¢ per lb.
531.04	12% ad val.	10.5% ad val.	9.5% ad val.	8% ad val.	7% ad val.	6% ad val.
531.11	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
531.21	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
531.24	0.38¢ per lb. + 5% ad val.	0.34¢ per lb. + 4.5% ad val.	0.3¢ per lb. + 4% ad val.	0.25¢ per lb. + 3.5% ad val.	0.2¢ per lb. + 3% ad val.	0.19¢ per lb. + 2.5% ad val.
531.27	3% ad val.	2% ad val.	1.5% ad val.	1% ad val.	0.5% ad val.	Free
531.33	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
531.35	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
531.39	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
532.11	80¢ per 1,000	60¢ per 1,000	40¢ per 1,000	20¢ per 1,000	10¢ per 1,000	Free
532.14	6% ad val.	5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.
532.31	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
532.42	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
532.61	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
533.11	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
533.14	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
533.16	6.25% ad val.	6% ad val.	5% ad val.	4% ad val.	4% ad val.	6% ad val.
537.43	10¢ per doz. pcs. + 25% ad val.	9¢ per doz. pcs. + 25% ad val.	8¢ per doz. pcs. + 22% ad val.	7¢ per doz. pcs. + 19.5% ad val.	6¢ per doz. pcs. + 16.5% ad val.	5¢ per doz. pcs. + 14% ad val.
533.25	10¢ per doz. pcs. + 37% ad val.	10¢ per doz. pcs. + 33.5% ad val.	10¢ per doz. pcs. + 30.5% ad val.	10¢ per doz. pcs. + 27% ad val.	10¢ per doz. pcs. + 24% ad val.	10¢ per doz. pcs. + 21% ad val.
534.28	10¢ per doz. pcs. + 21% ad val.	9¢ per doz. pcs. + 18.5% ad val.	8¢ per doz. pcs. + 16.5% ad val.	7¢ per doz. pcs. + 14.5% ad val.	6¢ per doz. pcs. + 12.5% ad val.	5¢ per doz. pcs. + 10.5% ad val.
535.31	10¢ per doz. pcs. + 25% ad val.	9¢ per doz. pcs. + 22% ad val.	8¢ per doz. pcs. + 20% ad val.	7¢ per doz. pcs. + 17% ad val.	6¢ per doz. pcs. + 15% ad val.	5¢ per doz. pcs. + 12.5% ad val.
535.33	10¢ per doz. pcs. + 25% ad val.	9¢ per doz. pcs. + 22% ad val.	8¢ per doz. pcs. + 20% ad val.	7¢ per doz. pcs. + 17% ad val.	6¢ per doz. pcs. + 15% ad val.	5¢ per doz. pcs. + 12.5% ad val.
535.38	10¢ per doz. pcs. + 40% ad val.	10¢ per doz. pcs. + 36% ad val.	10¢ per doz. pcs. + 32% ad val.	10¢ per doz. pcs. + 28.5% ad val.	10¢ per doz. pcs. + 24.5% ad val.	10¢ per doz. pcs. + 21% ad val.
538.70	10¢ per doz. pcs. + 22% ad val.	10¢ per doz. pcs. + 21.5% ad val.	10¢ per doz. pcs. + 21.5% ad val.	10¢ per doz. pcs. + 21% ad val.	10¢ per doz. pcs. + 21% ad val.	10¢ per doz. pcs. + 21% ad val.
653.56	10¢ per doz. pcs. + 22% ad val.	9¢ per doz. pcs. + 19.5% ad val.	8¢ per doz. pcs. + 17.5% ad val.	7¢ per doz. pcs. + 15% ad val.	6¢ per doz. pcs. + 13% ad val.	5¢ per doz. pcs. + 11% ad val.

A P P E N D I X B

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries: Amount in 1967	All countries: Percent change from 1966	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Hydraulic cement and cement clinker (p. 5)								
511.11	883	-11.3	Belgium	389	Japan	217	Denmark	123
511.14	13,816	-18.1	Bahamas	5,951	Canada	4,087	Norway	1,586
Concrete mixes and articles of concrete (p.17)								
511.21	15	-62.2	Denmark	14	Canada	1	U King	2/
511.25	17	-10.2	U King	16	Canada	2/	Denmark	2/
511.31	933	-20.8	Mexico	819	U King	75	Italy	25
511.41	2	-71.5	Japan	2	-	-	-	-
511.51	1/	3/	-	-	-	-	-	-
511.61	54	-43.4	Canada	29	W Germ	15	Mexico	4
511.71	3	-53.6	Japan	3	Canada	2/	Spain	2/
Lime (p. 25)								
512.11	12	157.4	Canada	9	Dom Rep	3	-	-
512.14	961	-45.8	Canada	960	France	1	-	-
Gypsum rock and gypsum plaster (p. 31)								
512.21	9,723	-38.3	Canada	7,770	Mexico	1,065	Jamaica	505
512.24	86	- 5.3	U King	78	W Germ	4	Kor Rep	2
512.31	1/	3/	-	-	-	-	-	-
512.35	1/	3/	-	-	-	-	-	-
Articles of plaster of Paris (p. 39)								
512.41	613	57.2	Spain	359	U King	125	Italy	94
512.44	76	39.5	Mexico	30	Italy	16	Canada	8
Sand and gravel (p. 45)								
513.11	159	66.7	Australia	134	Rep SAf	18	Canada	4
513.14	753	- 8.1	Canada	753	-	-	-	-
Crushed or ground stone (p. 53)								
513.21	127	8.7	Italy	115	Canada	7	Mexico	3
513.31	1/	-	-	-	-	-	-	-
513.34	1,529	21.1	Canada	1,440	Bahamas	79	Mexico	10
513.42	1,079	-18.1	Canada	1,058	Panama	9	Italy	6
Marble, jet, alabaster, and chalk articles, and stone sculptures, not elsewhere enumerated (p. 59)								
513.51	266	-26.9	Italy	251	Japan	1	Israel	1
513.94	855	-13.2	Italy	842	Spain	6	Greece	1
514.34	1	-79.9	U King	1	Japan	2/	-	-
514.81	3,776	- 7.0	Italy	2,900	Portugal	554	Mexico	161
Stone, crude and not suitable for use as monumental, paving, or building stone (p. 63)								
513.61	11	- .9	Canada	6	Sweden	3	Norway	2
513.91	2/	3/	Italy	2/	-	-	-	-
514.11	121	-65.4	Canada	118	W Germ	2	France	1
514.41	22	38.5	Canada	19	Mexico	1	Italy	1

See footnotes at end of table.

APPENDIX B

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Monumental, paving, and building stone (p. 69)								
513.71	1,001	22.3	Canada	661	Sweden	133	Norway	107
513.74	1,662	43.7	Canada	938	Italy	444	Finland	102
514.21	3	888.5	Italy	1	Canada	1	Israel	1
514.24	72	4.8	Canada	48	Italy	22	W Germ	2
514.51	328	- 3.7	Italy	239	Norway	23	Belgium	17
514.54	32	8.2	Mexico	32	-	-	-	-
514.57	38	19.7	Canada	16	Portugal	12	Italy	7
514.61	816	-24.5	Italy	731	Belgium	31	Portgual	18
514.65	4,323	-20.8	Italy	3,080	Portugal	1,110	W Germ	46
515.21	138	-15.0	Italy	138	-	-	-	-
515.24	1,035	-22.6	Italy	1,025	Japan	5	Belgium	4
515.51	9	-17.0	Canada	8	U King	1	Mexico	2/
515.54	41	1,334.3	Italy	19	W Germ	15	Israel	1
Articles of stone, not elsewhere enumerated (p. 85)								
513.81	60	-13.7	Italy	35	U King	12	Japan	11
513.84	11	319.0	Sweden	4	Italy	3	France	2
514.41	22	38.5	Canada	19	Mexico	1	Italy	1
514.44	26	-21.0	Italy	25	W Germ	2/	Belgium	2/
515.31	73	-34.0	Italy	73	-	-	-	
515.34	4	245.7	Italy	4	-	-	-	-
515.61	128	- 6.9	W Germ	45	Canada	24	Mexico	20
515.64	29	3.9	Italy	11	Japan	6	India	2
Quartzite (p. 89)								
514.91	260	-55.8	Sweden	101	Brazil	62	Canada	48
Slate, and articles of slate (p. 93)								
515.11	1/	-	-	-	-	-	-	-
515.14	2,333	57.8	Italy	1,983	Portugal	329	Japan	9
Mica, not manufactured, and mica films and splittings (p. 97)								
516.11	1/	-	-	-	-	-	-	-
516.31	1,320	-53.7	Brazil	930	India	349	Argentina	16
516.41	670	-41.2	Brazil	237	India	207	Tanzania	109
516.51	1,700	-36.9	India	1,534	Malagas	148	Brazil	16
516.61	300	-64.0	India	245	Brazil	49	Sweden	3
Waste and scrap mica (p. 107)								
516.21	2	-89.8	Canada	1	Rep SAf	1	-	-
516.24	23	-59.0	Brazil	16	India	6	Mexico	2/
Mica, cut or stamped to dimensions, shape, or form (p. 113)								
516.71	1,049	-61.0	India	850	Mexico	98	U King	55
516.73	42	-60.2	India	40	Brazil	2	-	-
516.74	16	3.9	U King	7	India	6	Austria	3
516.76	109	-17.8	Rhodesia	28	Mexico	20	India	18
516.98	1/	3/	-	-	-	-	-	-
Mica, ground or pulverized (p. 121)								
516.81	21	89.4	France	18	Rep SAf	2	Japan	1

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries: Amount in 1967	All countries: Percent change from 1966	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Built-up mica and articles of mica, not elsewhere enumerated (p. 127)								
516.91	57	-34.8	Belgium	21	Canada	14	W Germ	13
516.94	79	-23.6	Canada	26	U King	25	France	21
Carbon and graphite products (p. 133)								
517.11	37	217.0	W Germ	19	Canada	9	Switzerland	6
517.61	10,448	74.9	Japan	4,922	Netherlands	4,759	U King	359
517.71	432	- 7.7	France	241	Japan	68	Belgium	52
517.74	192	80.7	W Germ	88	France	67	Italy	15
517.81	1,160	.3	U King	407	Canada	236	France	233
517.82	110	20.7	Canada	110	-	-	-	-
517.91	816	-31.6	W Germ	257	Japan	251	U King	152
Graphite, natural (p. 143)								
517.21	364	-26.7	Malagas	354	Turkey	6	Austria	4
517.24	147	-31.9	Malagas	103	W Germ	43	France	1
517.27	4	3/	W Germ	4	-	-	-	-
517.30	913	130.2	Mexico	893	Kor Rep	18	Ceylon	2
Calcined petroleum and coal coke not suitable for fuel (p. 151)								
517.51	13	-84.4	Canada	13	-	-	-	-
Carbon or graphite crucibles (p. 155)								
531.33	46	118.3	U King	24	Switzerland	6	W Germ	5
Asbestos, not manufactured (p. 159)								
518.11	65,744	-10.1	Canada	59,164	Rep SAf	5,298	Rhodesia	897
Asbestos textile products (p. 167)								
518.21	1,007	15.5	U King	474	Japan	237	Canada	214
Articles in part of asbestos and hydraulic cement (p. 173)								
518.41	1,916	-26.1	Japan	1,040	Mexico	240	Italy	215
518.44	2,136	8.2	Belgium	1,454	Canada	530	Mexico	82
Asbestos articles (p. 181)								
518.51	1,439	- 1.1	Canada	651	U King	533	W Germ	91
Burrstones, whetstones, hones, oilstones, and solid natural stone wheels (p. 185)								
519.01	1/	3/	-	-	-	-	-	-
519.61	79	- 5.2	Japan	40	W Germ	26	U King	6
519.71	1/	-	-	-	-	-	-	-
519.81	13	59.6	U King	11	Japan	1	Greece	2/
Pumice and articles of pumice (p. 189)								
519.05	504	-10.0	Greece	271	Italy	231	Lw Ww I	1
519.11	28	-51.3	Italy	27	Honduras	1	-	-
519.14	21	-36.9	Italy	21	-	-	-	-
519.31	76	-53.2	Italy	76	-	-	-	-
519.93	5	-57.3	Italy	5	Japan	2/	-	-
523.61	17	18.9	W Germ	9	Italy	4	Netherlands	2

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Abrasives, natural and artificial (p. 199)								
519.17	522	-34.2	France	402	Rhodesia	53	Belgium	37
519.21	27,938	-15.6	Canada	27,594	Norway	249	W Germ	66
519.34	1/	3/	-	-	-	-	-	-
519.37	2,170	-11.6	W Germ	625	U King	603	France	312
Coated abrasives (p. 211)								
519.51	4,292	3.2	W Germ	2,092	Switzerland	601	U King	375
Abrasive wheels and other abrasive articles not elsewhere enumerated (p. 219)								
519.83	242	13.6	Switzerland	160	W Germ	23	U King	19
519.84	220	59.2	W Germ	70	Italy	66	U King	35
519.86	532	25.9	U King	141	W Germ	114	Italy	61
519.91	7	-59.4	Japan	3	W Germ	3	U King	1
519.95	211	108.7	France	78	W Germ	54	Japan	40
519.97	65	34.1	U King	28	W Germ	15	Italy	7

1/ No imports in 1967.
2/ Less than $500.
3/ No imports in 1966.

A P P E N D I X C

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1968.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1968

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1968	Percent change from 1967	Country	Value	Country	Value	Country	Value
Hydraulic cement and cement clinker (p. 5)								
511.11	1,033	16.9	Belgium	571	Japan	218	Denmark	125
511.14	16,456	19.1	Bahamas	7,279	Canada	4,837	Norway	2,982
Concrete mixes and articles of concrete (p. 17)								
511.21	48	216.6	Canada	33	Denmark	9	France	4
511.25	7	-59.0	Denmark	6	Canada	1	-	-
511.31	1,130	21.1	Mexico	1,019	U King	61	Italy	48
511.41	1/	-	-	-	-	-	-	-
511.51	21	2/	U King	21	-	-	-	-
511.61	207	285.2	Canada	200	Mexico	4	Spain	3
511.71	20	478.5	Japan	15	Spain	3	Mexico	1
Lime (p. 25)								
512.11	21	75.5	Canada	21	-	-	-	-
512.14	877	- 8.7	Canada	874	France	3	-	-
Gypsum rock and gypsum plaster (p. 31)								
512.21	11,384	17.1	Canada	8,976	Mexico	1,380	Jamaica	734
512.24	89	4.0	U King	88	Canada	1	-	-
512.31	1/	2/	-	-	-	-	-	-
512.35	1/	2/	-	-	-	-	-	-
Articles of plaster of Paris (p. 39)								
512.41	527	-13.9	Spain	298	U King	126	Italy	71
512.44	126	66.6	Mexico	63	Italy	21	Spain	11
Sand and gravel (p. 45)								
513.11	144	-47.1	Australia	61	Rep SAf	41	Sweden	36
513.14	984	30.8	Canada	982	Norway	1	U King	1
Crushed or ground stone (p. 53)								
513.21	89	-30.1	Italy	69	Canada	18	Mexico	2
513.31	1	2/	Italy	1	-	-	-	-
513.35	1,199	2/	Canada	1,172	Bahamas	27	-	-
513.36	879	2/	Canada	825	Bahamas	47	Mexico	7
513.41	1,599	48.2	Canada	1,589	Italy	5	Norway	4
Marble, jet, alabaster, and chalk articles, and stone sculptures, not elsewhere enumerated (p. 59)								
513.51	251	- 5.4	Italy	237	France	6	U King	6
513.94	932	9.0	Italy	896	Spain	15	Japan	6
514.34	12	1244.6	Italy	5	Switzerland	2	Spain	2
514.81	4,163	10.2	Italy	3,209	Portugal	541	Mexico	186
Stone, crude and not suitable for use as monumental, paving, or building stone (p. 63)								
513.61	18	57.3	Norway	6	Rep SAf	5	Canada	5
513.91	3/	-42.2	Italy	3/	-	-	-	-
514.11	68	-44.4	Canada	62	W Germ	3	France	1
514.41	10	-54.1	W Germ	5	Spain	4	Canada	1

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1968

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries: Amount in 1968	All countries: Percent change from 1967	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Monumental, paving, and building stone (p. 69)								
513.71	1,088	8.7	Canada	6[illegible]0	Sweden	139	Rep SAf	95
513.74	3,115	87.4	Italy	1,4[illegible]0	Canada	1,309	Finland	127
514.21	8	165.0	Canada	6	Italy	2	-	-
514.24	35	-50.8	Canada	27	Italy	8	W Germ	3/
514.51	270	-17.5	Italy	170	Greece	28	France	14
514.54	13	-60.9	Argentina	12	Mexico	3/	-	-
514.57	82	115.2	Italy	33	Greece	31	Canada	10
514.61	762	- 6.7	Italy	694	Portugal	23	Belgium	23
514.65	5,944	37.5	Italy	4,554	Portugal	1,222	Belgium	57
515.21	129	- 6.4	Italy	129	-	-	-	-
515.24	1,404	35.7	Italy	1,387	India	13	Mexico	3
515.51	6	-36.3	Canada	5	Mexico	1	-	-
515.54	16	-60.5	Mexico	8	W Germ	4	Italy	1
Articles of stone, not elsewhere enumerated (p. 85)								
513.81	66	9.2	Italy	30	U King	14	Sweden	10
513.84	7	-31.3	Finland	4	Italy	2	Canada	1
514.41	10	-54.1	W Germ	5	Spain	4	Canada	1
514.44	21	-20.0	Italy	20	Belgium	1	-	-
515.31	64	-13.1	Italy	64	-	-	-	-
515.34	4	1.3	Italy	4	-	-	-	-
515.61	126	- 1.7	Japan	33	W Germ	33	Canada	24
515.64	84	191.9	Mexico	55	Japan	8	India	6
Quartzite (p. 89)								
514.91	273	4.9	Sweden	153	Canada	83	W Germ	19
Slate, and articles of slate (p. 93)								
515.11	1	2/	Italy	1	-	-	-	-
515.14	2,130	- 8.7	Italy	1,733	Portugal	273	U King	101
Mica, not manufactured, and mica films and splittings (p. 97)								
516.11	1	2/	Mexico	1	Brazil	3/	-	-
516.31	1,041	-21.1	Brazil	710	India	329	Tnzania	2
516.41	499	-25.5	Brazil	250	India	101	Malagas	92
516.51	1,339	-21.2	India	1,237	Malagas	89	Mozambq	6
516.61	233	-22.4	India	119	Jamaica	67	Brazil	39
Waste and scrap mica (p. 107)								
516.21	5	177.3	Malagas	5	-	-	-	-
516.24	71	216.0	India	61	Brazil	6	Rep SAf	4
Mica, cut or stamped to dimensions, shape, or form (p. 113)								
516.71	1,444	37.7	India	1,211	Mexico	123	U King	61
516.73	64	50.2	India	59	Brazil	4	U King	1
516.74	5	-71.7	India	3	Taiwan	2	-	-
516.76	122	11.0	India	31	Mexico	23	Rep SAf	20
516.98	1/	2/	-	-	-	-	-	-
Mica, ground or pulverized (p. 121)								
516.81	13	-37.6	France	12	India	1	-	-

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1968

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries: Amount in 1968	All countries: Percent change from 1967	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Built-up mica and articles of mica, not elsewhere enumerated (p. 127)								
516.91	77	35.3	W Germ	49	Canada	17	Belgium	9
516.94	76	- 4.3	U King	39	Taiwan	12	India	11
Carbon and graphite products (p. 133)								
517.11	39	5.6	U King	33	Switzerland	4	Italy	2
517.61	7,642	-26.9	Japan	6,921	Italy	350	Nethlds	146
517.71	564	30.6	France	289	Japan	118	W Germ	75
517.74	186	- 2.9	France	102	Japan	34	W Germ	26
517.81	1,216	4.9	U King	516	W Germ	301	France	157
517.82	222	102.5	Canada	222	-	-	-	-
517.91	930	14.1	U King	287	Japan	221	Canada	148
Graphite, natural (p. 143)								
517.21	292	-19.8	Malagas	290	Turkey	2	-	-
517.24	300	104.9	W Germ	170	Malagas	121	Nethlds	4
517.27	64	1395.4	W Germ	50	Italy	10	Rep SAf	3
517.30	1/	-	-	-	-	-	-	-
Calcined petroleum and coal coke not suitable for fuel (p. 151)								
517.51	104	691.7	Canada	104	-	-	-	-
Carbon or graphite crucibles (p. 155)								
531.33	32	-30.2	U King	17	Switzerland	10	Canada	2
Asbestos, not manufactured (p. 159)								
518.11	72,930	10.9	Canada	65,351	Rep SAf	6,536	Rhodesia	520
Asbestos textile products (p. 167)								
518.21	1,324	31.5	Canada	571	U King	407	Japan	294
Articles in part of asbestos and hydraulic cement (p. 173)								
518.41	2,971	55.1	Japan	1,759	Mexico	516	Belgium	315
518.44	2,487	16.5	Belgium	1,777	Canada	603	Australia	56
Asbestos articles (p. 181)								
518.51	944	-34.4	U King	582	Denmark	37	Italy	35
Burrstones, whetstones, hones, oilstones, and solid natural stone wheels (p. 185)								
519.01	1/	-	-	-	-	-	-	-
519.61	73	- 7.5	Japan	39	W Germ	14	U King	12
519.71	4	2/	Japan	3	U King	1	-	-
519.81	9	-32.7	U King	7	Ireland	1	Belgium	3/

See footnotes at end of table.

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1968

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries: Amount in 1968	All countries: Percent change from 1967	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Pumice and articles of pumice (p. 189)								
519.05	615	22.1	Greece	367	Italy	248	-	-
519.11	44	59.9	Italy	44	-	-	-	-
519.14	25	16.0	Italy	25	-	-	-	-
519.31	121	59.0	Italy	116	Austria	5	-	-
519.93	5	2.7	Italy	3	Hong Kong	1	U King	3/
523.61	12	-30.7	Italy	7	W Germ	3	U King	1
Abrasives, natural and artificial (p. 199)								
519.17	819	56.8	France	505	Turkey	165	Rep SAf	49
519.21	31,656	13.3	Canada	31,215	Norway	360	W Germ	37
519.34	1/	2/	-	-	-	-	-	-
519.37	2,816	29.8	U King	863	W Germ	585	France	543
Coated abrasives (p. 211)								
519.51	5,764	34.3	W Germ	2,308	Switzerland	848	Canada	594
Abrasive wheels and other abrasive articles, not elsewhere enumerated (p. 219)								
519.83	308	27.6	Switzerland	142	W Germ	50	Italy	50
519.84	262	19.1	W Germ	99	U King	63	Canada	33
519.86	527	- 1.0	W Germ	160	U King	112	Japan	69
519.91	26	272.1	W Germ	13	Japan	8	U King	2
519.95	176	-16.2	Japan	61	France	38	W Germ	38
519.97	47	-28.6	W Germ	17	U King	17	Colombia	3

1/ No imports in 1968.
2/ No imports in 1967.
3/ Less than $500.

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Schedule	*Volume*	*Title*
1	1	Animals and Meats
1	2	Fish: Fresh, Chilled, Frozen, or Cured
1	3	Fish Products, Shellfish, and Shellfish Products
1	4	Dairy Products and Birds' Eggs
1	5	Live Plants and Seeds
1	6	Cereal Grains, Malts, Starches, and Animal Feeds
1	7	Vegetables and Edible Nuts
1	8	Edible Fruit
1	9	Sugar, Cocoa, Confectionery, Coffee, Tea and Spices
1	11	Tobacco and Tobacco Products
1	12	Animal and Vegetable Fats and Oils
1	13	Hides, Skins, Leather, Feathers, and Miscellaneous Articles of Animal Origin
2	1	Wood and Related Products I
2	2	Wood and Related Products II
2	3	Paper and Related Products I
3	4	Felts, Batting, Nonwoven Fabrics, Fish Nets, Machinery Belts and Clothing, Hose, Coated Fabrics, and Other Fabrics for Special Purposes
3	5	Textile Furnishings and Apparel
3	6	Cordage, Braids, Elastic Yarns and Fabrics, Trimmings, Packing, Polishing Cloths, Sacks, Labels, Lacings, Rags, and Other Miscellaneous Textile Products
4	2	Inorganic Chemicals I
4	3	Inorganic Chemicals II
4	4	Inorganic Chemicals III
4	6	Organic Chemicals II
4	9	Glue, Gelatin, Aromatic Substances, Toilet Preparations, Surface-Active Agents, Soaps, Dyes, and Tannins
4	10	Pigments, Inks, Paints, and Related Products
4	12	Fatty Substances, Waxes, and Miscellaneous Chemical Products