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 3

Refractories; Ceramic Construction, Household, and
Industrial Articles

TC Publication 453
Washington, D. C.
1971

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

FOREWORD

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 (abbreviated to TSUS in these volumes), 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, when completed, the current series of summaries 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 3

C O N T E N T S

CONTENTS

Numerical List of TSUS Items in This Volume

INTRODUCTION

This volume, identified as volume 5:3, 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), which is divided into three parts. This volume deals with ceramic products classified in part 2 of schedule 5; the principle items covered are refractory articles, ceramic brick and tile, ceramic dinnerware, ceramic insulators, ceramic laboratory and chemical processing equipment, and sanitary ware. A complete list of the products covered in this volume is included in appendix A.

Apparent U.S. consumption of all the ceramic products covered by this volume was valued at more than 1.6 billion dollars in 1969. In 1969 apparent U.S. consumption, in terms of approximate value, of major items of this type was as follows: Refractory magnesia, brick, mortars, mixer, castables, and other refractory or tiles, over $375 million; ceramic brick, $319 million; ceramic tile and other ceramic construction articles, over $230 million; ceramic electrical ware, over $185 million; ceramic sanitary ware, $160 million; earthenware and chinaware, $265 million; and ferrites, $50 million.

The U.S. was a net importer of ceramic products in 1964-69. Imports of merchandise classified in part 2 of schedule 5 were valued at approximately $197 million in 1969, nearly four times the total estimated export value of $50 million for such products. Imports thus were equivalent to over 11 percent of domestic consumption by value, while exports were equivalent to only about 3 percent of total consumption.

Canada was the largest foreign market for domestically produced ceramic products in 1966-70; lesser quantities were shipped to Mexico, Japan, and various European countries. Refractory brick accounted for between one-third and one-half the value of total U.S. exports in this period.

In terms of value, approximately 66 percent of the imports in 1969 covered by this volume consisted of ceramic table and kitchen articles. Earthenware and chinaware each accounted for about one-half of this total. Floor and wall tiles, another major item, accounted for approximately 19 percent of total ceramic imports. Japan was America's leading supplier of table and kitchen articles, followed by the United Kingdom and West Germany. Most floor and wall tile was also imported from Japan.

During the 1964-67 trade negotiations under the GATT, the United States granted tariff concessions on 49 of the 57 five-digit tariff item numbers covered by this volume. Concessions were not granted on: Ceramic floor and wall tile (items 532.21, 532.24, and 532.27); certain procelain electrical insulators (535.11); non-porcelain ceramic ware not specially provided for (536.15); and porcelain and subporcelain refractory articles (531.37). Tariffs on the latter item (531.37) were reduced by 50 percent between 1966 and 1970 as a result of two

independent Presidential proclamations. One item, certain shaped refractory articles used in the manufacture of ceramic articles, (531.31) already was duty free when the talks began, and another, certain ceramic electrical ware imported from Canada as original motor-vehicle equipment, (535.15) was created as a separate duty-free item under the terms of the 1965 U.S.-Canadian automotive agreement.

Aside from china and earthen table and kitchen articles, the following trade concessions were granted on 21 items: 50 percent tariff reductions on 17 items, a 52 percent tariff reduction on one item, a 46 percent tariff reduction on another, and elimination of duties on two more. Concessions on nine chinaware items amounted to reductions of approximately 50 percent while concessions on 19 earthenware items varied from 4 percent to 50 percent depending on the particular category of items involved. In terms of 1968 import values, concessions were granted on articles valued at approximately $155.5 million; no Kennedy Round concessions were made on articles valued at approximately $41.5 million.

REFRACTORY MAGNESIA, INCLUDING DEAD-BURNED MAGNESITE AND DEAD-BURNED DOLOMITE

Commodity	TSUS item
Refractory magnesia----------	531.01-.04

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

In recent years, U.S. imports of low-lime refractory magnesia 1/ have been somewhat higher than exports, usually in the annual range of about 80 thousand short tons compared with about 65,000 tons exported; imports are equivalent to about 12 percent of domestic consumption. Imports of the high-lime refractory magnesia 2/ exceed exports of dead-burned dolomite (the nearest domestic equivalent product) by a ratio of 2/1 or more, although both imports and exports are in each case equivalent to less than 3 percent of domestic consumption.

Description and uses

The term "refractory magnesia" refers to magnesia-containing materials (such as the natural minerals magnesite, brucite, and dolomite, and a magnesium hydroxide-containing material produced from sea water or well brines) which have been fired at comparatively high temperatures (dead-burned) to obtain a lumpy or granular material that possesses excellent physical and chemical stability, withstands high temperatures, and does not react with basic open-hearth slags.

Dead-burned high-purity magnesite, dead-burned sea-water magnesia, and the high-purity fused magnesia known as "periclase" generally contain by weight less than 4 percent lime, whereas dead-burned dolomite, dead-burned natural magnesitic dolomite and dolomitic magnesite, and other dead-burned mixtures of magnesia and lime generally contain by weight more than 4 percent lime.

1/ Material containing by weight not more than 4 percent of lime.
2/ Material containing by weight more than 4 percent of lime.

REFRACTORY MAGNESIA, INCLUDING DEAD-BURNED MAGNESITE AND DEAD-BURNED DOLOMITE

Dead-burned well-brine magnesium hydroxide generally contains less than 4 percent lime.

Nearly all refractory magnesia is used in the construction and lining of furnaces for the metallurgical industries. The great bulk of consumption is in basic open-hearth steel furnaces. Probably over 90 percent of the low-lime refractory magnesia is used in the manufacture of basic refractory bricks, while nearly all high-lime refractory magnesia in granular form is used as a material for lining furnaces or as an ingredient in refractory bricks, cements, mortars, tar-bonded compositions, and similar refractory products.

In its principal applications, refractory magnesia encounters no significant competition from any other refractory material. Although to some extent competitive, refractory chrome ore in most cases supplements refractory magnesia, being blended with refractory magnesia in the interest of economy when a product of somewhat lower quality is permitted. Other refractory materials either are much more expensive or do not possess the critical properties of refractories magnesia.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Refractory magnesia, including dead-burned magnesite, fused magnesite, and dead-burned dolomite:			
531.01	Not containing lime, or containing by weight not over 4 percent lime----------	0.38¢ per lb	0.22¢ per lb.	0.10¢ per lb.
531.04	Containing by weight over 4 percent lime--------	12% ad val.	7% ad val.	6% ad val.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from concessions granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. These concessions amount to total reductions of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

For item 531.01, the ad valorem equivalent of the duty in 1970, based on imports in 1970, was 6.7 percent.

U.S. consumption

U.S. consumption of low-lime refractory magnesia in the period 1965-69 ranged from 690,000 short tons, 1/ valued at $46.0 million in 1968 to 908,00 tons, valued at $54.2 million in 1966 (table 1); annual consumption in that period averaged 791,000 tons, valued at $49.9 million. Annual consumption of low-lime refractory magnesia was substantially higher in the past decade than formerly.

Estimated U.S. consumption of high-lime refractory magnesia, consisting principally of dead-burned dolomite, ranged from 1.9 to 2.2 million tons annually in 1965-69. Consumption of such material is lower than in the early 1960's.

U.S. producers

In 1969, low-lime refractory magnesia was produced by 8 companies at 10 plants located in seven States; three of these plants were in Michigan, two in California, and one each in Florida, Mississippi, Nevada, New Jersey, and Texas. A large plant producing dead-burned magnesite in Washington was closed near the end of 1968. Of the active plants, six used sea water, sea water bittern, or purchased magnesium hydroxide derived from sea water; three used well brines or purchased magnesium hydroxide derived from well brines; and one used magnesite or magnesite-brucite ore. The 10 plants probably had an annual capacity from 1.0 to 1.2 million tons. Some of the plants producing low-lime refractory magnesia also sold

1/ As used hereafter in this summary, the term "tons" refers to short tons.

refractory magnesia containing more than 4 percent lime as a byproduct or coproduct.

In 1969, dead-burned dolomite was produced by about 12 companies at some 15 plants in eight States including Ohio, the largest producing State. Substantial quantities also were produced in Illinois, Missouri, California, and Pennsylvania, with moderate amounts in Louisiana, Utah, and West Virginia. A refractory magnesia containing more than 4 percent lime was produced in West Virginia by the same firm producing dead-burned dolomite in that State.

U.S. production

Production of low-lime refractory magnesia increased moderately through the 1950's and early 1960's; thereafter, it increased sharply to a record of 897,000 tons, valued at $56.1 million in 1965 (table 1). Following 1965, annual production declined through 1968, before rising in 1969. The average annual production in the period 1965-69 was 767,000 tons, valued at $49.6 million. Most of the increased production was supplied from sea-water magnesium hydroxide plants.

The output of dead-burned dolomite amounted to over 2.4 million tons in 1956. Thereafter, production was at a considerably lower level through 1963 before increasing to almost 2.2 million tons in each of the years 1964-66; output in 1967-69, however, was at a level 10-15 percent lower than in 1964-66. Data are not available on the production of other high-lime refractory magnesia materials. An estimated two-thirds of the tonnage of dead-burned dolomite produced in the United States is manufactured by the producing companies into refractory product form, principally tar-bonded bricks or refractory mixtures.

U.S. exports

U.S. exports of low-lime refractory magnesia (after reaching a high of 123,000 tons in 1961) were in the range of from 70,000 to 80,000 tons annually in 1962-66; in 1967-69 they declined further, to 56,000 tons in 1969 (table 3). However, in 1970, exports totaled 89,000 tons.

Japan and certain countries formerly taking sizable tonnages have constructed sea-water magnesium hydroxide plants or other facilities for supplying their own needs. Two other countries, Mexico and Canada combined, took more than two-thirds of the refractory magnesia exported by the United States in 1969-70. However, as companies in these two countries are building new plants or expanding existing facilities for producing this material, an early decline in U.S. exports to these countries is anticipated.

Exports of dead-burned dolomite and other high-lime refractory magnesia materials are not separately reported in official statistics, but are probably small and confined largely to short-distance shipments into adjacent countries.

U.S. imports

U.S. imports of low-lime refractory magnesia have fluctuated for many years. In the period 1965-70 imports ranged from 129,000 tons in 1966 to 72,000 tons in 1965 (table 4), with an annual average of 89,800 tons, valued at $6.1 million. Of the total quantity of imports in 1970, 83 percent originated in Greece and 7 percent in Japan. High-grade magnesite deposits in Greece are operated by an American producer of basic refractory brick.

Imports of high-lime refractory magnesia reached a peak of 55,000 tons, valued at $2.4 million in 1965 (table 5). Thereafter, imports declined each year, through 1969, amounting in 1969 to 11,000 tons, valued at $0.6 million; in 1970, however, imports totaled 34,000 tons. In the period 1965-67, somewhat more than half of the imports of this item was dead-burned Austrian magnesite containing over 4 percent lime, and most of the remainder was material of the same type from Yugoslavia. In 1968-70, however, there were few imports from Austria, with virtually all supplied from Yugoslavia and Canada. Canada regularly supplies small quantities of high-lime refractory magnesia produced by burning a natural mixture of magnesite and dolomite found in Quebec.

Foreign production and trade

While deposits of crude magnesite and dolomite are fairly widespread, and extensive supplies of sea water and natural magnesium brines are available, economic sources of medium to high-grade material are not plentiful. In recent years, sea-water refractory magnesia from Japan, the United Kingdom, Italy, and a few other countries has been sold in world markets from time to time. Historically, however, most refractory magnesia in Free World markets has come from Austria, Yugoslavia, and Greece.

REFRACTORY MAGNESIA, INCLUDING DEAD-BURNED MAGNESITE AND DEAD-BURNED DOLOMITE

Austria.--Several firms produce crude and dead-burned magnesite in Austria, but only two are of real importance in the industry. One of the two is a wholly-owned subsidiary of a major U.S. producer of refractories; this subsidiary ships to its parent firm, as well as to other countries in Europe and elsewhere. Its product, which contains considerable amounts of iron and lime as impurities, is used as a grain or "fettling" material in furnace bottoms, rather than for brick manufacture. The other large Austrian producer ships dead-burned magnesite to West Germany and other European countries.

Yugoslavia.--In this country producers of dead-burned magnesite are independent operators and sell wherever possible in world markets. The Yugoslavian material is of fettling quality; it is more or less comparable with the Austrian material, but generally lower in price.

Greece.--By far the major producer of dead-burned magnesite in Greece is the same U.S. producer of refractories that owns one of the important refractory magnesia operations in Austria. The Greek material is low in lime and extremely low in iron; it commands a premium price in the United States because it is suitable for use in the manufacture of high-grade magnesia refractory brick to be used in basic oxygen steelmaking furnaces and other high-temperature furnaces. In some ways it is superior even to high-quality sea-water magnesia for this purpose. With the growing use of basic oxygen steel furnaces, exports from Greece to the United States and other industrialized nations may be expected to increase.

Table 1.--Refractory magnesia (including dead-burned magnesite, dead-burned sea-water and well-brine magnesias, and fused magnesite), not containing lime or contining by weight not over 4 percent lime: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70.

(Quantity in thousands of short tons; valued in thosuands of dollars)

Year	Production 1/	Imports	Exports	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1965	897	72	72	897	8
1966	852	129	73	908	14
1967	688	76	64	700	11
1968	661	86	57	690	12
1969	737	81	56	762	11
1970	2/	95	89	2/	2/
	Value				
1965	56,100	4,214	5,912	54,402	8
1966	52,290	8,139	6,208	54,221	15
1967	43,148	5,171	5,889	42,430	12
1968	44,535	6,179	4,706	46,008	13
1969	51,843	5,449	4,973	52,319	10
1970	2/	7,357	9,133	2/	2/

1/ Sold and used by producers
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.

REFRACTORY MAGNESIA, INCLUDING DEAD-BURNED MAGNESITE AND DEAD-BURNED DOLOMITE

Table 2.--Refractory magnesia (including dead-burned dolomite), containing by weight over 4 percent lime: U.S. production and imports for consumption, 1965-70.

Year	Production 1/		Imports 2/	
	Quantity	Value	Quantity	Value
	1,000 short tons	1,000 dollars	1,000 short tons	1,000 dollars
1965	2,176	39,606	55	2,385
1966	2,193	39,725	44	2,038
1967	1,880	34,083	43	1,832
1968	1,833	31,627	34	1,552
1969	1,866	33,580	11	568
1970	3/	3/	34	1,675

1/ Domestically produced dead-burned dolomite sold and used by producers. Excludes high-lime refractory magnesia derived from other sources, such as well brines and low-grade magnesite ores.

2/ Not strictly comparable to domestic production. Imports consist mainly of dead-burned natural dolomitic magnesite containing by weight in the range of from 4 to 20 percent lime--material which is considerably higher in quality than the domestic production reported in this table.

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.

Table 3.--Dead-burned magnesite: U.S. exports of domestic merchandise by principal markets, 1965-70.

Year	Canada	Mexico	All other	Total
	Quantity (1,000 short tons)			
1965	21	25	26	72
1966	15	34	24	73
1967	20	32	12	64
1968	26	19	12	57
1969	28	11	17	56
1970	38	31	20	89
	Value (1,000 dollars)			
1965	1,908	1,778	2,226	5,912
1966	1,696	2,557	1,955	6,208
1967	2,121	2,525	1,243	5,889
1968	2,329	1,276	1,101	4,706
1969	2,528	845	1,600	4,973
1970	4,103	2,921	2,109	9,133

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

REFRACTORY MAGNESIA, INCLUDING DEAD-BURNED MAGNESITE AND DEAD-BURNED DOLOMITE

Table 4.--Refractory magnesia, not containing lime or containing by weight not over 4 percent lime: U.S. imports for consumption, by principal sources, 1965-70.

Year	Greece	Japan	Austria	Yugoslavia	All other	Total
	Quantity (1,000 short tons)					
1965	10	9	47	6	1/	72
1966	25	65	38	-	1	129
1967	31	23	11	3	8	76
1968	64	8	-	2	12	86
1969	61	15	3	2	1/	81
1970	79	7	3	-	6	95
	Value (1,000 dollars)					
1965	705	628	2,554	323	4	4,214
1966	1,868	3,907	2,261	-	103	8,139
1967	2,405	1,403	612	165	586	5,171
1968	4,778	369	-	101	931	6,179
1969	4,525	647	153	114	10	5,449
1970	6,319	380	174	-	484	7,357

1/ Less than 500 short tons.

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

REFRACTORY MAGNESIA, INCLUDING DEAD-BURNED MAGNESITE AND DEAD-BURNED DOLOMITE

Table 5.--Refractory magnesia, containing by weight over 4 percent lime: U.S. imports for consumption, by principal sources, 1965-70.

Year	Yugoslavia	Austria	Canada	Italy	All other	Total
	Quantity (1,000 short tons)					
1965	1/ 21	30	2	2	-	1/ 55
1966	19	22	2	-	1	44
1967	15	26	1	1	2/	43
1968	33	-	1	-	-	34
1969	7	-	4	-	-	11
1970	23	6	3	-	2	34
	Value (1,000 dollars)					
1965	1,008	1,161	109	107	-	2,385
1966	924	935	136	-	43	2,038
1967	692	1,040	48	41	11	1,832
1968	1,510	-	42	-	-	1,552
1969	329	-	239	-	-	568
1970	1,167	284	183	-	41	1,675

1/ Revised to correct a major error in published statistics.
2/ Less than 500 short tons.

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

Commodity	TSUS item
Refractory mortars, ramming mixes, and castables, and super-refractory powders	531.11

Note.--For the statutory description see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States is probably the largest producer and consumer of refractory mortars, ramming mixes, and castables. In recent years, the combined value of these materials amounted to $100 million in production and from $90 to $110 million in consumption, annually. Exports, which are more than ten to twenty times larger than imports, account for 6 to 12 percent of production.

Description and uses

A refractory mortar is a finely ground, air-setting-or heat-setting composition which becomes plastic and trowelable when mixed with water or other liquid; it is used in metallurgical and other industrial furnaces for laying and bonding refractory bricks.

A refractory ramming mix is a ground refractory composition that is suitable for mixing with water and ramming into place to form a monolithic furnace lining. Plastic refractories are soft, unfired refractory bricks, blocks, or other shapes formed from compositions similar to ramming mixes.

A castable refractory is a mixture of a heat-resistant aggregate and a heat-resistant hydraulic cement; the castable mixture is tempered with water and tamped or poured into place. Ramming mixes and castables provide a convenient method of forming refractory shapes or furnace linings at the location of a furnace and for patching existing furnace linings.

A super-refractory powder is any ground, highly refractory, extremely fine-grained material suitable for use in high-quality refractory compositions. This powder may be either a natural mineral such as zircon sand or a synthetic material such as silicon nitride or boron nitride.

U.S. tariff treatment

The column 1 (trade agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
531.11	Refractory and heat-insulating mortars, ramming mixes and castables; super-refractory powders---	15% ad val.	9% ad val.	7.5% ad val.

The rate in effect prior to January 1, 1968, had remained unchanged from August 31, 1963 (the effective date of the TSUS) through 1967. The fourth and final stages show two of the five annual rate modifications resulting from a concession granted by the United States in the sixth round of tariff negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for the staged rates).

U.S. consumption

U.S. consumption of refractory mortars, ramming mixes, and castables, as a group, increased regularly for many years, through 1965; in that year the apparent consumption reached 887,000 tons, 1/, valued at more than $95 million (table 1). Thereafter, in terms of value, consumption declined in each successive year, 1966-68, before increasing appreciably in 1969 and 1970. Reduced consumption in 1966 and 1967 was attributable chiefly to a sudden drop in the use of non-clay mortars, and, to a lesser extent, a decline in the consumption

1/ As used hereafter in this summary text, the term "tons" refers to short tons.

of clay mortars and ramming mixes and non-clay ramming mixes and castables. The 1969-70 increase was accounted for primarily by gains in shipments of non-clay ramming mixes and clay castables.

Most of the materials here considered are used in States having metallurgical and metal-working industries, such as Pennsylvania, Ohio, New York, Illinois, Michigan, California, and Texas.

Although different types of ground refractory materials, generally called "grain", are marketed in the United States, most production of materials referred to as "super-refractory powder" in the TSUS is of a captive nature, and information is not available concerning their production and consumption.

U.S. producers

In 1970, refractory mortars were produced by about 80 companies with 130 plants located in 24 States. Refractory ramming mixes (including plastic refractories) were produced by about 70 companies with 115 plants in some 22 States. Castable refractories were produced by about 60 companies with 95 plants in 20 States. Frequently, two or more of these products were produced in the same plant; in all there were about 95 producers manufacturing one or more of these products in about 155 plants. Virtually every producer of a broad line of refractories produced all of these products, usually at several plants located in different sections of the country.

Several large producers of these materials, who manufacture a diversified line of refractory products, employ from 5,000 to 10,000 workers. The products covered in this summary, however, probably account for less than 25 percent of the sales of these firms, whose principal product is refractory brick. For some of the small firms, one or more of these products may be the principal or only source of income; such firms generally manufacture these products for consumers located nearby.

U.S. production

The domestic output of these products, individually and as a group, was generally upward for many years, through 1965; in that year, production amounted to a record 945,000 tons, valued at more than $102 million (table 1). Of this output, 41 percent of the quantity was accounted for by ramming mixes (including plastic refractories), 37 percent by mortars, and 22 percent by castables.

In the years immediately following 1965, output of all the several product catergories, except the non-clay mortars, stayed at about the same level or increased moderately (table 2); non-clay mortars declined so sharply (more than 50 percent by 1967) as to depress the group totals markedly. Total output of all these products in 1970 amounted to 865,000 tons, valued at $124 million.

Pennsylvania, Ohio, Missouri, Illinois, Indiana, and California are believed to be the major producing States of the products considered here.

U.S. exports

Approximately 6 to 12 percent of the domestic output of refractory mortars, ramming mixes, and castables is exported. The record for exports was established in 1970 when they reached 95,000 tons, valued at $15 million (table 1). Each of the product categories in this group is exported in appreciable quantity.

U.S.-produced refractory mortars, ramming mixes, and castables are exported to a large number of countries in all parts of the world. As shown in table 3, Canada has been taking 16 to 25 percent of the total exports in recent years, followed by Italy, with 12 to 17 percent; no other country takes more than 5 or 6 percent regularly. Mexico, formerly the second largest market for these products, presumably now is able to supply most of its own needs, and hence has declined in importance as an export market.

Exports of super-refractory powders are not reported separately as such in official statistics.

U.S. imports

U.S. imports of the products considered here are small, amounting in value to about one-half million dollars in each of the years 1967-70 (table 4). Small amounts entered regularly from Sweden, Italy, the United Kingdom, and Canada during 1964-70.

A substantial part of the imports from Italy and Australia consists of natural (zircon flour) or manufactured (silicon nitride or boron nitride) super-refractory powders. Some of the imports from Canada and Sweden are intra-company shipments.

Table 1.--Refractory mortars, ramming mixes, and castables: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

Year	Production 1/	Imports 2/	Exports	Apparent consumption
	Quantity (1,000 short tons)			
1965	945	1	59	887
1966	871	2	62	811
1967	823	6	61	767
1968	821	6	74	753
1969	859	5	80	784
1970	865	5	95	775
	Value (1,000 dollars)			
196[illegible]	102,373	156	7,388	95,141
1966	100,039	244	8,649	91,634
1967	97,995	637	8,430	90,202
1968	105,099	655	10,229	95,525
1969	113,729	550	12,136	102,143
1970	124,205	437	15,115	109,527

1/ Shipments.
2/ Includes super-refractory powders.

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

Table 2.--Refractory mortars, ramming mixes, and castables: U.S. production, by types, 1965-70

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

Year	Clay		Non-Clay		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
	Mortars					
1965	76	8,842	274	25,494	350	34,336
1966	80	9,364	131	13,368	211	22,732
1967	77	10,351	111	12,086	188	22,437
1968	76	9,907	120	13,556	196	23,463
1969	78	12,349	120	13,111	198	25,460
1970	83	12,403	113	13,299	196	25,702
	Ramming mixes 1/					
1965	192	17,422	194	26,540	386	43,962
1966	202	18,677	222	31,124	424	49,801
1967	190	16,974	212	30,075	402	47,049
1968	178	17,209	210	32,400	388	49,609
1969	170	15,202	233	38,134	403	53,336
1970	172	18,100	230	39,328	402	57,428
	Castables					
1965	184	19,746	25	4,329	209	24,075
1966	209	22,067	27	5,439	236	27,506
1967	201	21,647	32	6,862	233	28,509
1968	203	24,085	34	7,942	237	32,027
1969	220	26,155	38	8,778	258	34,933
1970	225	30,785	42	10,290	267	41,075

1/ Includes data on plastic refractories, possibly amounting to 15-25 percent of the totals shown.

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

Table 3.--Refractory mortars, ramming mixes, and castables: U.S. exports of domestic merchandise, by principal markets, 1965-70

(In thousands of dollars)

Country	1965	1966	1967	1968	1969	1970
Canada	1,826	2,118	1,778	2,295	1,981	2,486
Italy	1,064	1,023	1,414	1,413	1,676	1,944
Japan	173	351	428	549	992	1,434
West Germany	145	373	215	488	588	888
Belgium	125	298	467	351	646	745
Brazil	164	360	310	451	559	716
Sweden	431	487	412	609	348	634
United Kingdom	150	143	182	318	306	418
Mexico	245	285	227	325	498	251
Spain	32	121	231	211	318	208
All other	3,033	3,090	2,766	3,219	4,224	5,391
Total	7,388	8,649	8,430	10,229	12,136	15,115

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

Table 4.--Refractory mortars, ramming mixes, castables and super-refractory powders: U.S. imports for consumption, by principal sources, 1965-70

(In Thousands of dollars)

Country	1965	1966	1967	1968	1969	1970
United Kindgom	18	12	44	57	79	91
Italy	72	31	65	69	31	59
Australia	2	27	22	44	114	36
Canada	14	13	15	6	28	18
Japan	-	-	53	73	78	11
Sweden	27	131	107	202	115	7
All other	23	30	1/ 331	2/ 204	105	3/ 215
Total	156	244	637	655	550	437

1/ Includes imports, valued at $315 thousand, from Ireland.
2/ Includes imports, valued at $185 thousand, from Ireland.
3/ Includes imports, valued at $114 thousand, from Austria.

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

Commodity	TSUS item
Refractory and heat-insulating brick-------	531.21-.27

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States is probably the world's largest producer and consumer of chrome brick, magnesite brick, and all other refractory brick, as a group. The combined output of chrome brick and magnesite brick is valued at considerably more than $100 million annually, and the value of exports of such brick exceeds the value of imports by a 3/2 margin. Total domestic production of other refractory brick (i.e., non-basic) has declined in quantity but increased in value; annual production is valued at $230 to $280 million. Exports of non-basic refractory brick are 10 to 20 times larger than imports.

Description and uses

Magnesite brick are refractory shapes, usually rectangular, of high heat resisting quality in which magnesite is the component material of chief weight. 1/ Commercially, the term magnesite brick is usually limited to brick containing 90 percent or more of magnesium oxide and the remaining brick in this group are commercially designated magnesite-chrome brick.

Chrome brick are refractory shapes, usually rectangular, of somewhat lower quality and cost than magnesite brick in which chrome ore is the component material of chief weight. 1/ When they are manufactured entirely or substantially of chrome ore they are commercially known as chrome brick. The remaining brick in this group are commercially known as chrome-magnesite brick.

In manufacture, magnesite brick or chrome brick may be either burned or unburned. Burned brick are shaped in molds and subsequently fired in kilns at high temperature, whereas the unburned brick are chemically bonded and usually formed under considerable pressure; the latter type

1/ See headnote 4 of part 2A of schedule 5, TSUSA-1971, reproduced in appendix A to this volume.

are not fired, but instead are exposed only to the heat of the kiln in which they are used. Both magnesite brick and chrome brick (often collectively referred to in the trade as "basic refractories") frequently are provided with oxidizable metallic plates on one or more of their surfaces to facilitate installation and to improve performance in service.

Other refractory and heat-insulating bricks of all sizes and shapes include fireclay brick, silica brick, high-alumina brick, ladle brick, insulating brick, mullite brick, zircon brick, zirconia brick, silicon carbide brick, brick made of blends of two or more refractory materials, and various other types of refractory brick. From a commercial standpoint, fireclay brick is the most important type of this group because of the low cost and wide adaptability of the fireclay units for industrial equipment requiring refractory products. Silica brick and insulating brick, though only moderately refractory, each have important applications.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Refractory and heat-insulating bricks of all sizes and shapes:			
531.21	Chrome bricks	25% ad val.	15% ad val.	12.5% ad val.
531.24	Magnesite bricks	0.38¢ per lb. + 5% ad val.	0.2¢ per lb. + 3% ad val.	0.19¢ per lb. + 2.5% ad val.
531.27	Other bricks	3% ad val.	0.5% ad val.	Free

The rates in effect prior to January 1, 1968 had remained unchanged from August 31, 1963 (the effective date of the TSUS), through 1967. The fourth and final stages show two of the five annual rate modifications resulting from concessions granted by the United States in the sixth round of tariff negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions amount to total reductions of 50 percent on items 531.21 and 531.24 and of 100 percent on item 531.27 (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for the staged rates).

For item 531.24, the ad valorem equivalent of the duty in 1970, based on imports in 1970, was 6.3 percent.

REFRACTORY BRICK

U.S. consumption

Apparent annual U.S. consumption of chrome brick, which reached a peak of 45.5 million units in 1959, declined consistently after that year to about one-third that quantity in 1970 (table 1).

The trend of apparent annual U.S. consumption of magnesite brick was upward through the 1950's and early 1960's, and reached a record 105 million units, valued at $97 million in 1965. Subsequently, there was a slight decline in 1966 and a greater dropoff in both 1967 and 1968. In 1969, consumption was virtually the same in terms of quantity as in 1965; the total value, however, was considerably higher (table 2). Consumption dropped sharply in 1970.

Apparent annual consumption of "all other" refractory brick, in terms of quantity, has been irregular but generally downward in the past two decades; it is believed that over a billion such brick, preponderantly fireclay and silica brick, were used in one or more of the years in the early 1950's, compared with about 800 million in 1966 and only 661 million in 1970 (table 4). In terms of value, however, the trend was different. As the consumption of relatively low-value fireclay and silica brick declined, consumption of the higher-grade, more-expensive types of refractory brick increased substantially. The 1970 figure of $242 million constitutes a record in terms of value.

U.S. producers

In 1970, refractory brick (including chrome brick, magnesite brick, and the other types) were produced by about 70 companies at 150 plants located in 25 States. Pennsylvania was first with 38 plants, followed in order by Ohio with 30, Missouri with 12, and California and Maryland with 7 each.

Magnesite brick (including magnesite-chrome brick) were produced by 14 companies at 25 plants located in 14 States; of these plants, 4 each were in Ohio and Pennsylvania, 3 in Indiana, 2 each in California, Maryland, and Massachusetts, and 1 each in Colorado, Illinois, Kentucky, Michigan, Mississippi, New York, Utah, and West Virginia.

Chrome brick (including chrome-magnesite brick) were produced by 8 companies at 15 plants located in 8 States; of these plants, 3 each were in Indiana and Pennsylvania, 2 each in California, Maryland, and Ohio, and 1 each in Mississippi, Missouri, and Utah.

Refractory brick, other than magnesite and chrome brick, were produced by about 70 companies at 140 plants located in 22 States. The following tabulation shows, for some of the more important types of refractory brick, the number of producers, plants, and producing States in 1968, according to a reliable industry source:

Type of refractory brick	Number of Producers	Number of plants	Number of States
Fireclay	36	71	17
High-alumina	32	48	17
Insulating	23	31	11
Ladle	18	32	11
Mullite	10	13	9
Silica	11	15	6
Zircon and Zirconia	10	12	8
Silicon carbide	11	12	6

Figures in the above columns are not additive because in many instances two or more types of brick are manufactured by the same producer, plant or State.

The manufacture of refractory brick is concentrated in Pennsylvania, Ohio, Maryland, New Jersey, New York, California, and other highly industrialized States, particularly those favored with natural raw materials used in the manufacture of refractory brick; Missouri, Georgia, and Alabama are among the latter.

U.S. production

Domestic production of chrome brick has been declining irregularly since reaching a record output of 47 million units, valued at $35.5 million in 1959. The general level of production, in terms of quantity, is in the range of 67 to 75 percent of that record year; in 1970, production of chrome brick amounted to 17 million units--a decline of 64 percent from the record set 11 years earlier (table 1).

Conversely, U.S. output of magnesite brick moved upwards sharply through the 1950's and early 1960's; the record output, in terms of quantity, was established in 1965, when 107 million brick, valued at $98 million, was produced (table 2). In the following three years, production declined; in 1969, however, it increased to 103.6 million units. In 1970, however, the output was approximately the same as in 1967. The record output of basic refractories, in terms of quantity, was set in 1964, when 144 million units, valued at $125 million, was produced (table 3); since then it has been at a level 10 to 20 percent lower. The total value of the output of basic refractories was at a record high of more than $133 million in 1969.

Inasmuch as 11 producers of chrome brick also produce magnesite brick, the decline in output of the former did not pose problems of a serious nature. The leveling-off of production in 1964-66 and the marked declines in 1967 and 1970, however, caused concern among major producers of basic refractories.

In terms of value, the general trend in U.S. production of the other refractory brick is upward, although certain types in the group are declining. Increased outputs have included high-alumina, super-duty fireclay, insulating, and zircon brick. A marked decline has occurred in the production of silica brick, with more moderate drops in regular fireclay, ladle, and silicon carbide brick.

U.S. production of other refractory brick, declined from 885 million units, valued at $248 million in 1966 to 749 million units, valued at $281 million in 1970 (table 4). In 1970 the value of production of other refractory brick was at a record high; in terms of quantity, however, output was far below the record.

U.S. exports

For many years U.S. producers of chrome brick and magnesite brick have exported sizable quantities of these products (tables 5 and 6), principally to Canada and Latin America, but from time to time to other market areas, such as Italy, the Far East, and Oceania. In recent years, exports of such brick have accounted for 3 to 5 percent of the domestic output. Most of the exports of chrome brick and magnesite brick combined are greater than imports of such brick (table 3).

The United States also exports substantial quantities of fireclay brick, silica brick, high-alumina brick, and the other types of refractory brick. Annual exports of these brick, as a group, during the period 1965-70 ranged from 70 million units in 1967 to 104 million units in 1969 (table 4); exports in each of those years were 10 to 20 times as large as imports. Annual exports of such brick during 1964-69 accounted for about 12 percent, in terms of value, of domestic production. Canada usually takes 50 to 60 percent, in terms of value, of total U.S. exports; the remainder is widely distributed to the countries of Latin America, Europe, the Far East, and Oceania (table 7).

U.S. imports

The United States, which imports practically no chrome brick, has for many years imported substantial quantities of magnesite brick from Canada. In 1965-70 the average annual imports were equal to about 4 percent of the domestic output, in terms of quantity.

Although in recent years Canadian magnesite brick have been imported in amounts equivalent to or greater than those imported in the late 1950's and early 1960's, imports now account for a smaller proportion of the total U.S. market than its share in those earlier years. Virtually all imports of magnesite brick from Canada have been supplied by a Canadian subsidiary of a U.S. company which is a major domestic producer of such brick. The Canadian magnesite brick differs somewhat from the U.S. product, and the imported article in effect supplements rather than displaces the domestic product in certain markets (northeastern United States) and certain uses (cement kilns).

Moderate quantities of refractory brick, other than chrome and magnesite brick, have been imported for many years. These imports consist mainly of fireclay brick from Canada and brick of uncommon size, shape, or composition from European countries; imports of these bricks, as a group, account for only about 1 percent of domestic consumption, in terms of quantity. Imports in 1969 were valued at $2.2 million--4 times the import values in 1965 (table 8); in 1970, they were valued at only half the 1969 value.

Table 1.--Chrome brick, including chrome-magnesite brick: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

Year	Production 1/	Imports 2/	Exports	Apparent consumption
	Quantity (1,000 9-inch bricks) 3/			
1965	32,491	14	2,775	29,730
1966	34,878	35	1,200	33,713
1967	22,221	-	4/ 940	21,281
1968	20,530	-	4/ 1,105	19,425
1969	21,637	5/	2,643	18,994
1970	17,045	12	1,618	15,439
	Value (1,000 dollars)			
1965	26,009	24	1,503	24,530
1966	27,209	13	1,164	26,058
1967	18,860	-	832	18,028
1968	18,264	-	847	17,417
1969	20,816	2	1,559	19,259
1970	17,931	2	1,564	16,369

1/ Shipments.

2/ Imports reported in pounds have been converted into brick at the rate of 11-1/2 pounds per brick.

3/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

4/ Partly estimated.

5/ Less than 500 units.

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

Table 2.--Magnesite brick, including magnesite-chrome brick: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

(Quantity in thousands of 9-inch equivalent; 1/ value in thousands of dollars)

Year	Production 2/	Imports 3/	Exports	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1965	107,145	3,988	6,167	104,966	3.8
1966	106,697	3,835	6,168	104,364	3.7
1967	93,823	4,339	3,375	94,787	4.6
1968	92,863	3,258	3,510	92,611	3.5
1969	103,642	4,393	3,271	104,764	4.2
1970	94,257	4,480	4,968	93,769	4.8
	Value				
1965	98,259	3,420	4,507	97,172	3.5
1966	100,446	3,258	3,988	99,716	3.3
1967	89,852	3,664	2,933	90,583	4.0
1968	96,232	2,869	4,123	94,978	3.0
1969	112,601	3,961	3,853	112,709	3.5
1970	108,092	4,212	5,977	106,327	4.0

1/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

2/ Shipments.

3/ Imports which are reported in pounds and have been converted into brick at the rate of 10-1/2 pounds per brick, virtually all entered from Canada.

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

Table 3.--Chrome brick and magnesite brick combined: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

(Quantity in thousands of 9-inch equivalent; 1/ value in thousands of dollars)

Year	Production 2/	Imports 3/	Exports	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1965	139,636	4,002	8,942	134,696	2.9
1966	141,575	3,870	7,368	138,077	2.8
1967	116,044	4,339	4/ 4,315	116,068	3.7
1968	113,393	3,258	4,615	112,036	2.9
1969	125,279	4,393	5,914	123,758	3.5
1970	111,302	4,492	6,586	109,208	4.1
	Value				
1965	124,268	3,444	6,010	121,702	2.8
1966	127,655	3,271	5,152	125,774	2.6
1967	108,712	3,664	3,765	108,611	3.4
1968	114,496	2,869	4,970	112,395	2.6
1969	133,417	3,963	5,412	131,968	3.0
1970	126,023	4,214	7,541	122,696	3.4

1/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

2/ Shipments.

3/ Imports, which are reported in pounds and have been converted into brick at the rate of 11-1/2 pounds per chrome brick and 10-1/2 pounds per magnesite brick, virtually all entered from Canada.

4/ Partly estimated.

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

Table 4.--Refractory brick other than magnesite brick and chrome brick: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

Year	Production 1/	Imports	Exports	Apparent consumption
	Quantity (1,000 9-inch bricks) 2/			
1965	3/ 871,000	3,537	83,250	791,287
1966	884,854	6,937	92,381	799,410
1967	763,675	6,939	70,358	700,256
1968	734,021	7,435	85,658	655,798
1969	785,905	6,485	105,433	686,957
1970	749,319	5,024	93,348	660,995
	Value (1,000 dollars)			
1965	233,792	547	32,160	202,179
1966	247,946	2,272	33,982	216,236
1967	237,411	1,780	29,621	209,570
1968	234,848	2,408	29,330	207,926
1969	270,964	2,236	34,791	238,409
1970	281,342	1,158	40,994	241,506

1/ Shipments.

2/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

3/ Partly estimated.

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

Table 5.--Chrome brick, including chrome-magnesite brick: U.S. exports of domestic merchandise, by principal markets, 1965-70

Country	1965	1966	1967	1968	1969	1970
	Quantity (1,000 9-inch bricks) 1/					
Canada	127	482	374	535	322	559
Chile	1,693	265	263	226	357	208
Italy	278	107	70	15	17	120
Peru	87	74	2/ 152	90	38	28
All other	590	272	81	2/ 239	3/ 1,909	703
Total	2,775	1,200	2/ 940	2/ 1,105	2,643	1,618
	Value (1,000 dollars)					
Canada	92	370	335	236	125	331
Chile	410	327	180	209	243	205
Italy	420	115	80	13	67	169
Peru	84	77	152	94	42	21
All other	497	275	85	295	3/ 1,082	838
Total	1,503	1,164	832	847	1,559	1,564

1/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

2/ Partly estimated.

3/ Includes 1,036 thousand bricks, valued at 773 thousand dollars, exported to Mexico.

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

Table 6.--Magnesite brick, including magnesite-chrome brick: U.S. exports of domestic merchandise, by principal markets, 1965-70

Country	1965	1966	1967	1968	1969	1970
	Quantity (1,000 9-inch bricks) 1/					
Canada	1,124	3,373	1,686	1,767	1,353	1,961
Chile	500	770	414	496	583	586
Italy	1,722	1,148	433	392	418	470
Turkey	581	414	277	104	2/	15
All other	2,240	463	565	751	917	1,936
Total	6,167	6,168	3,375	3,510	3,271	4,968
	Value (1,000 dollars)					
Canada	722	1,212	1,263	2,049	1,509	2,138
Chile	412	792	459	616	793	757
Italy	1,595	1,097	462	462	486	567
Turkey	397	434	260	208	2/	15
All other	1,381	453	489	788	1,065	2,320
Total	4,507	3,988	2,933	4,123	3,853	5,797

1/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

2/ Not separately reported.

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

Table 7.--Refractory brick, other than chrome brick and magnesite brick: U.S. exports of domestic merchandise, by principal markets, 1965-70

Country	1965	1966	1967	1968	1969	1970
	Quantity (1,000 9-inch bricks) 1/					
Canada	58,797	73,382	56,266	57,467	51,623	61,865
Mexico	2,442	2,999	1,871	2,884	8,742	3,904
Japan	271	384	557	994	906	1,296
Brazil	165	270	487	365	1,626	991
Australia	1,555	1,033	1,212	1,582	913	1,331
Rep. of the Philippines	837	803	890	1,112	1,680	624
All other	19,183	13,510	9,075	21,254	39,943	23,337
Total	83,250	92,381	70,358	85,658	105,433	93,348
	Value (1,000 dollars)					
Canada	15,176	20,060	16,479	15,205	14,425	19,782
Mexico	1,648	1,864	1,271	1,551	4,878	2,078
Japan	572	682	782	923	802	1,304
Brazil	168	975	354	359	1,900	1,110
Australia	937	1,090	922	1,493	500	651
Rep. of the Philippines	480	269	584	647	735	312
All other	13,179	9,042	9,229	9,152	11,551	15,757
Total	32,160	33,982	29,621	29,330	34,791	40,994

1/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

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

Table 8.--Refractory brick, other than magnesite brick and chrome brick: U.S. imports for consumption, by principal sources, 1965-70

Country	1965	1966	1967	1968	1969	1970
	Quantity (1,000 9-inch bricks) 1/					
Canada	2,262	2,355	3,813	3,803	2,772	2,127
West Germany	271	1,066	383	1,623	1,288	370
United Kingdom	37	1,773	602	717	553	256
Denmark	704	407	637	173	773	1,328
France	254	527	1,145	1,052	923	736
Japan	-	800	321	4	10	18
All other	9	9	38	63	166	189
Total	3,537	6,937	6,939	7,435	6,485	5,024
	Value (1,000 dollars)					
Canada	261	301	595	539	481	396
West Germany	73	350	145	1,399	1,202	268
United Kingdom	45	487	516	252	299	207
Denmark	53	33	55	15	82	138
France	114	224	131	172	155	101
Japan	-	875	320	5	1	13
All other	1	2	18	26	16	35
Total	547	2,272	1,780	2,408	2,236	1,158

1/ The equivalent in volume to 1,000 standard 9-inch bricks, each 9 x 4-1/2 x 2-1/2 inches in size.

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

PINS, SPURS, STILTS, AND THIMBLES USED IN THE MANUFACTURE OF CERAMIC ARTICLES

Commodity	TSUS item
Pins, spurs, stilts and thimbles	531.31

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States was self-sufficient in the production of pins, spurs, stilts and thimbles during 1966-70. Imports supplied less than 1 percent of consumption in terms of quantity; exports were several times greater than imports.

Description and uses

Pins, spurs, stilts and thimbles are inexpensive, disposable clay refractory articles used for supporting and separating ceramic dinnerware and pottery during firing. They are so shaped that the pieces being fired are supported on sharp points that will leave only a tiny scar in the glaze when removed. These supports are generally used with other kiln furniture to prevent the pieces of ware from adhering to each other or to the kiln furniture, as the molten glaze on the tableware and pottery solidifies. These articles must be sufficiently refractory to support the weight of the ware without softening under the maximum heat attained in the kiln.

U.S. tariff treatment

The articles considered here are free of duty under item 531.31 of the TSUS.

Comment

The value of domestic consumption of the articles considered here is estimated to have been between $500 thousand and $1 million annually during the years 1966-70. Domestic production has supplied between 95 and 99 percent of annual consumption. Two manufacturers located in Ohio produce virtually all of the domestic output. Over 99 percent of domestic consumption is accounted for by the commercial dinnerware and pottery industry, the remainder being used by hobbyists.

Exports, principally to Mexico and Canada, are not separately reported but probably amounted to less than $100,000 annually during 1966-70.

PINS, SPURS, STILTS, AND THIMBLES USED IN THE MANUFACTURE OF CERAMIC ARTICLES

Imports of pins, spurs, stilts and thimbles decreased from about 11,000 pieces, valued at $5,297 in 1966, principally from West Germany, to 390 pieces, valued at $1,078 in 1969, all from Japan (see following table). Imports, principally from Mexico subsequently increased to 1,024 pieces, valued at $1,067 in 1970.

Pins, spurs, stilts, and thimbles: U.S. imports for consumption, by principal sources, 1966-70

Country	1966	1967	1968	1969	1970
	Quantity (number)				
Mexico	-	-	-	-	800
Japan	-	2,046	1,247	390	-
West Germany	10,803	-	-	-	-
Canada	240	-	-	-	-
All other	41	-	-	-	1/ 224
Total	11,084	2,046	1,247	390	1,024
	Value				
Mexico	-	-	-	-	$400
Japan	-	$3,767	$1,608	$1078	-
West Germany	$1,010	-	-	-	-
Canada	3,760	-	-	-	-
All other	527	-	-	-	1/ 667
Total	5,297	3,767	1,608	1,078	1,067

1/ All from Italy.

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

REFRACTORY CRUCIBLES AND REFRACTORY ARTICLES, NOT ELSEWHERE ENUMERATED

Commodity	TSUS item
Earthenware and stoneware crucibles----	531.35
Refractory articles, not elsewhere enumerated----------	531.37-.39

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

Consumption of refractory crucibles and other refractory and heat-insulating articles is estimated to be about $55 million annually. The United States relies almost exclusively on domestic sources. Exports are probably 3 to 4 times greater than imports.

Description and uses

This summary covers ceramic shaped refractory and heat-insulating articles made from clay and non-clay materials. Refractory and heat-insulating bricks and shapes, mortars, ramming mixes, castables, and powders (items 531.01 to 531.27) are covered in other summaries in this volume. Carbon and graphite crucibles (item 531.33) are covered in summaries volume 5:1.

For tariff purposes, heat-insulating articles are those having a bulk density of not over 75 pounds per cubic foot and designed to impede or resist the flow of heat above 1600° F. Refractory articles are those having a bulk density of over 75 pounds per cubic foot and designed to resist temperatures above 2600°. Shaped refractory articles have special properties of strength and resistance to thermal shock and may have such other properties as resistance to abrasion and corrosion.

REFRACTORY CRUCIBLES AND REFRACTORY ARTICLES, NOT ELSEWHERE ENUMERATED

Ceramic refractories and heat-insulating articles are made from a variety of materials with a wide range of properties. The principal materials used to make such articles are fireclay, mullite, alumina, cordierite, silicon carbide, carbon and graphite, and zircon and zirconia. Fireclay, one of the oldest materials used to make refractory and heat-insulating articles, is the most commonly used material; mullite is used in relatively low heat applications where silica contamination is not a problem. Alumina is used for higher temperature applications; cordierite, where good thermal shock resistance is required; and silicon carbide, where high temperature strength is required. Carbon and graphite refractories (other than crucibles) are used where a high strength to weight ratio is essential and high thermal and electrical conductivity are required. Zircon and zirconia, the most refractory of the commonly used materials, are used where resistance to slag and low coefficient of expansion are required.

Earthenware and stoneware 1/ crucibles are used in assaying and other metallurgical processes. Porcelain and subporcelain 1/ refractory articles include such items as strainers, cores, pouring tubes, thermocouple protective tubes, and heating element cores and plates. The refractory and heat-insulating articles of other ceramic materials include crucibles and coatings and linings for crucibles, retorts, reaction vessels, burner jets, and saggers, perforated grids, setter slabs and other kiln furniture to support and separate pottery during firing.

1/ See applicable definitions contained in headnote 2, part 2, schedule 5 of the TSUSA-1971 in appendix A to this volume.

REFRACTORY CRUCIBLES AND REFRACTORY ARTICLES, NOT ELSEWHERE ENUMERATED

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Shaped refractory and heat-insulating articles not specially provided for, and structures of refractory or heat-insulating articles:			
531.35	Earthenware and stoneware crucibles-----	10% ad val.	6% ad val.	5% ad val.
531.37	Porcelain and subporcelain articles 1/---	36% ad val. 2/	3/	3/
531.39	Other----------	15% ad val.	9% ad val.	7.5% ad val.

1/ Effective Dec. 7, 1965, the article was amended by the Tariff Schedules Technical Amendments Act of 1965 (Publication 89-241) to include subporcelain refractory articles.

2/ This rate was reduced from 45% ad valorem, the rate established by the TSUS, to 40% ad valorem, effective May 1, 1966, and to 36% ad valorem, effective May 1, 1967, by Presidential Proclamations 3712 and 3818, respectively, dated April 5, 1966 and Nov. 6, 1967. It was further reduced to 31% ad valorem on May 1, 1968, to 27% ad valorem on May 1, 1969, and to 22.5% ad valorem on May 1, 1970, by authority of the above noted Presidential Proclamations.

3/ Rate of duty not affected by trade conference.

REFRACTORY CRUCIBLES AND REFRACTORY ARTICLES, NOT ELSEWHERE ENUMERATED

For items 531.35 and 531.39, the rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from concessions granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. These concessions amount to total reductions of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

Comment

The value of consumption of shaped refractories and heat-insulating articles is estimated to be about $55 million annually in recent years. Due to improved processing techniques which require smaller amounts of these articles and the improved quality of the refractory and heat-insulating articles, consumption of these articles has not shown any significant growth. The metal processing and glass industries are the principal consumers; the ceramic industry normally consumes less than 20 percent of the total. Most of these articles are produced and consumed in the northeastern and north central sections of the United States.

Shaped refractory and heat-insulating articles were produced by about 50 firms, most of which either produced other refractory articles or industrial ceramic articles. Exports, which were not reported separately, probably amounted in value to between $3 and $4 million in recent years.

Annual imports, in recent years, have amounted to less than 2 percent of estimated annual domestic production. They decreased from $1.4 million in 1966 to $1.1 million in 1968, increased to $1.7 million in 1969, but then again declined to $1.3 million in 1970 (see following table). Imports of earthenware and stoneware crucibles, principally from the United Kingdom, accounted for less than 1 percent of annual imports; those of porcelain and subporcelain refractory articles, principally from the United Kingdom, accounted for about 10 percent of annual imports. France, West Germany, Sweden, and the United Kingdom were the principal suppliers of the other refractory and heat-insulating articles, the imports of which consisted principally of perforated grids, setter slabs, and other kiln furniture, shaped graphite articles, silicon carbide tubes, and shaped refractory blocks.

Shaped refractory and heat insulating articles, not elsewhere enumerated: U.S. imports for consumption, by principal sources, 1966-70

(In thousands of dollars)

Country	1966	1967	1968	1969	1970
Sweden	422	210	346	469	309
France	562	324	501	294	291
United Kingdom	161	185	147	287	259
West Germany	188	411	9	96	115
Italy	19	43	74	57	16
All other	94	18	59	1/ 462	309
Total	1,446	1,191	1,136	1,665	1,299

1/ Includes imports, valued at $163 thousand, from Canada, and imports, valued at $162 thousand, from Japan.

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

Commodity	TSUS item
Ceramic brick:	
Common and face	532.11
Glazed	532.14

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

U.S. imports and exports of ceramic construction brick, confined principally to two-way trade with Canada and imports from Mexico, have been small in relation to domestic shipments, which amounted to about 6.6 billion brick in 1970. However, in terms of quantity, estimated imports as a percent of domestic shipments rose from an average of 0.5 percent in 1958-62 to about 2.0 percent in 1970. In the latter year, imports are estimated to have been 8 times larger than exports.

Description and uses

Uncoated ceramic structural building brick (item 532.11) comprise two principal types: (1) common or building brick, constituting any clay- or ceramic-base brick used primarily for building purposes and not specially treated for texture or color; and (2) face brick, made of selected clays or otherwise treated to produce desired color, and often treated to produce surface texture. Other types of building brick include paving, flooring, and sewer brick. Among the properties influencing the choice of brick for a given use are weathering ability, color, texture, size variation, absorption, and compressive strength.

Coated (usually called "glazed") ceramic structural building brick (item 532.14) are brick which are glazed on at least one side with a ceramic composition to improve their appearance and/or weathering properties.

Common, face, and glazed brick are used largely in the construction of residential and small nonresidential buildings. Common and face brick are by far the most extensively used products, filling most construction needs at a lower cost than the glazed brick.

Much of the brick imported from Mexico does not meet the specifications for ceramic articles as defined in the Tariff Schedules of the United States. 1/

1/ See headnote 2(a), part 2, schedule 5, TSUSA-1971, reproduced in appendix A of this volume.

These imports of lower quality brick, however, were entered and reported for statistical purposes as ceramic brick from August 31, 1963, until 1965. In that year the Bureau of Customs issued a binding ruling (T.D. 56551 (18)) that such brick were properly classifiable under items 523.91 and 523.94 as "other articles of mineral substances, not specially provided for." The Customs Court in C.D. 3898 overruled a protest that these non-ceramic brick were classifiable under item 532.11, but did not rule directly on their proper classification. The Customs Bureau continues to follow C.D. 56551 (18).

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA 1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Ceramic bricks:			
532.11	Not coated in whole or in part with engobe, glaze, or enamel	50¢ per 1,000	10¢ per 1,000	Free
532.14	Coated in whole or in part with engobe, glaze, or enamel	6% ad val.	3.5% ad val.	3% ad val.

The rates in effect prior to January 1, 1968, had remained unchanged from August 31, 1963 (the effective date of the TSUS), through 1967. The fourth and final stages show two of the five annual rate modifications resulting from concessions granted by the United States in the sixth round of tariff negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. These concessions amount to a total reduction of 50 percent on item 532.14 and elimination of the duty on item 532.11 (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for the staged rates).

For item 532.11, the ad valorem equivalent of the duty in 1970, based on officially tabulated imports in 1970, was 0.5 percent.

U.S. consumption and production

Estimated consumption (approximately equivalent to production) of unglazed common and face brick increased in each of the years 1962-65 to a record high of 8.2 billion brick, valued at more than $300 million in 1965 (table 1).

Since 1965, annual consumption has fluctuated at levels 5 to 15 percent below the apparent domestic use in 1965.

A close correlation usually exists between the value of common and face brick consumption and the value of construction of new residential and nonresidential buildings, with such brick accounting for about 0.6 percent of such construction value. This ratio has, however, been declining since the end of World War II.

Data are not available on the consumption and production of glazed brick. Industry sources indicate that the use of glazed brick in homes and store fronts has declined in recent years in a highly competitive market area where particularly face brick and some non-brick materials have been increasingly used. It is estimated that the value of annual consumption of glazed brick was in the range of from $12 to $15 million during 1964-69, compared with $15 to $18 million in the early 1960's.

U.S. producers

In 1970, 400 to 450 plants in the United States produced common and face brick; this represented a considerable decline in producing units since 1939, when some 800 brick plants were in operation. Employment in the industry also has declined moderately, to about 21,000 production workers. Plants producing common and face brick almost always specialize in those products, with generally less than 10 percent of the value of their total shipments represented by structural clay tile, unglazed facing tile, drain tile, and (in some instances) glazed brick.

Common and face brick are produced in nearly all of the States, largely from locally available clays. In most years North Carolina has been the leading producer, in terms of quantity, and Ohio, in terms of total value, with Texas and Pennsylvania following. About two-thirds of the total production of common and face brick is accounted for by the 10 largest producing States. Most manufacturers operate only 1 or 2 plants; some, however, produce brick at 5 to 22 plants located in several States.

Glazed brick were produced by some 15 companies at about 25 plants located in a dozen States, primarily Ohio, Pennsylvania, and Texas.

Most of these plants also produced structural hollow tile. About 2,500 production workers were employed in plants producing glazed brick and structural hollow tile as primary products.

Many plants producing common, face, or glazed brick have increased their efficiency in recent years by greater knowledge of raw materials, better control of kiln burning conditions, improved kiln design, and increased mechanization.

U.S. exports

During 1965-69, annual U.S. exports of common and face brick (the two types combined in a single export class) varied, increasing from 20.7 million units, valued at $1.3 million in 1965 to 22.7 million units, valued at $1.4 million in 1969, but then declining to 16.7 million units, valued at $1.1 million in 1970 (table 1). For several years prior to 1965, a single classification accounted for exports of glazed brick together with common and face types; however, it is believed that actual exports under this class have long consisted of common and face brick.

Exports of common and face brick have always been small relative to domestic production--less than 1 percent in recent years compared with somewhat more than that a decade ago. The bulk of these exports are shipped from U.S. plants located near the north border to nearby cities or other populous areas in Canada.

Since 1964, data on U.S. exports of glazed brick have been combined with data on structural hollow tile. It is estimated that annual exports of glazed brick, largely shipped to Canada, are within the value range of $300,000 to $500,000.

U.S. imports

Official statistics on imports of common and face brick (as shown in table 1) greatly understate total brick imports because many entries from Mexico are of such low value that they have not been included in official statistics. Most of these low-value, informal entry shipments consist of 2,000 to 10,000 brick having a value of from $30 to $200 per entry. Industry sources estimate that these low-value shipments from Mexico amounted to 30 to 40 million brick, valued at $750 thousand to $1 million, each year during 1958-62, and that by 1964 the volume of such shipments through Texas customs districts had reached more than 100 million brick, valued at about $2 million. It is believed that such imports declined moderately in 1965-70. Imports of common and face brick, including estimates of the low-value shipments, represented average annual shares of domestic shipments of 0.5 percent during 1958-62, 1.2 percent in 1964, and 2.0 percent in 1970.

In 1965, the U.S. Customs Bureau issued a ruling that certain construction brick from Mexico were properly classifiable under TSUS item numbers 523.91 or 523.94 because they did not meet the definition of "ceramic" in headnote 2(a) of part 2, schedule 5, Tariff Schedules of the United States. 1/ Brick classified under item 523.91, not decorated, are dutiable at 9 percent ad valorem; for item 523.94, decorated, the tariff rate is 16.5 percent ad valorem.

Official statistics on imports of glazed brick reported an average of about 8 million brick, valued at nearly $150,000, annually, between 1958 and 1962. Officially reported imports of these brick dropped from 900,000 units in 1963 to 72,000 brick, valued at $3,000 in 1965, and remained at the latter value level in 1966-70 (table 2). Glazed brick have entered from Mexico in low-value shipments but at a considerably lower volume than common and face brick. The Bureau of the Census estimated that over 6 million glazed brick, valued at about $130 thousand, were imported from Mexico through Texas customs districts in 1963. Imports of such glazed brick are believed to have decreased considerably in the past 3 years.

According to trade sources, the primary markets for imported Mexican common, face, and glazed brick are the border States, principally Texas, but sales have been reported as distant as Denver and Chicago. Most brick from Mexico are priced competitively with the lowest-quality domestic product and are usually used in types of construction where long weathering characteristics and rigid specifications are not important factors, or where purchasers may not be fully aware of the quality shortcomings of part of the imported product.

1/ See pertinent section of the TSUSA (1971), reproduced in appendix A to this volume.

Table 1.--Unglazed building brick (common and face): U.S. production, imports for consumption, exports of domestic merchandise, and estimated apparent consumption, 1965-70.

Year	Production 1/	Imports 2/ 3/	Exports	Estimated apparent consumption
	Quantity (1,000 bricks)			
1965	8,089,100	14,506	20,750	8,170,000
1966	7,551,700	13,672	20,386	7,630,000
1967	7,117,400	13,764	19,195	7,190,000
1968	7,556,800	17,477	21,722	7,560,000
1969	7,289,669	36,405	22,685	7,310,000
1970	6,493,868	62,892	16,670	6,615,000
	Value (1,000 dollars)			
1965	301,000	848	1,339	302,400
1966	289,500	999	1,238	291,000
1967	285,600	1,009	1,174	287,000
1968	318,400	1,519	1,308	318,700
1969	318,892	1,695	1,425	319,300
1970	287,568	2,716	1,077	290,700

1/ Reported in units of a standard brick, 8 x 4 x 2 inches in size.

2/ Excludes data on informal entries of small-value shipments, nearly all from Mexico. It is estimated that such imports increased steadily through 1964, in which year they approximated 100 million brick, valued at $2.0 million. Since 1964, such imports are believed to have declined to an annual level of about 75 million brick, valued at $1.5 million.

3/ Excludes data on imports of low-quality brick from Mexico; i.e., the type of brick which does not meet the definition of "ceramic" in headnote 2(a), part 2, Schedule 5, TSUSA. It is estimated that such unreported brick was imported at an annual rate of approximately 8 to 10 million units, valued at more than $100 thousand.

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

Note.--The statistical anomalies described in the footnotes have been taken into account in arriving at estimated apparent consumption.

Table 2.--Ceramic brick, glazed: U.S. imports for consumption, 1965-70 1/

Year	Quantity	Value
	1,000 bricks	1,000 dollars
1965	72	3
1966	26	3
1967	21	2
1968	23	2
1969	48	3
1970	28	3

1/ Official import statistics do not include informal entries of small-value shipments, nearly all from Mexico.

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

Commodity	TSUS item
Ceramic floor and wall tiles	532.21, 532.24

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA 1971).

U.S. trade position

U.S. consumption of ceramic floor and wall tiles 1/ during the period 1966-70 averaged 373 million square feet annually; wall tile accounted for nearly 75 percent of the total. Imports during this period accounted for an average of 35 percent of consumption; exports were negligible.

Description and uses

The U.S. tariff schedules, in agreement with industry practice, distinguish three major types of ceramic floor and wall tile: Unglazed or glazed mosaic tile (tile having a facial area of less than 6 square inches); 2/ glazed "wall" tile (glazed tile having a facial area of 6 square inches or more); and quarry and other paving tile (unglazed tile having a facial area of 6 square inches or more). Quarry and other paving tile (item 532.27) are covered in another summary in this volume.

Mosaic tiles, which are generally about one-quarter inch in thickness, are produced in rectangular shapes and fitted together to form various designs. The colors of glazed mosaic tile are put into the glaze coating, whereas the colors of unglazed mosaic tile are mixed throughout the body of the tile. In recent years the demand for mosaic tile in many colors and textures has increased, requiring more glazed mosaic tile, which lends itself to more pleasing variations than does the unglazed. Nearly all mosaic tile is sold mounted in patterns on sheets usually 1 x 2 feet. Mosaic tile is either "face mounted", i.e., mounted on paper cemented to the face of the tile with a water-soluble adhesive, or "back-mounted," i.e., mounted permanently on material cemented to the back of the tile. Back-mounted tile, which comprises the greater part of mosaic tile consumed, is usually more expensive than is the face-mounted tile, because its production requires costlier mounting materials and more labor. Nevertheless, the cost saving--which back-mounted tile affords the contractor when installing the tile--generally exceeds the additional cost of the tile itself.

1/ The term "floor and wall tile" as used in this summary means glazed and unglazed mosaic tile and glazed wall tile.

2/ Additional information on the maximum size of mosaic tile may be found on page 82, Sched. 5 volume of the Tariff Classification Study (1960).

Ceramic wall tile, which is nearly always installed singly, is usually about 5/16-inch thick and 4-1/4 inches square.

Nearly all ceramic mosaic tile and glazed wall tile consumed in the United States is installed in building construction as a surfacing material, for floors, or interior or exterior walls, counter tops, columns, and other building parts. Ceramic mosaic tile is used primarily as a floor-surfacing material where resistance to wear and/or moisture is important. In recent years, however, such tile has had increased use on bathroom walls as a replacement for wall tile and on interior and exterior walls as a medium of architectural expression. Wall tile is limited to interior use--mainly on walls; recently, however, crystalline-glazed wall tile has been used in substantial amounts on residential bathroom floors.

Ceramic mosaic tile and glazed wall tile compete not only with one another but also with non-ceramic materials. The chief non-ceramic materials that compete with ceramic mosaic tile are homogeneous vinyl and vinyl asbestos tile (items 728.25 and 772.70) discussed in summaries volume 7:7. The chief alternatives to wall tile are waterproof fabric and paper included in the wallpaper summary covering item 256.05 in volume 2:4, and enamel paints (items 474.30-.35) discussed in summaries volume 4:10. Although all of these products are less expensive than the ceramic tile, ceramic tile is the more durable. The introduction of new patterns and glaze effects, moreover, has contributed materially to making ceramic tile competitive with alternative materials.

U.S. tariff treatment

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Ceramic tiles:			
	Floor and wall tiles:			
532.21	Mosaic tiles---	24.5% ad val.	1/	1/
	Other:			
532.24	Glazed-------	22.5% ad val.	1/	1/

1/ Rate of duty not affected by trade conference.

The rates of duty have been in effect since August 31, 1963. The official statutory rate (which is applicable to imports from Communist-dominated countries) is 55 percent ad valorem on both items covered in this summary.

Since 1959 the Tariff Commission has conducted several investigations of ceramic floor and wall tile, including an escape-clause, under section 7 of the Trade Agreements Extension Act of 1951; three worker-assistance under the provisions of the Trade Expansion Act (TEA) of 1962; one firm-assistance under the TEA of 1962; one section-332 under the provisions of the Tariff Act of 1930, as amended; and one antidumping under the Antidumping Act of 1921, as amended. The escape-clause investigation resulted in a finding of injury; the President, however, took no action. The firm-and worker-assistance investigations all resulted in negative findings by the Tariff Commission. The section 332 investigation was eventually placed in an inactive status, and no public report was issued. The antidumping investigation resulted in an injury finding against ceramic wall tile imports from the United Kingdom and was referred to the Treasury Department for collection of dumping duties.

U.S. consumption

Annual domestic consumption of ceramic floor and wall tile during 1966-70 averaged 373 million square feet compared with an average of 344 million square feet during the previous 5-year period. Consumption during 1966-70 ranged from a low of 336 million square feet in 1970 to a high of 413 million square feet in 1969 (table 1).

Annual consumption of ceramic mosaic tile during 1966-70 averaged 93 million square feet, compared with an average of 85 million square feet during the period 1961-65. Consumption during 1966-70 ranged from a low of 79 million square feet in 1970 to a high of 111 million square feet in 1969 (table 2). Average annual consumption of glazed mosaic tile showed a marked increase from 28 million square feet during 1960-64 to 52 million square feet during 1965-69, conversely, annual consumption of unglazed mosaic tile declined moderately from an average of 50 million square feet during 1960-64 to 46 million square feet during 1965-69. Consumption of glazed wall tile, which accounted for about 75 percent of the annual consumption of ceramic floor and wall tile, averaged 279 million square feet annually during 1966-70, compared with an average of 258 million square feet during 1961-65. Annual consumption during 1966-70 ranged from a low of 256 million square feet in 1970 to a high of 302 million square feet in 1969.

The marked increase in the consumption of glazed mosaic tile reflected the greatly increased importation from Japan of such tile in a wide variety of sizes, shapes, and glaze effects, many of which were unlike any made in the United States. The popularity of this tile stemmed

from the decorative effect of its architectural application and its relatively low price. In 1965, domestic production supplied 66 percent of the unglazed mosaic tile consumed, 8 percent of the glazed mosaic tile, and 76 percent of the glazed wall tile. In 1969, domestic production supplied 72 percent of the unglazed mosaic tile consumed, 5 percent of the glazed mosaic tile, and 72 percent of the glazed wall tile.

Competition between imported and domestic floor and wall tile has been most intense in the larger East Coast metropolitan areas, although both kinds have also competed strongly in other large metropolitan areas. Nearly 40 percent of the domestic tile and about 80 percent of the imported tile were sold in 25 metropolitan areas. These 25 areas accounted for about half of all floor and wall tile consumed in the United States. Outside of the 25 areas, 86 percent of floor and wall tile consumed was domestic and 14 percent was imported.

The lowest prices for domestic tile and for imported tile generally were in the areas of most intense competition--in the East Coast metropolitan areas; prices were generally highest in the inland areas and in California.

During 1963-66, the national average price paid by contractors and distributors for domestic mosaic tile was substantially higher than for similar imported mosaic tile, and the average price differential increased during the period. The average price paid for domestic wall tile was also higher than that paid for similar imported wall tile; however, the price differential was smaller than that for mosaic tile and it decreased during the period 1963-66.

Major developments that have affected the consumption of ceramic floor and wall tile include the development in the mid-1950's of thin-set cement and improved mastics for installing tile, which reduced the cost of installation; the increased use of ceramic tile as an architectural medium; the continued strong competition from improved alternative materials for surfacing floors and walls; and the greatly increased importation of ceramic floor and wall tile, particularly from Japan.

U.S. producers

In 1967, 34 U.S. firms manufactured ceramic floor and wall tile in 54 plants. Five firms produced both mosaic tile and wall tile, 25 produced only wall tile, and four produced only mosaic tile. In recent years, production of ceramic tile was discontinued at 22 plants operated by 17 firms; also four ceramic tile producers put into operation four newly-built wall tile plants, one of which ceased production in 1967. The net effect was a decrease in the capacity to produce mosaic tile

and an increase in the capacity to produce wall tile. In 1967, six firms, 1/ operating 24 establishments, accounted for 77 percent of the U.S. shipments of mosaic tile and 55 percent of the shipments of wall tile. These firms accounted for 58 percent of the combined U.S. shipments of mosaic and wall tile.

In 1967 mosaic tile was produced by nine firms operating 11 plants located in eight states. Three plants were located in Ohio, two in Pennsylvania, and one each in New York, New Jersey, Arkansas, Texas, Mississippi, and California. In addition, two firms imported bulk mosaic tile and mounted them in plants in Massachusetts and Minnesota. Also in 1967, wall tile was produced by 30 firms, operating 46 plants located in 15 states. Eleven plants were located in California, eight in Texas, six in Ohio, four each in New Jersey and Florida, three in Mississippi, two in Pennsylvania, and one each in Alabama, Tennessee, Kansas, North Carolina, Illinois, Utah, New York, and Massachusetts.

U.S. production (shipments)

During the period 1966-70, annual U.S. shipments of ceramic floor and wall tile fluctuated between 224 and 255 million square feet and averaged 244 million square feet (table 1). Shipments of glazed wall tile accounted for 86 percent of annual shipments in that period.

U.S. shipments of mosaic tile, which ranged between 32 and 36 million square feet annually during 1966-70 (table 2), averaged 34 million square feet, compared with an average of 37 million square feet during the preceding five year period. Shipments of unglazed mosaic tile accounted for 92 percent of annual shipments in the 1965-69 period; shipments of glazed mosaic tile ranged from 2 to 3 million square feet annually.

Domestic shipments of glazed wall tile declined from 217 million square feet in 1966 to 204 million square feet in 1967 before increasing to 219 million square feet in 1969 (table 3). Shipments of glazed wall tile dropped to 192 million square feet in 1970. Shipments averaged 209 million square feet during this period, an increase over the average of 204 million square feet during 1961-65.

In 1967, the eight largest wall tile firms operating 21 plants accounted for 73 percent of the total quantity and 72 percent of the total value of wall tile shipped. Six of the eight largest firms were multi-plant firms.

1/ Includes one firm that imports unmounted mosaic tile and mounts the tile in the United States.

U.S. exports and imports

Exports of ceramic floor and wall tile have been relatively small for many years, and since 1960 have been less than 1 percent of domestic production. Exports have amounted to less than 1 million square feet annually since 1966.

Before 1955, imports of ceramic floor and wall tile supplied an insignificant part of U.S. consumption. In the period 1955-70, however, annual imports of such tile increased annually except for declines in 1957, 1966, 1967, and 1970 because of slowdowns in building activities.

In 1969, imported ceramic floor and wall tile supplied the following percentages of U.S. consumption: unglazed mosaic tile, 28 percent; glazed mosaic tile, 95 percent; and glazed wall tile, 28 percent (tables 2 and 3). During the years 1966-70 Japan supplied virtually all the imports of mosaic tile and about 50 to 70 percent of the imports of wall tile. The United Kingdom, Mexico, and Italy supplied most of the remainder of glazed wall tile imports.

Imports of mosaic tile increased from 5 million square feet in 1955 to 65 million square feet in 1964, declined annually through 1967 to 49 million square feet, then increased to 61 million square feet in 1968 and to an all-time high of 75 million square feet in 1969 (table 2). Imports of mosaic tile decreased to 47 million square feet in 1970. During the period 1966-70, imports averaged 59 million square feet annually.

Imports of unglazed mosaic tile, which accounted for 20 percent of the total imports of mosaic tile during 1966-70, declined annually after 1966, from 15 million square feet in that year to 11 million square feet in 1968 before increasing to 13 million square feet in 1969; imports then decreased to 7 million square feet in 1970. Imports of glazed mosaic tile increased annually, except for a moderate decline in 1967, from 48 million square feet in 1966 to 62 million square feet in 1969, then declined to 40 million square feet in 1970.

Imports of glazed wall tile, most of which are comparable with domestic tile, fluctuated irregularly during 1966-70, declining in 1967, 1969 and 1970. Imports of glazed wall tile were at a record high of 86 million square feet in 1968. During 1966-70, annual imports averaged 71 million square feet. The long term upward trend in imports is attributable to improvements in the quality of Japanese tile, the lower price of Japanese tile compared with domestic tile, and to a lesser extent increased imports from the United Kingdom, Mexico, and Italy.

Foreign production and trade

Four countries have been important suppliers of ceramic floor and wall tile to the United States in recent years. The following are comments on the production and trade of ceramic floor and wall tile by Japan, the United Kingdom, Mexico, and Italy.

Japan has a long tradition in the manufacture of ceramic articles, having at least 70 years of experience in the manufacture of ceramic tile. The raw materials necessary to manufacture ceramic tile are readily available in Japan. Although Japan increased production of tile in the decade following World War II, it was not until the 1950's that exports became significant.

In 1966, 49 Japanese firms produced unglazed mosaic tile, 151 produced glazed mosaic tile, and 17 produced glazed wall tile. It is believed that the number of producers of most types of tile increased moderately in 1967-69.

As shown in the following tabulation for 1965-69, Japanese production of glazed mosaic tile increased substantially whereas production of unglazed mosaic tile was irregularly lower in 1967-69 than in the record year, 1966:

(In millions of square feet)

Year and item	Production 1/	Exports 2/		Apparent home market consumption 3/
		To the United States	Total	
Unglazed mosaic:				
1965	95	17	66	29
1966	110	14	56	54
1967	102	10	45	57
1968	89	11	36	53
1969	105	11	34	71
Glazed mosaic:				
1965	156	46	97	59
1966	174	48	114	60
1967	177	37	113	64
1968	197	52	145	52
1969	241	65	193	48
Unglazed plus glazed mosaic:				
1965	251	63	163	88
1966	284	62	170	114
1967	279	47	158	121
1968	286	63	181	105
1969	346	76	227	119

1/ Converted at the rate of 1,000 square feet per metric ton.
2/ Converted at the rate of 10.764 square feet per square meter.
3/ Imports into Japan were negligible.

Source: Production compiled from Japanese industry sources; exports compiled from Japan's Ministry of International Trade and Industry (MITI).

Exports from Japan of unglazed mosaic tile declined steadily during 1964-69 whereas exports of glazed mosaic tile nearly tripled. Although the United States is the largest export market for Japanese mosaic tile, the share of Japanese exports to the United States declined in 1964-69 as new markets, particularly in Europe, were developed.

As shown in the following tabulation, Japanese production of glazed wall tile increased sharply in 1964-69, as did home market consumption; exports, however, were considerably lower after 1966:

(In millions of square feet)

Year	Production 1/	Exports 1/		Apparent home market consumption 2/
		To the United States	Total	
1964	157	43	71	86
1965	179	45	83	96
1966	201	34	85	116
1967	198	32	72	126
1968	215	37	74	141
1969	244	29	71	173

1/ Converted at the rate of 878 square feet per metric ton.
2/ Imports into Japan were negligible.

Source: Production compiled from Japanese Industry sources; exports compiled from Japan's Ministry of International Trade and Industry (MITI).

The United Kingdom for many years has been a major producer of ceramic wall tile. Mosaic tile production, however, has been minor and in recent years such production has virtually ceased. Some half-dozen firms, operating about 10 plants, produce annually well over 100 million square feet of wall tile. Three of these firms account for most sales.

The United Kingdom is a net exporter of very sizable quantities of wall tile and a net importer of mosaic tile. Imports of wall tile represent only a very small percentage of domestic consumption while imports of mosaic tile represent more than 90 percent of apparent consumption.

Mexico for many years has been a net exporter of ceramic tile. Imports of tile into Mexico have been virtually non-existent and have consisted mainly of small quantities shipped from the United States. A few relatively large firms account for the great bulk of ceramic tile production in Mexico. Most of the production of these plants is wall tile. Accurate production or sales data are not available but it is believed that sales have increased in recent years.

Virtually all Mexican exports, nearly all of which are wall tile, are to the United States. Exports are usually of two types--that which is similar to most of the wall tile sold in the United States, and the remainder of which is highly decorative wall tile of a type unique with Mexico.

Italy has been one of the largest producers in the world of ceramic tile of all types. Annual sales by upwards of 200 firms manufacturing all types of ceramic tile are believed to be nearly a billion square feet, valued at possibly $120 million. Separate data are not available to show the production of glazed and unglazed mosaic tile, wall tile and other tile.

Italy is a net exporter of both glazed and unglazed mosaic tile and wall tile. Most of the glazed mosaic tile and some of the wall tile exported to the United States is highly decorative. A sizable percentage of total exports of unglazed mosaic wall tile are shipped to France and Switzerland, while West Germany and France combined account for some two-thirds of Italian glazed floor and wall tile exports.

Table 1.--Ceramic floor and wall tile (except quarry tile): U.S. factory shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

(In millions of square feet)

Year	Shipments	Imports	Exports	Apparent consumption	Ratio (percent) of imports to consumption
1965	1/ 263	136	1	398	34
1966	1/ 252	127	1	378	34
1967	1/ 238	2/ 105	1	342	31
1968	249	2/ 147	1	395	37
1969	255	3/ 159	1	413	38
1970	224	3/ 113	1	336	34

1/ Data compiled from reports to the Tariff Commission by domestic producers.

2/ Data adjusted to compensate for incorrect quantities reported for the imports from Italy.

3/ Adjusted; subject to revision.

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

Table 2.--Ceramic mosaic tile (glazed and unglazed): U.S. factory shipments, imports for consumption, and apparent consumption, 1965-70

(In millions of square feet)

Year	Shipments	Imports 1/	Apparent consumption	Ratio (percent) of imports to consumption
	Unglazed			
1965	2/ 33	17	50	34
1966	2/ 32	15	47	32
1967	2/ 32	12	44	27
1968	32	11	43	26
1969	33	13	46	28
1970	3/	7	4/	4/
	Glazed			
1965	2/ 4	47	51	92
1966	2/ 3	48	51	94
1967	2/ 2	37	39	95
1968	2	50	52	96
1969	3	62	65	95
1970	3/	40	4/	4/
	Total, unglazed and glazed			
1965	2/ 37	64	101	63
1966	2/ 35	63	98	64
1967	2/ 34	49	83	59
1968	34	61	95	64
1969	36	75	111	68
1970	32	47	79	59

1/ Virtually all from Japan.
2/ Data compiled from reports to the Tariff Commission by domestic producers.
3/ Not separately reported.
4/ Not available.

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

Note.--Exports, not shown in this table, were very small during 1965-70.

Table 3.--Glazed ceramic wall tile (except mosaic): U.S. factory shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1965-70

(In millions of square feet)

Year	Shipments	Imports	Exports	Apparent consumption	Ratio (percent) of imports to consumption
1965	1/ 226	72	1	297	24
1966	1/ 217	64	1	280	23
1967	1/ 204	2/ 56	1	259	21
1968	215	2/ 86	1	300	29
1969	219	3/ 84	1	302	28
1970	192	3/ 66	1	256	26

1/ Data compiled from reports to the Tariff Commission by domestic producers.

2/ Data adjusted to compensate for incorrect quantities reported for the imports from Italy.

3/ Adjusted; subject to revision.

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

Table 4.--Glazed ceramic wall tile (except mosaic): U.S. imports for consumption, by principal sources, 1965-70

Year	Japan	United Kingdom	Mexico	Italy	All Other	Total
	Quantity (1,000 square feet)					
1965	50,702	7,050	9,811	3,316	660	71,539
1966	43,555	8,414	9,211	2,076	440	63,696
1967	35,062	8,520	9,021	1/ 2,803	538	1/ 55,944
1968	48,251	18,535	12,244	1/ 3,963	2,870	1/ 85,863
1969	41,151	20,287	11,315	2/ 4,776	6,763	2/ 84,292
1970	32,848	13,654	6,876	6,302	2/ 6,144	2/ 65,824
	Foreign value (1,000 dollars)					
1965	9,460	1,904	2,743	735	227	15,069
1966	8,358	2,293	2,634	667	208	14,160
1967	6,982	2,218	2,519	786	273	12,778
1968	10,357	4,399	3,527	972	537	19,792
1969	9,494	5,138	3,655	1,250	1,237	20,774
1970	7,777	3,428	2,299	1,644	1,269	16,417
	Unit value (cents per square foot)					
1965	18.7	27.0	28.0	22.2	34.4	21.1
1966	19.2	27.3	28.6	32.1	47.3	22.2
1967	19.9	26.0	27.9	1/ 28.0	50.7	1/ 22.8
1968	21.5	23.7	28.8	1/ 24.5	18.7	1/ 23.0
1969	23.1	25.3	32.3	2/ 26.2	18.3	2/ 24.6
1970	23.7	25.1	33.4	26.1	2/ 20.7	2/ 24.9

1/ Data adjusted to compensate for incorrect quantities reported for the imports from Italy.

2/ Adjusted; subject to revision.

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

CERAMIC FLOOR AND WALL TILE, UNGLAZED, EXCEPT MOSAIC TILE

Commodity	TSUS item
Ceramic floor and wall tile, unglazed, except mosaic tile	532.27

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

Annual U.S. consumption of the ceramic tile covered in this summary averaged about 30 million square feet during the period 1966-70. Imports amounted to about 16 percent of consumption and were about 4 to 5 times larger than exports.

Description and uses

Ceramic floor and wall tile other than mosaic tile, hereafter referred to as quarry and other paving tile, consist of unglazed ceramic flat pieces less than 1.25 inches in thickness. These tiles, are usually vitrified and made in 4-inch and 6-inch squares; however, such tiles are produced in smaller or larger sizes. More recently, decorative shapes have been produced which are generally more than 5/8-inch thick and made from red-burning natural clays, similar to those used in ceramic drain tile.

The individual tiles are rugged and suitable for use in heavy-duty floors of commercial kitchens and factories, or of outdoor areas. Some of the more decorative shapes, however, are used in the home and other light-traffic areas.

Ceramic mosaic and glazed wall tile are covered in another summary in this volume; cement tile is covered in item 511.31, summaries, volume 5:1.

CERAMIC FLOOR AND WALL TILE, UNGLAZED, EXCEPT MOSAIC TILE

U.S. tariff treatment

The column 1 (or trade-agreement) rate of duty applicable to imports (see general headnote 3 in the TSUSA-1971) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth-stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Ceramic tiles:			
	Floor and wall tiles:			
	Other:			
532.27	Other (than mosaic or glazed)	24% ad val. 1/	2/	2/

1/ Rate has been in effect since August 31, 1963.
2/ Rate of duty not affected by trade conference.

Comment

Estimated annual consumption of quarry and other paving tile decreased from 29 million square feet in 1966 to 27 million square feet in 1967, increased to 34 million square feet in 1969, then decreased to an estimated 32 million square feet in 1970. In terms of value, estimated annual consumption increased steadily from $12 million in 1966 to $15 million in 1969, then declined to $14 million in 1970. Domestic production of such tile supplied from 85 to 91 percent of annual consumption.

Annual domestic shipments decreased from 25.9 million square feet in 1966 to 24.8 million square feet in 1967, then increased to 28.8 million square feet in 1969, but declined to 27.3 million square feet in 1970 (see following table). In terms of value, shipments increased from $11.3 million in 1966 to $14.5 million in 1969, then declined to $13.6 million in 1970. The increase in value in 1966-69 was accounted for by increasing prices of the common lines of tiles and the increasing importance of the higher-priced, more decorative tile. The decline in 1970 shipments was accounted for largely by decreased construction activities in that year.

CERAMIC FLOOR AND WALL TILE, UNGLAZED, EXCEPT MOSAIC TILE

Domestic quarry and other paving tile was produced by 11 companies operating 13 establishments in 1968. About half of the plants were operated by producers of complementary lines of ceramic mosaic tile and glazed wall tile.

Although exports of quarry and other paving tile are not separately reported, annual exports probably amounted to about 1 million square feet.

Imports of quarry and other paving tile increased irregularly from 4.5 million square feet, valued at $875,000 in 1966 to 5.8 million square feet, valued at $1.2 million in 1969 (see following table), then declined moderately in 1970. Italy was the most important source of imports accounting for 35 percent of the quantity and the value in 1966-70. Other important sources have been Japan, Mexico, West Germany, and the United Kingdom.

CERAMIC FLOOR AND WALL TILE, UNGLAZED, EXCEPT MOSAIC TILE

Ceramic floor and wall tile, unglazed, except mosaic tile: U.S. factory shipments and imports for consumption by principal sources, 1966-70

Year	Shipments	Imports					
		Total	Italy	West Germany	Mexico	United Kingdom	Japan
	Quantity (1,000 square feet)						
1966	25,895	4,459	1,988	496	519	181	848
1967	24,808	3,445	1,295	179	696	160	736
1968	25,620	1/ 5,427	1/ 2,180	433	1,237	398	684
1969	28,843	5,794	1,773	666	1,350	538	847
1970	27,348	5,766	1,412	895	1,657	674	440
	Value (1,000 dollars)						
1966	11,295	875	407	50	70	61	191
1967	11,711	757	285	52	92	91	122
1968	12,206	1,012	375	120	148	90	146
1969	14,487	1,188	360	214	158	126	194
1970	13,582	1,146	306	248	229	176	90

1/ Quantity adjusted to compensate for incorrect quantity reported for imports from Italy.

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

Commodity	TSUS item
Other ceramic tiles, including roofing tile----------	532.31

Note.--For the statutory description see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

During 1966-70, annual domestic consumption and production of other tiles, virtually all of which were clay roofing tile, approximated 4 to 5 million square feet, valued at about $2 million. During the same period, imports averaged 367,000 square feet, valued at $83,000; exports probably were negligible.

Description and uses

The ceramic tiles covered by this summary are almost exclusively clay roofing tile. Ceramic floor and wall tile (items 532.21-.24) and quarry and paving tile (item 532.27) are discussed in other summaries in this volume.

Ceramic roofing tiles are flat or curved pieces (less than 1.25 inches in thickness) of fired clay used as a roof covering. These tile may be glazed or unglazed; the latter, however, predominate. The tiles are made in numerous colors depending on the composition of the clays but they are mostly reddish-brown due to the widespread presence of iron compounds in the raw materials.

Roofing tile is formed in many shapes, but three types predominate and account for virtually all of the trade in such tile as follows: (1) flat or shingle tiles, (2) Spanish tiles (largely of the mission type), and (3) interlocking tiles.

U.S. tariff treatment

The column 1 (trade-agreement) Rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
532.31	Other tiles, including roofing tiles.	27% ad val.	16% ad val.	13.5% ad val.

The rate in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

Comment

Estimated annual consumption and production of clay roofing tile ranged between 4 and 5 million square feet, valued at about $2 million during 1966-70. Both consumption and production declined after the early 1950's largely as a result of competition from other roofing materials, such as composition roofing, and asphalt and asbestos-cement shingles.

Clay roofing tiles were produced by about 10 firms with plants located in California and northeastern United States; California was the single most important producing state. Most of the producers were engaged primarily in the production of clay pipe and other clay construction products; however, two large producers were primarily manufacturers of ceramic floor and wall tile.

Exports of roofing tile, which are not separately reported, probably were negligible.

Imports of "other" tile, including roofing tile, increased in quantity from 163,000 square feet in 1966 to 606,000 square feet, in 1969, then declined to 519,000 square feet in 1970; the value of imports increased from $44,000 in 1966 to $120,000 in 1969, then declined to $107,000 in 1970 (see following table).

Japan, the United Kingdom, Mexico and Spain have been the leading suppliers of imports during the period 1966-70.

Ceramic roofing and miscellaneous tiles: U.S. imports for consumption, by principal sources, 1966-70

Country	1966	1967	1968	1969	1970
	Quantity (1,000 square feet)				
Japan	50	64	52	47	62
Spain	14	38	32	20	198
United Kingdom	31	34	53	245	31
Dominican Republic	15	15	101	66	46
Italy	-	2	46	13	25
Mexico	39	29	58	112	37
Venezuela	-	-	-	86	45
All other	14	8	16	17	75
Total	163	190	358	606	519
	Value (1,000 dollars)				
Japan	14	40	26	22	33
Spain	2	4	4	3	17
United Kingdom	14	13	18	36	12
Dominican Republic	2	2	10	9	9
Italy	-	1	8	9	9
Mexico	6	3	7	17	8
Venezuela	-	-	-	11	3
All other	6	2	8	13	16
Total	44	65	81	120	107

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

FRIEZES, MANTELS, AND OTHER CONSTRUCTION ARTICLES OF CERAMIC TILES

Commodity	TSUS item
Friezes, mantels, and other construction articles of ceramic tiles	532.41

Note.--For the statutory description see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The value of domestic consumption of friezes, mantels and other construction articles 1/ of ceramic tile during 1966-70 is estimated to have ranged from one-fourth to one-half million dollars annually. Exports were negligible, and imports amounted to only a few thousand dollars annually.

Description and uses

This summary covers friezes, mantels, and other construction articles in chief value of ceramic tile. Construction articles made from other ceramic products (item 532.61) are included in another summary in this volume. Smokers', household, and art and ornamental articles of ceramic tile (item 534.21), and ceramic floor, wall, and other tile (items 532.21-.31) are discussed in other summaries in this volume.

Friezes are sculptured or richly ornamental ceramic articles commonly used for their decorative effect in the finishing construction of buildings. Mantels are the finish construction around a fireplace, covering the front and sometimes the two sides of a chimney, and include an ornamental shelf above the fireplace. Other construction tile articles considered here are usually glazed, custom made, and designed to form predetermined patterns or shapes when laid together.

1/ For tariff purposes, the term "construction articles" means ceramic ware and articles of such ware such as, but not limited to, bricks, tiles, friezes, mantels, sewer and drain pipes and fittings therefor, flue linings, and hollow building blocks, chiefly used in the construction of buildings and other structures.

FRIEZES, MANTELS, AND OTHER CONSTRUCTION ARTICLES OF CERAMIC TILES

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
532.41	Friezes, mantels, and other construction articles, all the foregoing, of ceramic tiles.	12.5% ad val.	7% ad val.	6% ad val.

The rate in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of about 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

Comment

Although statistics on consumption, production, and exports of construction articles made from ceramic tile are not reported separately, domestic production of these articles (often custom made for specific jobs) is known to supply the major part of the consumption. Annual consumption ranges from possibly one-fourth to one-half million dollars.

Annual imports declined from $6 thousand in 1966 to $5 thousand in 1967, then were moderately higher in 1968, 1969 and 1970 (see following table). Japan and Italy were the most important suppliers in 1966-70, accounting for seventy percent of the total imports.

FRIEZES, MANTELS, AND OTHER CONSTRUCTION ARTICLES OF CERAMIC TILES

Ceramic tile construction articles: U.S. imports for consumption, by principal sources, 1966-70

(In thousands of dollars)

Country	1966	1967	1968	1969	1970
Italy	2	1	3	-	8
Japan	3	3	3	4	1
Netherlands	-	-	4	1	-
All other	1	1	1	3	1
Total	6	5	11	8	10

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

CERAMIC CONSTRUCTION ARTICLES, NOT ELSEWHERE ENUMERATED

Commodity	TSUS item
Ceramic construction articles not elsewhere enumerated	532.61

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

Domestic production of the various articles covered here is valued in excess of $100 million annually. The value of exports is 2 or 3 times greater than the value of imports; each, however, amounts to less than 1 percent of domestic consumption. High freight costs discourage international trade, except across-the-border shipments to nearby consuming areas in Canada and Mexico.

Description and uses

This summary covers construction articles 1/ made from clay or other ceramic material which are not elsewhere enumerated in the Tariff Schedules of the United States. The principal products included herein are vitrified clay sewer pipe and fittings, non-vitrified drainage pipe and fittings, solid masonry units made from clay, and hollow construction articles referred to in the trade as load or non-load bearing structural clay tile, structural clay floor and facing tile, filter blocks, and flue tile. The term tile in its broadest sense includes not only relatively thin, flat pieces but also hollow articles such as drain tile, flue tile, facing tile, and hollow building blocks. For tariff purposes, no article 1.25 inches or more in thickness shall be regarded as a tile. The specifically named construction articles discussed in other summaries in this volume are structural building brick (items 532.11-.14), ceramic tiles (items 532.21-.31), and construction articles of ceramic tile (item 532.41).

1/ For tariff purposes, the term "construction articles" means ceramic ware and articles of such ware such as, but not limited to, bricks, tiles, friezes, mantels, sewer and drain pipes and fittings therefor, flue linings, and hollow building blocks, chiefly used in the construction of buildings and other structures.

Vitrified clay sewer pipe is used in residential and municipal sewer systems; it competes with concrete pipe, metal pipe, and particularly with asbestos-cement pipe. Non-vitrified clay drainage pipe and tile are used on or near the surface of the soil to facilitate drainage of rain and other superficial waters; such articles compete mainly with precast concrete shapes and cast-in-place concrete conduits. Structural tile are used in load-bearing walls of smaller buildings, in competition with concrete block, clay brick, wood, and other building materials. Facing tile are used for forming exterior surfaces by attachment to a load-bearing wall; such tile compete with asphalt products, asbestos-cement shingles and siding, wood shingles and siding, natural stone, and ceramic tiles.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA 1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concession granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
532.61	Other ceramic construction articles	15% ad. val.	9% ad. val.	7.5% ad val.

The rate in effect prior to January 1, 1968, had remained unchanged from August 31, 1963 (the effective date of the TSUS), through 1967. The fourth and final stages show two of the five annual rate modifications resulting from a concession granted by the United States in the sixth round of tariff negotiations concluded on June 30, 1967, under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for the staged rates).

U.S. consumption

Estimated consumption of the ceramic construction articles covered here ranged in value from $115 million to $135 million annually during the period 1965-70. The value of annual consumption of vitrified clay sewer pipe and fittings is estimated at $100 to $120 million, of structural clay facing tile at about $10 million, of structural clay non-facing (or hollow) tile at about $5 million, and of clay drain tile, clay block, and other such articles at another $5 to $10 million.

U.S. producers

Vitrified clay sewer pipe and fittings were produced by some 30 companies at about 60 plants, located in 22 States in 1970. Production facilities have been consolidated in the past decade; considerably fewer plants operated in 1970 than formerly, although the number of producing firms and producing States had diminished only slightly. Several companies owned 2 or more plants each; the majority of the producers, however, operated only 1 plant. Ohio had the largest number of plants with 16, followed by California with 7, Colorado and Illinois with 4 each, and Indiana, Pennsylvania and Texas with 3 each.

In 1970 structural clay tile were produced, on at least a small scale, by about 80 firms at 180 plants located in some 35 States. The States having the largest number of plants were Iowa, Texas, Indiana, Illinois, Pennsylvania, and Ohio. Most structural clay tile were produced as needed in plants producing mainly common and face brick.

Clay drain tile, clay block, and other ceramic construction articles covered in this summary were produced, along with other products, by many companies manufacturing clay products and other ceramic articles.

U.S. production

U.S. production of vitrified clay sewer pipe and fittings increased more or less regularly through the 1950's, reaching a value of $98 million in 1959. The annual output varied irregularly during the early and middle 1960's, before finishing the decade with strong showings in 1968 and 1969; in the latter year production was valued at a record $121 million. Production in 1970 was slightly lower than in 1966.

The production of unglazed, non-facing structural (hollow) clay tile declined for many years, from a value of $12.7 million in 1954 to $6.6 million in 1962 and to $4.2 million in 1968, before increasing sharply in 1969, to $7 million (table 1). Production of unglazed and salt-glazed structural facing tile declined from a value of $2.2 million in 1962 to $0.5 million in 1970. Annual production of ceramic-glazed structural clay facing tile, on which statistics are not separately reported, also is believed to be decreasing, possibly from a value range of $15 to $18 million in 1953-55 to $12 to $15 million in 1960-62 and to $7 to $9 million in 1968-70.

Official data are not available on the volume of production of clay drain tile, clay block, and the other ceramic construction articles covered by this summary, but it is believed that the production of clay block is increasing.

U.S. exports

Exports of the ceramic construction articles covered in this summary have been fairly small, consisting largely of shipments of structural clay tile and vitrified clay sewer pipe and fittings to nearby countries, and to Vietnam and other countries in which U.S. firms are engaged in construction projects. The general trend of exports of these articles is downward; in 1970, however, they increased sharply to $884,000 (table 2). An important factor limiting international trade in these articles is the high transportation cost relative to value.

U.S. imports

Annual U.S. imports of the ceramic construction articles covered here are usually within the value range of $100 to $200 thousand, and consist largely of clay sewer pipe and clay drain tile from Canada. In 1970, imports were valued at $421,000; the entire increase was accounted for by imports from West Germany.

Table 1.--Vitrified clay sewer pipe and fittings, and structural clay tile (except ceramic-glazed structural clay facing tile): U.S. production, by types, 1/ 1965-70

(In millions of dollars)

Year	Vitrified clay sewer pipe and fittings	Structural clay tile (except facing tile)	Unglazed or salt-glazed structural clay facing tile	Total
1965	103.4	5.1	1.4	108.9
1966	96.7	5.3	1.2	103.2
1967	97.3	4.9	.8	103.0
1968	109.5	4.2	.8	114.5
1969	121.3	7.0	.7	129.0
1970	119.0	6.1	.5	125.6

1/ Official data on the production of ceramic-glazed structural clay facing tile, clay drain tile, clay block, and similar articles covered by this summary are not available.

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

Table 2.--Ceramic construction articles, not elsewhere enumerated: U.S. imports for consumption and exports of domestic merchandise, by principal trade with Canada and total trade, 1965-70

Year	Imports			Exports 1/		
	Canada	All other	Total	Canada	All other	Total
1965	157	28	185	283	166	449
1966	171	11	182	114	361	475
1967	164	7	171	115	403	518
1968	157	5	162	78	273	351
1969	178	14	192	17	362	379
1970	190	231	421	18	866	884

1/ Not completely comparable with imports because data are not available on exports of structural hollow tile.

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

ARTICLES OF COARSE-GRAINED EARTHENWARE OR STONEWARE, SO-CALLED "ROCKINGHAM" EARTHENWARE AND CERAMIC ART AND ORNAMENTAL ARTICLES

Commodity	TSUS item
Articles of coarse-grained earthenware or stoneware	533.11, 534.31
"Rockingham" earthenware	533.14, -.16 534.74, -.76
Ceramic art and ornamental articles	534.11, -.21 534.81-.97

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (1971).

U.S. trade position

U.S. consumption of the articles covered herein was valued at about $98 million in 1967. Imports are believed to have supplied more than one-third of consumption in recent years, while less than 1 percent of U.S. production was exported.

Description and uses

This summary covers a wide variety of articles in chief value of ceramic ware. 1/ Included herein are coarse-grained earthenware and stoneware articles; fine-grained earthenware having a reddish-colored body and lustrous glaze; statues, statuettes, and hand-made flowers of ceramic ware produced by professional sculptors or reproduced from original molds; and smokers' articles, household articles, art and ornamental articles of chinaware, earthenware, ceramic tile, and other ceramic ware where the foregoing articles are not elsewhere enumerated in the tariff schedules.

Ceramic tile (items 532.21-.31), and fine-grained earthenware other than "Rockingham ware," stoneware, chinaware, and subporcelain articles used for preparing, serving or storing food or beverages (items 533.23-.77) are covered in other summaries in this volume.

Two distinct types of articles are discussed in this summary: (1) table and kitchen articles of coarse-grained earthenware and stoneware, and of fine-grained earthenware having a reddish-colored body

1/ Definitions of the various types of ceramic ware are given in appendix A of this volume.

and a lustrous glaze, and (2) statues, statuettes, and hand-made sculptured artificial flowers, and smokers' articles, household articles, and art and ornamental articles made from all types of ceramic bodies.

Coarse-grained earthenware is usually brown, red, or grey in color, and has a body made of materials none of which have been washed, ground, or otherwise beneficiated. Coarse-grained stoneware is usually made from a single light-colored clay that has not been washed, ground, or otherwise beneficiated. Stoneware is nonporous and very durable, but does not have the translucence of china. Fine-grained earthenware having a reddish-colored body and a lustrous glaze, frequently called "Rockingham ware", and other fine-grained earthenware is ware having a body made of materials any of which have been washed, ground, or otherwise beneficiated. The body of earthenware is porous, and will absorb more than 3 percent of its weight of water. Chinaware (including porcelain) is a fine-grained ware having a white body (unless articially colored) which will not absorb more than 0.5 percent of its weight of water. Subporcelain is similar to chinaware, except that it will absorb more than 0.5 percent but not more than 3 percent of its weight of water.

The articles made from coarse-grained earthenware and stoneware include mixing bowls, crocks, fruit jars, cooking and kitchen utensils and some tableware. However, production both in the United States and abroad of ware that meets the tariff requirements for "coarse-grained" ware is insignificant. Teapots, sugar bowls, and cream pitchers are the principal table and kitchenware articles of the fine-grained earthenware called "Rockingham ware". On teapots the lustrous glazes may be any color, but on other articles it must be mottled, streaked, or solidly colored brown to black with metallic oxide or salt. Vases, figurines, and bric-a-brac are the principal art and ornamental articles made from this earthenware.

The statues, statuettes, and hand-made artificial flowers produced by professional sculptors or reproduced from original molds most often are of chinaware or subporcelain or earthenware. These articles are valued for their craftsmanship and artistry of form and decoration.

Smokers' articles, household articles (other than table and kitchen articles), and art and ornamental articles include, but are not limited to, statues (other than those described in the preceding paragraph), figurines, flower holders, book ends, vases, lamp bases, wall plaques, and bric-a-brac. These articles are made from ceramic tile, earthenware or stoneware, chinaware (including bone china and

porcelain), subporcelain, and other ceramic bodies. 1/ Craftsmanship and artistry of form are the chief factors imparting value to these articles.

1/ Articles with "other ceramic bodies" include only those with a body not containing clay as an essential ingredient and having a water absorption of more than 3.0 percent, or ware having a non-white body that will absorb less than 3 percent of its weight in water. There is probably no production of such ware either in the United States or abroad.

ARTICLES OF COARSE-GRAINED EARTHENWARE OR STONEWARE, SO-CALLED "ROCKINGHAM" EARTHENWARE AND CERAMIC ART AND ORNAMENTAL ARTICLES

U.S. tariff treatment

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Articles chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients:			
533.11	Of coarse-grained earthenware, or of coarse-grained stoneware	5% ad val.	3% ad val.	2.5% ad val.
	Of fine-grained earthenware, whether or not decorated, having a reddish-colored body and a lustrous glaze which, on teapots, may be any color, but which, on other articles, must be mottled, streaked, or solidly colored brown to black with metallic oxide or salt:			
533.14	Valued not over $1.50 per doz. articles	12.5% ad val.	7% ad val.	6% ad val.
533.16	Valued over $1.50 per doz. articles	6.25% ad val.	6% ad val.	6% ad val.
534.11	Statues, statuettes, and hand-made flowers, all the foregoing not specially provided for, of ceramic ware, valued over $2.50 each and produced by professional sculptors or directly from molds made from original models produced by professional sculptors	8% ad val.	4.5% ad val.	4% ad val.
	Smokers' articles, household articles, and art and ornamental articles such as, but not limited to, statues, figurines, flowers, vases, lamp bases, bric-a-brac, and wall plaques, all the foregoing not specially provided for, of ceramic ware:			
534.21	Of ceramic tile	12.5% ad val.	7% ad val.	6% ad val.
534.31	Of coarse-grained earthenware, or of coarse-grained stoneware	5% ad val.	3% ad val.	2.5% ad val.
	Of fine-grained earthenware, whether or not decorated, having a reddish-colored body and a lustrous glaze, and mottled, streaked, or solidly colored brown to black with metallic oxide or salt:			
534.74	Valued not over $1.50 per doz. articles	12.5% ad val.	7% ad val.	6% ad val.
534.76	Valued over $1.50 per doz. articles	6.25% ad val.	3.5% ad val.	3% ad val.
	Of fine-grained earthenware or of fine-grained stoneware (except articles provided for in items 534.74 and 534.76):			
534.81	Valued not over $3 per doz. articles	10¢ per doz. pcs. + 25% ad val.	6.5¢ per doz. pcs. + 18.5% ad val.	6¢ per doz. pcs. + 17% ad val.
534.84	Valued over $3 but not over $10 per dozen articles	10¢ per doz. pcs. + 30% ad val.	6¢ per doz. pcs. + 18% ad val.	5¢ per doz. pcs. + 15% ad val.
534.87	Valued over $10 per doz. articles	4¢ per doz. pcs. + 20% ad val.	2¢ per doz. pcs. + 12% ad val.	2¢ per doz. pcs. + 10% ad val.
534.91	Of bone chinaware	25% ad val.	15% ad val.	12.5% ad val.
534.94	Of nonbone chinaware or of subporcelain	45% ad val.	27% ad val.	22.5% ad val.
534.97	Other	27% ad val.	16% ad val.	13.5% ad val.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from concessions granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. These concessions amount to reductions ranging from 32 to 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

The average ad valorem equivalents of the 1970 compound rates of duty, based on imports in 1970, were 24.3 percent for item 534.81, 22.5 percent for item 534.84, and 14.1 percent for item 534.87.

U.S. consumption

Apparent consumption of the pottery products covered by this summary amounted in value to $80.2 million in 1963 and to $98.1 million in 1967 (table 1). Imports comprised about one-third of consumption in 1963 and about one-fourth of consumption in 1967. The bulk of the articles consumed in recent years was art and decorative products.

U.S. producers and production

In 1967, the latest year for which data are available, 434 firms produced the articles covered in this summary. Most of these firms employed less than 10 workers. The principal areas of production were the North Central, Middle Atlantic, and Pacific Coast States.

Production of the commodities covered by this summary amounted in value to $53.6 million in 1963, and $73.5 million in 1967 (table 1).

In 1967 domestic production of art pottery was valued at $46.8 million. About 15 percent of this amount probably consisted of articles competitive with imported statues, statuettes, and hand-made flowers. The remaining production of about $40.0 million was probably divided about equally between chinaware and fine-grained earthenware or stoneware smokers' articles, household articles, and art and ornamental articles. Data are not available on the production of art pottery of ceramic tile and other ceramic ware.

Production of red unglazed earthenware, principally flower pots and other florist articles, was valued at $5.8 million in each of the years 1963 and 1967; production of stoneware table and kitchen articles amounted to 872,000 dozen, valued at $3.3 million in 1963, and was valued at $1.9 million in 1967. Production of earthenware competitive with imported "Rockingham earthenware"--generally referred to as "patio ware"--exceeded $1.5 million annually during 1964-68.

U.S. exports

Exports of the articles covered in this summary have been negligible for many years, as compared to domestic production and to imports. In 1958 exports were equivalent to 1 percent of production; in 1963 and 1967 to less than 1 percent of production. Exports were equivalent to 1 percent of imports in 1963 and to 2 percent in 1967. During 1966-70, the value of annual exports averaged $521,000, an increase of about 20 percent over the annual average for the previous 5-year period. All of the articles exported were earthenware and chinaware art and decorative products, most of which were shipped to Canada.

U.S. imports

In the period 1966-70, imports of the articles covered by this summary increased in value from $24.9 million in 1966 to $41.5 million in 1970 (table 1) and averaged $31.2 million annually, an increase of about 31 percent over the annual average for the preceding five years. Imports comprised about 34 percent of consumption in 1963, and about 26 percent in 1967.

During 1966-70, about 86 percent of the value of imports of all ceramic products considered in this summary consisted of smokers' articles, household articles, and art and ornamental articles (art pottery). The value of imported art pottery increased from $21.8 million in 1966 to $34.9 million in 1970 (table 2) and averaged $26.9 million in 1966-70. During this period 68 percent of the value of imported art pottery consisted of fine-grained earthenware or stoneware articles, 31 percent of chinaware and subporcelain articles, and 1 percent of ceramic tile and other ceramic ware articles. Japan supplied 60 percent of the value of art pottery imports during the period and was the principal supplier of all classes of art pottery, with the exception of fine-grained earthenware or stoneware valued over $10 per dozen. In this category, Italy was the principal supplier.

Most of the imported art pottery was similar to and directly competitive with all types and grades of articles produced in the United States. However, some imports (principally those with a unit value of less than $1 per dozen) were inferior to, and lower priced, than domestic articles; a few imports were also of a type peculiar to the country of origin.

ARTICLES OF COARSE-GRAINED EARTHENWARE OR STONEWARE, SO-CALLED "ROCKINGHAM" EARTHENWARE AND CERAMIC ART AND ORNAMENTAL ARTICLES

Imports of so-called "Rockingham ware" averaged $1.6 million annually during the period 1966-70 (table 3). Imports valued over $1.50 per dozen comprised 57 percent of imports of this ware. Most of the imports consisted of teapots of varous sizes; however, in recent years plates, cups and saucers, and various decorative articles have entered. Japan was the principal supplier of these articles.

Imports of coarse-grained earthenware and stoneware have been relatively small for many years. Imports of these articles averaged $242,480 annually in 1966-70. The principal suppliers were Japan, Mexico, and Italy. In recent years inquiries and decisions made by the Bureau of Customs indicate that little ware made anywhere have a body made of materials none of which have been washed, ground, or otherwise beneficiated.

The value of imported statues, statuettes, and hand-made flowers, valued over $2.50 each, ranged from $1.6 million in 1967 to $4.2 million in 1970 (table 4). Average annual imports during 1966-70 amounted to about $2.5 million, a 150 percent increase over the annual average for the previous 5-year period. West Germany and the United Kingdom were the principal suppliers of these articles. Some of the imported articles possessed distinctive qualities or characteristics peculiar to the country in which they originated, and thus did not compete directly with domestic items.

ARTICLES OF COARSE-GRAINED EARTHENWARE OR STONEWARE, SO-CALLED "ROCKINGHAM" EARTHENWARE AND CERAMIC ART AND ORNAMENTAL ARTICLES

Table 1.--Articles of coarse-grained earthenware or stoneware, fine-grained earthenware having a reddish-colored body and a lustrous glaze, statues, statuettes, and hand-made flowers not elsewhere enumerated, and ceramic art and ornamental articles not elsewhere enumerated: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-70.

(In thousands of dollars)

Year	Production	Imports	Exports 1/	Apparent consumption	Ratio (percent) of imports to consumption
1963	53,573	2/ 27,022	349	80,246	34
1964	3/	23,824	490	3/	3/
1965	3/	24,338	435	3/	3/
1966	3/	24,856	580	3/	3/
1967	73,500	25,157	567	98,090	26
1968	3/	29,376	544	3/	3/
1969	3/	35,231	437	3/	3/
1970	3/	41,507	479	3/	3/

1/ Export statistics include bottles, jugs, and religious articles not included in the import statistics.

2/ Partly estimated.

3/ Not available.

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

Table 2.--Smokers' articles, household articles, and art and ornamental articles not elsewhere enumerated 1/ of fine-grained earthenware or stoneware (except earthenware having a reddish-colored body and a lustrous glaze), chinaware (including bone china), subporcelain, ceramic tile or other ceramic ware: U.S. imports for consumption, by principal sources, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
Japan	13,581	13,491	13,339	13,443	15,565	17,949	20,020
Italy	3,151	3,267	3,387	3,386	3,773	4,696	5,051
United Kingdom	1,299	1,376	1,547	1,504	1,735	2,165	2,809
West Germany	1,096	1,071	1,151	1,420	1,589	1,512	1,893
Denmark	275	331	429	468	567	581	1,315
France	5	11	9	6	495	798	799
Spain	9	3	19	11	360	480	524
Netherlands	122	157	162	162	216	269	261
Canada	2	3	-	11	9	29	93
All other	1,550	1,638	1,737	1,741	1,235	1,684	2,096
Total	21,090	21,348	21,780	22,152	25,544	30,163	34,861

1/ Excludes data on articles of coarse-grained earthenware or stoneware, so-called "Rockingham" ware, and certain other ceramic wares; see tables 3 and 4.

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

ARTICLES OF COARSE-GRAINED EARTHENWARE OR STONEWARE, SO-CALLED "ROCKINGHAM" EARTHENWARE AND CERAMIC ART AND ORNAMENTAL ARTICLES

Table 3.--Articles of fine-grained earthenware having a reddish-colored body and lustrous glaze: U.S. imports for consumption, by principal sources, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
Japan	1,306	1,298	1,236	1,176	1,281	1,550	1,892
Canada	34	19	31	21	44	61	60
United Kingdom	52	40	39	43	34	42	53
Hong Kong	11	7	7	6	3	5	5
All other	14	17	16	22	24	74	58
Total	1,417	1,381	1,329	1,268	1,386	1,732	2,068

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

Table 4.--Statues, statuettes, and hand-made flowers, not elsewhere enumerated: U.S. imports for consumption, by principal sources, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
West Germany	224	346	323	457	706	805	1,444
United Kingdom	471	657	651	597	634	738	1,229
Italy	209	230	275	241	385	463	475
Japan	50	41	71	84	160	526	474
Denmark	90	127	167	98	163	134	234
All other	151	153	162	105	151	311	370
Total	1,195	1,554	1,649	1,582	2,199	2,977	4,226

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

Commodity	TSUS item
Fine-grained earthenware and stoneware---	533.23, -.25, - .26, -.28, -.31, -.33, -.35, -.36, -.38

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States is a major producer of earthenware; annual production averaged about 20 million dozen pieces during 1963-67. In terms of volume, imports were many times greater than exports and accounted for about one-third of domestic consumption in the period. Exports amounted to about 2 percent of production.

Description and uses

This summary covers fine-grained earthenware and fine-grained stoneware articles 1/ chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients. Both imported and domestic earthenware and stoneware articles are made in a wide variety of shapes, patterns, and decorations. Fine-grained earthenware having a reddish-colored body and a lustrous glaze (items 533.14 and 533.16) are treated in another summary in this volume. Plastic dinnerware and certain other plastic articles (items 772.03, -.06, -.09, and -.15) are covered in the summary on Rubber and Plastic Products in volume 7:7.

Fine-grained earthenware has an absorbent, opaque body which is usually white and covered with a transparent glaze. Earthenware includes so-called semivitreous and semiporcelain ware, as well as ironstone china, all of which are hard-fired earthenware. Earthenware bodies have a water absorption capacity usually in the range of 3 to 10 percent. Fine-grained stoneware has an opaque, light-colored body that will absorb little or no water. The unglazed body of stoneware cannot be scratched with a steel blade, whereas the unglazed body of earthenware can be scratched. Normally, the glazes applied to earthenware are so hard and smooth that they cannot be scratched by ordinary steel. Most earthenware and stoneware is decorated, the decoration being applied either under or over the glaze.

1/ Definitions of the various types of earthenware and stoneware are given in appendix A of this volume. Additional information on such articles may be found on page 75, Sched. 5 volume of The Tariff Classification Study (1960).

The earthenware 1/ articles considered herein classed according to use are: tableware, which consists of articles primarily for serving food and drink at the table; and kitchenware, which consists of articles primarily for preparing and storing food and drink. Tableware can be further divided into: (1) dinnerware or ware for service of complete meals at the table, and (2) other tableware. For tariff purposes, ware "available in specified sets" 2/ (items 533.23, -.25, -.26, -.28) is considered dinnerware.

1/ Stoneware articles account for an insignificant part of the commercially available ware covered by this summary; therefore the discussion is, in general, limited to earthenware.

2/ This phrase has been construed to mean that all the articles enumerated in headnote 2(b) to part 2(c) of schedule 5 are available to the importer in the United States from foreign countries. However, all articles do not have to be imported in the same entry.

U.S. tariff treatment

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Articles chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients:			
	Of fine-grained earthenware (except articles provided for in items 533.14 and 533.16) or of fine-grained stoneware:			
	Available in specified sets:			
533.23	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is not over $3.30	10¢ per doz. pcs. + 28% ad val.	6¢ per doz. pcs. + 16.5% ad val.	5¢ per doz. pcs. + 14% ad val.
533.25	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $3.30 but not over $7	10¢ per doz. pcs. + 37% ad val.	10¢ per doz. pcs. + 24% ad val.	10¢ per doz. pcs. + 21% ad val.
533.26 1/	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $7 but not over $12	10¢ per doz. pcs. + 21% ad val.	2/	2/
533.28 1/	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $12	10¢ per doz. pcs. + 21% ad val.	6¢ per doz. pcs. + 12.5% ad val..	5¢ per doz. pcs. + 10.5% ad val.
	Not available in specified sets:			
533.31	Steins, mugs, candy boxes, decanters, punch bowls, pretzel dishes, tidbit dishes, tiered servers, and bonbon dishes	10¢ per doz. pcs. + 25% ad val.	6¢ per doz. pcs. + 15% ad val.	5¢ per doz. pcs. + 12.5% ad val.
	Other articles:			
533.33	Cups valued not over $0.50 per dozen, saucers valued not over $0.30 per dozen, plates not over 9 inches in maximum diameter and valued not over $0.50 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued not over $1 per dozen, and other articles valued not over $1 per dozen	10¢ per doz. pcs. + 25% ad val.	6¢ per doz. pcs. + 15% ad val.	5¢ per doz. pcs. + 12.5% ad val.
533.35	Cups valued over $0.50 but not over $1 per dozen, saucers valued over $0.30 but not over $0.55 per dozen, plates not over 9 inches in maximum diameter and valued over $0.50 but not over $0.90 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $1 but not over $1.55 per dozen, and other articles valued over $1 but not over $2 per dozen	10¢ per doz. pcs. + 40% ad val.	10¢ per doz. pcs. + 24.5% ad val.	10¢ per doz. pcs. + 21% ad val.

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Articles chiefly used for preparing, serving, etc.--Con.			
	Of fine-grained earthenware etc.--Con.			
	Not available in specified sets:--Con.			
	Other articles:--Con.			
533.36 1/	Cups valued over $1 but not over $1.70 per dozen, saucers valued over $0.55 but not over $0.95 per dozen, plates not over 9 inches in maximum diameter and valued over $0.90 but not over $1.55 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $1.55 but not over $2.65 per dozen, and other articles valued over $2 but not over $3.40 per dozen----------	10¢ per doz. pcs. + 22% ad val.	10¢ per doz. pcs. + 21% ad val.	10¢ per doz. pcs. + 21% ad val. 3/
533.38 1/	Cups valued over $1.70 per dozen, saucers valued over $0.95 per dozen, plates not over 9 inches in maximum diameter and valued over $1.55 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $2.65 per dozen, and other articles valued over $3.40 per dozen----------	10¢ per doz. pcs. + 22% ad val.	6¢ per doz. pcs. + 13% ad val.	5¢ per doz. pcs. + 11% ad val.

1/ This classification became effective January 1, 1968. Related TSUS items, which had been in effect from August 31, 1963 through December 31, 1967, are shown as follows:

Existing item	Previous item
533.26	533.27 (pt.)
533.28	533.27 (pt.)
533.36	533.37 (pt.)
533.38	533.37 (pt.)

2/ Rate of duty not affected by trade conference.

3/ This final rate became effective January 1, 1970.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from concessions granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. These concessions amount to total reductions ranging from 4 to 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

The average ad valorem equivalents of the 1970 compound rates of duty, based on imports in 1970, were as follows:

TSUS item	Percent
533.23	23.4
533.25	36.4
533.26	27.1
533.28	16.7
533.31	20.6
533.33	26.1
533.35	36.8
533.36	26.5
533.38	16.2

U.S. consumption

In 1963-67, annual consumption of earthenware table and kitchen articles decreased from 32.1 million dozen pieces in 1963 to 25.5 million dozen pieces in 1967, a decline of about 20 percent (table 1). In that period, average annual consumption was 28.8 million dozen pieces, a decrease of about 7 percent from the equivalent average for the previous 5-year period. Imported earthenware comprised about one-third of consumption during the period, 1963-67.

Dinnerware (ware available in specified sets) accounted for 85 percent of the total consumption of earthenware table and kitchen articles in 1963-67. Consumption ranged from 28.1 million dozen pieces in 1964 to 20.4 million dozen pieces in 1967 (table 2). For 1963-67, the average annual consumption was 24.4 million dozen pieces, a decrease of about 8 percent from the similar average for the preceding 5-year period.

Consumption of non-dinnerware articles averaged 4.4 million dozen pieces annually in 1963-67. This was a decrease of about 2 percent from the annual average for the previous 5-year period. Nearly all of the articles consumed were imported.

In the U.S. market for table and kitchenware, earthenware competes in the broad sense with chinaware, plastic ware, and glassware. The choice depends largely on how much the customer is willing to pay, the personal preferences as to design and decoration, and the emphasis placed on durability and prestige.

U.S. producers

In 1967, earthenware was produced by 22 firms, one of which operated two plants. All but 3 of the firms produced only earthenware table and kitchen articles; 2 of the firms also produced hotel chinaware, and the third was a division of a multi-product concern. Since 1962, only one new firm has undertaken the production of earthenware; however, four firms have ceased producing earthenware. In 1967, the earthenware industry employed an average of 6,357 employees, about 88 percent of whom were production and related workers. Five firms employed over 500 workers each in 1967.

U.S. production

Dinnerware has always been the predominant type of earthenware produced in the United States. During 1963-67, more than 98 percent of the U.S. production of earthenware consisted of dinnerware. Production (sales) of domestic earthen dinnerware declined from 23.5 million dozen pieces, valued at $51.6 million in 1963, to 15.0 million

million dozen pieces, valued at $36.8 million in 1967 (table 2). This represents a decline of 36 percent in quantity and 29 percent in value since 1963. Annual production (sales) during the period 1963-67 averaged 19.3 million dozen pieces, valued at $43.4 million, which was 15 percent less in volume and 13 percent less in value than similar average sales for the preceding 5-year period.

Low-priced earthen dinnerware, selling at retail for not over $30 per 45-piece set, 1/ is the principal ware produced in the United States. During 1963-67, such low-priced ware accounted for 94 percent of the quantity and 80 percent of the value of production. Medium-priced dinnerware, selling at retail between $30 and $66 per 45-piece set, accounted for 3 percent of the quantity and 5 percent of the value of production. High-priced dinnerware, selling at retail for over $66 per 45-piece set, comprised 3 percent of the quantity and 15 percent of the value of production.

U.S. exports

During 1966-70, exports of earthenware table and kitchen articles ranged from 293,000 dozen pieces in 1969 to 459,000 dozen pieces in 1966 (table 3) and averaged 359,000 dozen pieces, valued at $1.4 million annually. They decreased 8 percent in quantity, but increased 83 percent in value from the corresponding average annual exports for the previous 5-year period. Seventy-six percent of the exports were shipped to Canada. Exports are believed to consist largely of off-selection ware (seconds); in recent years they have averaged about 2 percent of production.

U.S. imports

During 1966-70, imports of earthenware table and kitchen articles increased irregularly from 10.5 million dozen pieces, valued at $21.7 million in 1966 to nearly 14.0 million dozen pieces, valued at $38.1 million in 1970 (table 4), and averaged 12.0 million dozen pieces valued at $28.4 million annually during 1966-70. Such average annual imports had increased to 35 percent in quantity and 87 percent in value over the previous 5-year period. During this period, 52 percent of imports, based on quantity, consisted of dinnerware.

1/ A typical 45-piece set (service for 8) consists of: 8 dinner plates; 8 cups and saucers; 8 bread and butter plates; 8 fruit or cereal or soup plates; 1 platter; 1 vegetable dish; 1 creamer; and 1 sugar bowl and lid.

Imports of earthen dinnerware (available in specified sets) increased irregularly from 5.9 million dozen pieces in 1966 to 6.9 million dozen pieces in 1970 (table 5). In 1966-70, average annual dinnerware imports amounted to 6.3 million dozen pieces, valued at $16.0 million, which was about 37 percent greater in volume and 78 percent greater in value than the corresponding average annual imports for the preceding 5-year period.

Dinnerware having a unit value of over $7 per 77-piece norm, 1/ which accounted for about 95 percent of the quantity of dinnerware imported during 1966-70, increased irregularly from 5.5 million dozen pieces, valued at $12.8 million in 1966 to 6.8 million dozen pieces, valued at $20.4 million in 1970 (table 6). The United Kingdom and Japan together supplied most of the imported dinnerware valued over $7 per norm, while Japan alone supplied most of the ware valued at less that $7 per norm.

In 1966-70, annual imports of earthenware not available in specified sets averaged 5.7 million dozen pieces. This was an increase of about 33 percent from the preceding 5-year average. Imports of these wares consisted mainly of the high- and the low-valued articles and of such articles as steins, mugs, tidbit dishes, and bonbon dishes. Imports of articles in the middle value range were small. Japan was the principal supplier of all categories of this type ware.

1/ The composition of a 77-piece norm is explained in headnote 2(b) to part 2(c) of schedule 5, TSUSA-1971 as reproduced in appendix A to this volume.

Table 1.--Fine-grained earthenware and fine-grained stoneware articles chiefly used for preparing, serving, or storing food and beverages: U.S. production (shipments), imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-70

(Quantity in 1,000 dozen pieces; value in 1,000 dollars)

Year	Production	Imports	Exports 1/	Apparent consumption	Ratio (percent) of imports to consumption
			Quantity		
1963	2/ 23,801	3/ 8,642	349	32,094	27
1964	2/ 23,379	8,696	375	31,700	27
1965	2/ 19,781	9,005	337	28,449	32
1966	2/ 16,221	10,520	459	26,282	40
1967	2/ 15,634	10,314	405	25,543	40
1968	2/ 18,212	12,064	323	29,953	40
1969	2/ 17,594	12,965	293	30,267	43
1970	2/ 13,198	13,958	316	26,840	52
			Value		
1963	2/ 52,693	3/15,032	779	66,946	4/
1964	2/ 50,338	16,104	664	65,778	4/
1965	2/ 44,750	17,912	898	61,764	4/
1966	2/ 38,300	21,706	1,119	58,887	4/
1967	2/ 38,900	22,398	1,226	60,072	4/
1968	5/	26,917	1,353	5/	5/
1969	5/	32,755	1,585	5/	5/
1970	5/	38,100	1,552	5/	5/

1/ Includes some sanitary ware articles in 1965 and later years.
2/ Partly estimated.
3/ Estimated.
4/ Not meaningful.
5/ Not available.

Source: Production, compiled from data submitted to the Tariff Commission by domestic producers of earthenware; imports and exports, compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 2.--Fine-grained earthenware and fine-grained stoneware, available in specified sets: U.S. production (shipments), imports for consumption, exports of domestic merchandise, and apparent consumption, 1963-70

(Quantity in 1,000 dozen pieces; value in 1,000 dollars)

Year	Production	Imports	Exports 1/	Apparent consumption	Ratio (percent) of imports to consumption
			Quantity		
1963	2/ 23,465	3/ 4,548	35	27,978	16
1964	2/ 23,019	5,079	36	28,062	18
1965	2/ 19,403	4,917	34	24,286	20
1966	2/ 15,597	5,854	46	21,405	27
1967	2/ 14,952	5,517	41	20,428	27
1968	2/ 17,451	6,242	32	23,661	26
1969	2/ 16,622	6,785	29	23,378	29
1970	2/ 12,280	6,919	32	19,167	36
			Value		
1963	2/ 51,556	3/ 9,175	78	60,653	4/
1964	2/ 49,121	10,161	66	59,216	4/
1965	2/ 43,379	10,849	90	54,138	4/
1966	2/ 36,300	13,076	112	49,264	4/
1967	2/ 36,800	13,242	123	49,919	4/
1968	5/	15,187	135	5/	5/
1969	5/	18,046	159	5/	5/
1970	5/	20,579	155	5/	5/

1/ Estimates of first-line dinnerware based on reports submitted to the Tariff Commission by domestic producers of earthen dinnerware for the period 1957-62.

2/ Partly estimated.

3/ Estimated.

4/ Not meaningful.

5/ Not available.

Source: Production, compiled from data submitted to the Tariff Commission by domestic producers of earthenware; imports and exports, compiled from official statistics of the U.S. Department of Commerce, except as noted.

FINE-GRAINED EARTHENWARE AND STONEWARE

Table 3.--Fine-grained earthenware and fine-grained stoneware articles: U.S. exports of domestic merchandise, by principal markets, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Canada	332	291	400	333	266	170	198
Bahamas	1	2	12	9	9	30	18
Venezuela	2	4	6	7	3	9	43
Mexico	10	10	12	20	10	8	6
Jamaica	2	2	2	1	1	2	1
All other	28	28	27	35	34	1/ 74	50
Total	375	337	459	405	323	293	316
	Value (1,000 dollars)						
Canada	474	610	768	829	954	700	736
Bahamas	5	14	72	56	69	147	121
Venezuela	8	32	42	46	27	87	95
Mexico	43	36	26	44	39	31	22
Jamaica	8	18	19	15	7	28	13
All other	126	188	192	236	257	1/ 592	565
Total	664	898	1,119	1,226	1,353	1,585	1,552

1/ Includes exports of 37 thousand dozen pieces, valued at $258 thousand, to the United Kingdom.

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

Table 4.--Fine-grained earthenware and fine-grained stoneware articles: U.S. imports for consumption, by principal sources, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Japan	5,712	6,157	7,251	7,540	8,298	8,752	9,641
United Kingdom	2,416	2,215	2,485	2,106	2,906	3,227	3,371
Italy	150	221	256	225	299	342	289
West Germany	86	97	111	94	107	137	127
All other	332	315	417	349	454	507	530
Total	8,696	9,005	10,520	10,314	12,064	12,965	13,958
	Value (1,000 dollars)						
Japan	7,705	8,726	10,828	11,501	13,619	16,583	20,165
United Kingdom	5,912	6,282	7,190	7,002	8,478	10,282	11,894
Italy	857	1,097	1,327	1,338	1,893	2,334	2,152
West Germany	488	551	750	890	846	1,209	1,279
All other	1,142	1,256	1,611	1,667	2,081	2,347	2,610
Total	16,104	17,912	21,706	22,398	26,917	32,755	38,100

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

Table 5.--Fine-grained earthenware and fine-grained stoneware, available in specified sets: U.S. imports for consumption, by principal sources, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
United Kingdom	2,317	2,109	2,364	1,993	2,760	3,001	3,104
Japan	2,570	2,585	3,143	3,235	3,147	3,490	3,514
Italy	38	70	91	72	59	50	43
West Germany	6	22	24	28	27	48	35
France	10	20	25	35	49	53	83
All other	138	111	207	154	200	143	140
Total	5,079	4,917	5,854	5,517	6,242	6,785	6,919
	Value (1,000 dollars)						
United Kingdom	5,345	5,652	6,404	6,145	7,553	8,837	10,022
Japan	4,137	4,362	5,479	5,795	6,255	7,912	9,132
Italy	168	219	275	310	342	347	308
West Germany	19	58	97	125	95	232	147
France	65	94	113	137	196	205	86
All other	427	464	708	730	746	513	884
Total	10,161	10,849	13,076	13,242	15,187	18,046	20,579

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

Table 6.--Fine-grained earthenware and fine-grained stoneware articles: U.S. imports for consumption, by value classes, 1964-70

Item	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Fine-grained earthenware and fine-grained stoneware articles:							
Available in specified sets 1/ valued:							
Not over $3.30	24	26	16	34	11	10	9
Over $3.30 but not over $7	626	410	384	365	313	202	159
Over $7	4,429	4,481	5,455	5,119	5,918	6,573	6,752
Subtotal	5,079	4,917	5,854	5,517	6,242	6,785	6,920
Not available in specified sets:							
Steins, mugs, etc.	1,154	1,354	1,836	1,887	2,288	2,570	3,252
Other articles:							
Low value	1,200	1,324	1,268	1,292	1,457	1,145	1,028
Medium value	303	317	378	414	563	635	772
High value	960	1,093	1,184	1,204	1,514	1,831	1,986
Subtotal	3,617	4,088	4,666	4,797	5,822	6,181	7,038
Total	8,696	9,005	10,520	10,314	12,064	12,965	13,958
	Value (1,000 dollars)						
Fine-grained earthenware and fine-grained stoneware articles:							
Available in specified sets 1/ valued:							
Not over $3.30	20	19	13	43	9	20	16
Over $3.30 but not over $7	500	354	303	305	280	194	169
Over $7	9,642	10,476	12,760	12,895	14,898	17,832	20,394
Subtotal	10,161	10,849	13,076	13,242	15,187	18,046	20,579
Not available in specified sets:							
Steins, mugs, etc.	1,801	2,197	3,120	3,265	4,069	4,974	6,320
Other articles:							
Low value	719	812	801	831	994	856	787
Medium value	280	312	351	390	591	717	934
High value	3,144	3,741	4,359	4,670	6,076	8,162	9,480
Subtotal	5,944	7,062	8,631	9,156	11,730	14,708	17,521
Total	16,104	17,912	21,706	22,398	26,917	32,755	38,100

1/ This term is defined in headnote 2 of part 2, schedule 5 of the TSUSA-1971, reproduced in appendix A of this volume.

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

Note.--Because of rounding, figures may not add to the totals shown.

CHINAWARE, HOTEL AND HOUSEHOLD, INCLUDING BONE CHINA

Commodity	TSUS item
Hotel chinaware	533.51
Household chinaware	533.41, -.63, -.65, -.66, -.68, -.69, -.71, -.73, -.75, -.77

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

During 1965-68, annual domestic consumption of hotel and household china averaged about 23 million dozen pieces. In terms of volume, imports amounted to 63 percent of consumption. Exports were small relative to imports and accounted for about 3 percent of domestic production.

Description and uses

This summary covers both table and kitchen china and subporcelain ware (generally referred to hereinafter as household chinaware), and hotel, restaurant, and other non-household chinaware (generally referred to hereinafter as hotel chinaware) chiefly used for preparing, serving, and storing food or drink and the ingredients thereof. The articles designated as household and hotel chinaware include feldspathic china, porcelain, subporcelain, and bone china. 1/ Art and ornamental objects of ceramic ware (items 534.11 through 534.94) and fine-grained earthenware and stoneware articles chiefly used for preparing, serving, and storing food or drink (items 533.23- .38) are covered in other summaries in this volume. Plastic dinnerware and certain other plastic articles (items 772.03- .15) are covered in the summary on Rubber and Plastic Products in volume 7:7.

1/ For the applicable definitions of these wares, see the headnotes to part 2 of schedule 5 of the TSUSA-1971, reproduced in appendix A of this volume.

CHINAWARE, HOTEL AND HOUSEHOLD, INCLUDING BONE CHINA

Household chinaware articles have a vitreous (virtually non-absorbent), translucent white or nearly white body covered with a transparent glaze. Feldspathic china (which until 1962 was the only kind of chinaware produced in the United States) and porcelain and subporcelain ware, the main kind of ware produced in Japan and continental Europe, contain no bone ash; the glass-forming ingredient is a feldspathic mineral. Until 1962, practically all the world output of bone china dinnerware was made in the United Kingdom. Commercial production of bone china dinnerware was begun in the United States in the last half of 1962, and in Japan in 1964. Most household chinaware is decorated, the decoration being applied either under or over the glaze. The more elaborate decorations are confined largely to over-the-glaze applications. Metallic decorations, once almost exclusively of either coin gold or bright gold, are now frequently of platinum or palladium.

Hotel chinaware has a vitreous, relatively translucent (but, not translucent in the thickness of most hotel ware pieces), white body covered with a transparent glaze. Hotel chinaware is thicker and heavier than household chinaware; it generally is less decorated, and the pieces are usually simpler in shape. Metallic decoration on hotel chinaware is rare, and any color designs are usually under the glaze. A type of household china dinnerware, ordinarily referred to as casual ware, has been developed in the United States in recent years. This ware is generally thicker than formal china, but not as thick as hotel ware.

Household and hotel chinaware is very resistant to thermal and mechanical shock, hence they do not readily chip, crack, or craze (the glaze does not crackle), and the bodies are not susceptible to staining if the glaze is chipped.

Household and hotel chinaware articles can be further identified as: tableware consisting of articles designed primarily for serving food and drink at the table; and kitchenware consisting of articles designed primarily for preparing and storing food and drink. Household tableware can be further divided into: (1) dinnerware or ware for service of complete meals at the table, and (2) other tableware, such as beverage and dessert sets, service plates, and other shortline (incomplete service) tableware. For tariff purposes, ware "available in specified sets" 1/ is considered dinnerware.

1/ The phrase "available in specified sets" has been construed to mean that all the articles enumerated in headnotes 2(b) and 2(c) are available to the importer in the United States from foreign countries. However, all articles do not have to be imported in the same entry.

U.S. tariff treatment

The column 1 (or trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1970) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Articles chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients:			
533.41	Of bone chinaware	35% ad val.	21% ad val.	17.5% ad val.
	Of nonbone chinaware or of subporcelain:			
533.51	Hotel or restaurant ware and other ware not household ware	10¢ per doz. pcs. + 45% ad val.	1/	1/
	Household ware available in specified sets:			
533.63	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is not over $10	10¢ per doz. pcs. + 48% ad val.	1/	1/
533.65	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $10 but not over $24	10¢ per doz. pcs. + 55% ad val.	1/	1/
533.66 2/	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $24 but not over $56	10¢ per doz. pcs. + 36% ad val.	1/	1/
533.68 2/	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $56	10¢ per doz. pcs. + 36% ad val.	6¢ per doz. pcs. + 21.5% ad val.	5¢ per doz. pcs. + 18% ad val.
533.69	Not covered by item 533.63, 533.65, 533.66, 533.68, and in any pattern for which the aggregate value of the articles listed in headnote 2(c) of this subpart is over $8	10¢ per doz. pcs. + 36% ad val.	6¢ per doz. pcs. + 21.5% ad val.	5¢ per doz. pcs. + 18% ad val.
	Household ware not covered by item 533.63, 533.65, 533.66, 533.68, or 533.69:			
533.71	Steins, mugs, candy boxes, decanters, punch bowls, pretzel dishes, tidbit dishes, tiered servers, and bonbon dishes	45% ad val.	27% ad val.	22.5% ad val.
	Other articles:			
533.73	Cups valued not over $1.35 per dozen, saucers valued not over $0.90 per dozen, plates not over 9 inches in maximum diameter and valued not over $1.30 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued not over $2.70 per dozen, and other articles valued not over $4.50 per dozen	10¢ per doz. pcs. + 45% ad val.	6¢ per doz. pcs. + 27% ad val.	5¢ per doz. pcs. + 22.5% ad val.

CHINAWARE, HOTEL AND HOUSEHOLD,
INCLUDING BONE CHINA

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Articles chiefly used for preparing, serving, etc.--Con.			
	Of nonbone chinaware or of subporcelain:--Con.			
	Household ware not covered, etc.--Con.			
	Other articles:			
533.75	Cups valued over $1.35 but not over $4 per dozen, saucers valued over $0.90 but not over $1.90 per dozen, plates not over 9 inches in maximum diameter and valued over $1.30 but not over $3.40 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $2.70 but not over $6 per dozen, and other articles valued over $4.50 but not over $11.50 per dozen----------	10¢ per doz. pcs. + 60% ad val.	6¢ per doz. pcs. + 36% ad val.	5¢ per doz. pcs. + 30% ad val.
533.77	Cups valued over $4 per dozen, saucers valued over $1.90 per dozen, plates not over 9 inches in maximum diameter and valued over $3.40 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $6 per dozen, and other articles valued over $11.50 per dozen----------	10¢ per doz. pcs. + 35% ad val.	6¢ per doz. pcs. + 21% ad val.	5¢ per doz. pcs. + 17.5% ad val.

1/ Rate of duty not affected by trade conference.

2/ This classification became effective January 1, 1968. Related TSUS items, which had been in effect from August 31, 1963 through December 31, 1967, are shown as follows:

Existing item	Previous item
533.66	533.67 (pt.)
533.68	533.67 (pt.)

CHINAWARE, HOTEL AND HOUSEHOLD,
INCLUDING BONE CHINA

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from concessions granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. These concessions amount to total reductions of about 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

The average ad valorem equivalents of the 1970 compound rates of duty, based on imports in 1970, were as follows:

TSUS item	Percent
533.51	49.8
533.63	59.9
533.65	59.4
533.66	38.2
533.68	25.5
533.69	25.6
533.73	37.2
533.75	44.2
533.77	26.1

U.S. consumption

Domestic consumption of hotel and household chinaware increased from 20.3 million dozen pieces, valued at $88.2 million in 1965 to 27.2 million dozen pieces, valued at $118.0 million in 1968 (table 1), an increase of 34 percent in both quantity and value in 1965-68.

Consumption of household chinaware increased from 13.2 million dozen pieces, valued at $49.8 million in 1965 to 19.1 million dozen pieces, valued at $69.1 million in 1968 (table 2), an increase of 45 percent in quantity and 39 percent in value in 1965-68. Consumption of hotel chinaware increased from 7.1 million dozen pieces, valued at $38.4 million in 1965 to 8.1 million dozen pieces, valued at $48.9 million in 1968 (table 3), an increase of 14 percent in quantity and 27 percent in value in 1965-68.

Household chinaware table and kitchen articles compete with earthenware and plastic ware for the consumer's dollar in the dinnerware market. The choice depends largely on how much the consumer is willing to pay, his personal preferences to designs and decorations, and the emphasis placed on durability and prestige. In recent years, purchases of dinnerware, table, and kitchen articles have represented a smaller part of the consumer's aggregate purchasing power due to

competition from increased sales of plastic ware and other household products, such as televisions and refrigerators.

Factors affecting the consumption of hotel chinaware are: (1) competition from plastic ware, and (2) improvements in hotel and restaurant handling of china and increased durability of the ware which has decreased the rate of breakage and thus prolonged the useful life of the average piece of ware.

U.S. producers and production

Eighteen firms, operating 22 plants, produced household and hotel chinaware in the United States in 1967. Eleven firms produced household chinaware, and 12 produced hotel chinaware. Five of the 18 firms produced both household and hotel chinaware. The principal producing areas for household chinaware were California, Ohio, and New York. Some household chinaware was also produced in Illinois, New Jersey, Pennsylvania, and West Virginia. The production of hotel chinaware was concentrated in California, New York, Ohio, and Pennsylvania.

Production (shipments) of hotel and household chinaware increased from 8.0 million dozen pieces, valued at $58.4 million in 1965 to 8.9 million dozen pieces, valued at $67.8 million in 1967, then decreased to 8.8 million dozen pieces, valued at $72.5 million in 1968 (table 1). Average annual production of hotel and household chinaware in 1965-68 amounted to 8.6 million dozen pieces, valued at $65.8 million.

Average annual production of household chinaware in 1965-68 was 784 thousand dozen pieces, valued at $20.9 million (table 2). Average annual production of hotel chinaware in 1965-68 amounted to 7.8 million dozen pieces, valued at $44.9 million (table 3). In 1965-68 production of hotel chinaware accounted for 91 percent of the total quantity and 68 percent of the value of hotel and household chinaware production.

U.S. exports

Exports of hotel and household chinaware rose from 217,000 dozen pieces, valued at $1.1 million in 1966, to 274,000 dozen pieces, valued at $1.4 million in 1967, declined to 223,000 dozen pieces, valued at $1.3 million in 1968, then rose again to 259,000 dozen pieces, valued at $1.4 million in 1970 (table 4). During the period 1966-70, exports of hotel and household chinaware averaged 240,000 dozen pieces, valued at $1.3 million. Exports of hotel chinaware accounted for an estimated 77 percent of the quantity of total exports in 1966-70. Exports of household chinaware are believed to have consisted largely of off-selection ware (seconds) and merchandise sent to U.S. embassies in recent years.

Most of the hotel and household chinaware exported in 1966-70 went to Canada (68 percent), the Bahamas (8 percent), and Mexico (5 percent). Smaller amounts were shipped to Venezuela, the United Kingdom, Jamaica, and France.

U.S. imports

Imports of hotel and household chinaware increased from 12.9 million dozen pieces, valued at $33.2 million in 1966 to 22.2 million dozen pieces, valued at $60.3 million in 1969, then decreased to 19.1 million dozen pieces valued at $57.2 million in 1970 (table 1). During 1966-70 imports of hotel and household china averaged 17.4 million dozen pieces, valued at $46.6 million annually.

Household chinaware.--Since World War II the trend in imports of household china table and kitchen articles has been markedly upward. Imports supplied 95 percent of apparent domestic consumption of the quantity of household china table and kitchen articles in the United States in 1964-68.

Imported household chinaware (excluding bone china), which comprised the bulk of the imports, rose from 12.1 million dozen pieces, valued at $28.0 million in 1966 to 21.2 million dozen pieces, valued at $52.8 million in 1969, then declined to 18.0 million dozen pieces valued at $49.6 million in 1970 (table 5). During this period the proportion of imports consisting of dinnerware averaged 78 percent of the quantity and 83 percent of the value of non-bone household chinaware; most of the remainder consisted of articles unlike any produced in the United States. Imports of household dinnerware (ware available in specified sets) increased from 10.0 million dozen pieces, valued at $24.3 million in 1966 to 16.9 million dozen pieces, valued at $43.8 million in 1969, then declined to 13.0 million dozen pieces valued at $38.7 million in 1970 (table 6). Imports of dinnerware having a foreign unit value of over $10 but not over $24 per 77-piece norm, which comprised 75 percent of the quantity of dinnerware imported in 1966-70, increased from 6.9 million dozen pieces in 1966 to 13.0 million dozen pieces in 1969, then declined to 9.7 million dozen pieces in 1970. The majority of the non-dinnerware imports consisted of low-value items not available in specified sets (51 percent) and such articles as steins, mugs, candy boxes, and tiered servers (35 percent). Japan (89 percent) and West Germany (6 percent) were the major suppliers of household chinaware (excluding bone china) in 1966-70.

CHINAWARE, HOTEL AND HOUSEHOLD, INCLUDING BONE CHINA

Bone chinaware articles accounted for 4 percent of the quantity and 13 percent of the value of total imports of household chinaware in 1966-70. During this period, annual imports of bone chinaware declined from 775,000 dozen pieces in 1966 to 525,000 dozen pieces in 1967, then increased to 655,000 dozen pieces in 1970 (table 7). The United Kingdom was the major source of imports (89 percent), and nearly all of the remainder from Japan.

Hotel chinaware.--Imports of hotel chinaware have always been small relative to the domestic output of such ware. During 1966-70, annual imports of hotel chinaware varied somewhat but increased from 147,000 dozen pieces, valued at $294,000 in 1966 to 417,000 dozen pieces, valued at $864,000 in 1970 (table 8).

During 1966-70, Brazil was the major source of imports (48 percent), followed by Japan (35 percent), and West Germany (9 percent). Imports from Japan consist principally of oriental design ware, but also include some western style ware. Imports from the United Kingdom and Brazil are comparable with U.S. ware.

Table 1.--Hotel and household chinaware and subporcelain articles chiefly used for preparing, serving, or storing food or beverages: U.S. production (shipments), imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

Year	Production	Imports	Exports	Apparent consumption
	Quantity (1,000 dozen pieces)			
1964	1/	11,712	123	1/
1965	2/ 7,962	12,494	189	20,267
1966	2/ 8,781	12,869	217	21,433
1967	2/ 8,852	14,089	274	22,667
1968	2/ 8,770	18,660	223	27,207
1969	1/	22,227	227	1/
1970	1/	19,060	259	1/
	Value (1,000 dollars)			
1964	2/ 55,784	27,690	879	82,595
1965	2/ 58,364	30,767	926	88,205
1966	2/ 64,399	33,185	1,106	96,478
1967	2/ 67,821	35,531	1,363	101,989
1968	2/ 72,478	46,896	1,326	118,048
1969	1/	60,285	1,399	1/
1970	1/	57,175	1,439	1/

1/ Not available.

2/ Estimate based on data submitted to the Tariff Commission by domestic producers.

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

Table 2.--Household chinaware and subporcelain articles chiefly used for preparing, serving, or storing food or beverages: U.S. production (shipments), imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

Year	Production	Imports	Exports	Apparent consumption
	Quantity (1,000 dozen pieces)			
1964	1/ 649	11,629	24	12,254
1965	1/ 815	12,420	2/ 43	13,192
1966	1/ 778	12,722	2/ 50	13,450
1967	1/ 771	13,953	2/ 63	14,661
1968	1/ 774	18,407	2/ 51	19,130
1969	3/	21,874	2/ 52	3/
1970	3/	18,643	2/ 60	3/
	Value (1,000 dollars)			
1964	1/ 12,904	27,530	186	40,248
1965	1/ 19,412	30,614	2/ 250	49,776
1966	1/ 19,902	32,891	2/ 299	52,494
1967	1/ 21,273	35,257	2/ 368	56,162
1968	1/ 22,986	46,491	2/ 358	69,119
1969	3/	59,437	2/ 378	3/
1970	3/	56,311	2/ 389	3/

1/ Estimate based on data submitted to the Tariff Commission by domestic producers.
2/ Estimated.
3/ Not Available.

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

Table 3.--Hotel chinaware and subporcelain articles chiefly used for preparing, serving, or storing food or beverages: U.S. production (shipments), imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

Year	Production	Imports	Exports	Apparent consumption
	Quantity (1,000 dozen pieces)			
1964	1/	83	99	1/
1965	2/ 7,147	73	3/ 146	7,074
1966	2/ 8,003	147	3/ 167	7,983
1967	2/ 8,081	137	3/ 211	8,007
1968	2/ 7,996	253	3/ 172	8,077
1969	2/ 7,694	353	3/ 175	7,872
1970	1/	417	3/ 199	1/
	Value (1,000 dollars)			
1964	2/ 42,880	159	693	42,346
1965	2/ 38,952	152	3/ 676	38,428
1966	2/ 44,497	294	3/ 807	43,984
1967	2/ 46,548	274	3/ 995	45,827
1968	2/ 49,492	405	3/ 968	48,929
1969	2/ 55,033	848	3/ 1,021	54,860
1970	1/	864	3/ 1,050	1/

1/ Not available.

2/ Estimate based on data submitted to the Tariff Commission by domestic producers.

3/ Estimated.

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

CHINAWARE, HOTEL AND HOUSEHOLD, INCLUDING BONE CHINA

Table 4.--Hotel and household chinaware: U.S. exports of domestic merchandise, by principal markets, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Canada	87	147	161	215	138	141	158
Mexico	4	5	7	6	14	19	15
Bahamas	5	7	15	22	29	24	9
United Kingdom	1	2	-	2	1	-	10
Venezuela	3	5	5	4	4	4	6
France	1	1	-	-	1/	-	5
Jamaica	3	4	-	-	2	7	5
All other	19	18	29	25	35	32	51
Total	123	189	217	274	223	227	259
	Value (1,000 dollars)						
Canada	573	582	674	906	638	637	622
Mexico	35	45	62	51	85	133	98
Bahamas	35	60	108	143	236	264	96
United Kingdom	10	38	-	19	11	-	77
Venezuela	28	38	45	33	36	43	49
France	9	15	-	-	2	-	49
Jamaica	20	23	-	-	14	37	40
All other	169	125	217	211	304	285	408
Total	879	926	1,106	1,363	1,326	1,399	1,439

1/ Less than 500 dozen pieces.

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

Table 5.--Household chinaware (nonbone) and subporcelain articles chiefly used for preparing, serving, or storing food or beverages: U.S. imports for consumption, by principal sources, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Japan	9,774	10,497	10,913	11,961	15,915	19,011	15,713
West Germany	859	687	711	675	1,018	1/1,194	1,098
United Kingdom	54	63	87	72	86	89	76
Italy	10	13	13	16	22	25	34
All other	414	538	423	704	759	921	1,067
Total	11,111	11,798	12,147	13,428	17,800	21,240	17,988
	Value (1,000 dollars)						
Japan	17,825	19,861	21,630	23,532	32,215	42,649	38,180
West Germany	3,687	3,578	3,719	3,564	5,042	5,709	6,142
United Kingdom	537	563	773	758	826	910	877
Italy	108	152	168	171	211	208	320
All other	1,463	1,770	1,715	2,329	2,541	3,355	4,064
Total	23,620	25,924	28,005	30,354	40,835	52,831	49,583

1/ Data adjusted to compensate for incorrect quantities reported under item 533.66.

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

CHINAWARE, HOTEL AND HOUSEHOLD,
INCLUDING BONE CHINA

Table 6.--Household chinaware (nonbone) and subporcelain articles chiefly used for preparing, serving, or storing food or beverages: U.S. imports for consumption, by value classes, 1964-70

Item	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Household ware available in specified sets 1/ valued--							
Not over $10	998	1,351	1,923	1,061	1,501	921	437
Over $10, but not over $24	6,999	6,937	6,895	8,325	10,270	13,011	9,656
Over $24	588	1,005	1,136	1,362	2,011	2,933	2,854
Other, over $8	15	39	11	17	21	21	22
Subtotal	8,600	9,332	9,965	10,765	13,803	16,886	12,969
Household ware not available in specified sets:							
Steins, mugs, candy boxes, etc.	392	385	361	770	1,361	1,693	2,211
Other articles:							
Low value	1,724	1,790	1,506	1,571	2,134	1,976	2,144
Medium value	304	220	234	224	391	505	436
High value	91	71	81	99	112	180	228
Subtotal	2,511	2,466	2,182	2,664	3,998	4,354	5,019
Total	11,111	11,798	12,147	13,429	17,801	21,240	17,988
	Value (1,000 dollars)						
Household ware available in specified sets 1/ valued--							
Not over $10	1,372	2,032	2,855	1,503	2,350	1,543	692
Over $10, but not over $24	14,453	14,541	14,868	16,628	20,769	27,496	21,933
Over $24	3,752	5,665	6,526	7,636	10,677	14,572	15,844
Other, over $8	91	107	72	132	206	205	273
Subtotal	19,668	22,345	24,321	25,899	34,002	43,816	38,742
Household ware not available in specified sets:							
Steins, mugs, candy boxes, etc.	787	724	812	1,371	2,411	3,428	4,583
Other articles:							
Low value	1,538	1,495	1,323	1,412	2,009	2,157	2,406
Medium value	738	580	656	618	1,114	1,372	1,370
High value	889	780	894	1,056	1,299	2,058	2,482
Subtotal	3,952	3,579	3,685	4,457	6,833	9,015	10,841
Total	23,620	25,924	28,006	30,356	40,835	52,831	49,583

1/ This term is defined in headnote 2 of part 2, Schedule 5 of the TSUSA-1971, reproduced in appendix A of this volume.

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

Table 7.--Bone chinaware articles chiefly used for preparing, serving, or storing food or beverages: U.S. imports for consumption, by principal sources, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
United Kingdom	507	605	535	478	542	515	582
Japan	7	15	35	43	60	107	67
Ireland	2	1	2	1/	2	1	2
West Germany	1	1/	1	1	1	3	1
Other	1	1	2	3	2	8	3
Total	518	622	575	525	607	634	655
	Value (1,000 dollars)						
United Kingdom	3,865	4,605	4,629	4,566	5,117	5,721	6,012
Japan	11	64	211	314	503	808	631
Ireland	9	5	18	2	8	6	10
West Germany	6	2	5	6	5	10	9
Other	19	14	23	14	23	61	66
Total	3,910	4,690	4,886	4,902	5,656	6,606	6,728

1/ Less than 500 dozen pieces.

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

Table 8.--Hotel chinaware (nonbone) and subporcelain articles chiefly used for preparing, serving, or storing food or beverages: U.S. imports for consumption, by principal sources, 1964-70

Country	1964	1965	1966	1967	1968	1969	1970
	Quantity (1,000 dozen pieces)						
Brazil	1/	-	31	49	134	174	234
Japan	57	51	72	61	104	102	121
West Germany	8	6	13	10	4	61	27
United Kingdom	18	15	27	11	8	12	7
Other	1/	1	4	6	3	4	28
Total	83	73	147	137	253	353	417
	Value (1,000 dollars)						
Brazil	1/	-	32	87	187	270	325
Japan	81	70	110	89	153	172	256
West Germany	30	25	42	48	16	344	158
United Kingdom	48	50	86	39	24	36	21
Other	1/	7	24	11	25	26	104
Total	159	152	294	274	405	848	864

1/ Less than 500.

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

Commodity	TSUS item
Porcelain insulators with metal parts------	535.11
Other ceramic electrical ware----------	535.14, 535.15

Note.--For the statutory description see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

Estimated average annual consumption of ceramic electrical ware, well over 90 percent of which was supplied by domestic production, was valued at $166 million during 1964-69. During this period, the value of exports have steadily increased and, since 1967, exceeded the value of imports.

Description and uses

The articles in this summary cover a broad group of heterogeneous products made from many different ceramic materials. Included here are ceramic insulators, whether or not in part of metal for low- and high-voltage electrical transmission and distribution systems, ferro-electric and piezoelectric elements for electronics and electrical and mechanical devices, and ceramic electrical ware (excluding ferrites) for electronic and electrical devices.

Ferrites or ceramic magnets(item 535.12) used in computer memories, electronics, and electrical and mechanical devices are covered in another summary in this volume. Glass insulators (items 547.41-.43) are covered in a summary in volume 5:4; insulators of rubber and plastic (item 773.30) are discussed in a summary in volume 7:7.

Porcelain electrical insulators are most commonly used in transmission and distribution systems because they withstand weathering without attention and are resistant to damage from high temperatures. Generally, all insulators must meet rigid performance characteristics specified by electrical utility companies and equipment manufacturers. The more common types of transmission and distribution insulators include the suspension, pin, post, spool, and strain types and bushings. Many special shapes are made for specific application.

Other ceramic insulators, including specialized insulators used in electronic and electrical applications, are made chiefly from alumina, beryllia, cordierite, forsterite, steatite, magnesia, and zirconia. Alumina is the material most often used where good high frequency electrical properties, high physical strength and resistance to very high temperatures are required. Steatite, the most inexpensive material with good physical and electrical properties, is used where the requirements do not warrant alumina or higher grade insulating materials. Beryllia, used in the most expensive ceramic insulators, has the most rapid heat transferring ability of all ceramic materials.

Ferroelectric and piezoelectric elements are special ceramics having unique physical and electrical properties such as extremely high di-electric strength, the ability to change shape when electrically charged, and the ability to generate a measurable electric current when physical pressure is applied to the element. They are made from barium titanates, niobates, tantalates, zirconium titanates, and other materials in the shapes of discs, tubes, cylinders, plates, spheres, hemispheres, bars and rods.

High voltage transmission and distribution insulators are used in transmission and distribution lines, in electrical substations and transformers, fuse boxes, and light fixtures. Other insulators are used as electronic substrates, tube bases, seals, heat sinks, resistor rods and cores, electronic envelopes, posts, and parts of spark plugs and automotive ignition switches. Ferroelectric and piezoelectric elements are used as dielectrics in capacitors, and as parts of transducers, pressure sensing devices, ultrasonic cleaning equipment, sonars, hydrophones, and phonograph cartridges.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Ceramic electrical insulators whether or not in part of metal, and other ceramic electrical ware, including ferroelectric and piezoelectric ceramic elements:			
535.11	Porcelain insulators, with metal parts cemented thereto and comprising not less than 30 percent of the weight thereof, used in high-voltage, low-frequency electrical systems	15% ad val.	1/	1/
535.14	Other	30% ad val.	18% ad val.	15% ad val.
535.15 2/	If Canadian article and original motor-vehicle equipment	Free	1/	1/

1/ Rate of duty not affected by trade conference.
2/ Classification became effective January 18, 1965.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent

(see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

The duty-free treatment of Canadian articles for original motor-vehicle equipment (item 535.15) was established pursuant to concessions in the United States-Canadian automotive agreement signed in January 1965. From August 31, 1963, through January 17, 1965, imports from Canada of ceramic electrical ware for use as original motor-vehicle equipment had been dutiable at 30 percent ad valorem under item 535.14.

U.S. consumption

Consumption of ceramic electrical ware increased significantly during the period 1964-68 (table 1). Annual consumption is estimated to have increased in value from $111 million in 1964 to about $199 million in 1968. Consumption declined to about $187 million in 1969.

Consumption of almost all types of ceramic electrical ware is believed to have increased during the period 1964-68. The use of transmission and distribution insulators, which accounted for over half of total consumption in 1963, increased sharply in late 1964 and is believed to have accounted for most of the increase in consumption of ceramic electrical ware in the 1965-68 period. While consumption of alumina products for electronic uses has grown rapidly, consumption of all remaining products is believed to have increased only moderately.

The consumption of transmission and distribution insulators expanded rapidly in late 1964 due to electrical utility companies advancing their construction plans and the sharp increase in the construction of inter-regional extra high-voltage transmission lines and their associated supporting equipment. This trend has continued with the emphasis on long distance transmission of electricity from remote locations and the push toward inter-regional tie-ins for economy purposes. It is expected that this development will continue for some time to come and the consumption of distribution insulators will become more important as local growth increases.

U.S. producers

Ceramic electrical ware was produced in 74 establishments in 1967; transmission and distribution equipment was produced in 15 of these establishments, spark plugs in 5, and a variety of ceramic electrical ware in the remaining establishments.

Much of the ware is produced in captive operations. Most of the transmission and distribution insulators are made by heavy electrical equipment manufacturers, principally for incorporation into their own equipment. Likewise, almost all spark plug insulators are made by spark plug manufacturers. Several large electronic and communications equipment firms produce most of their requirments of electronic ceramics; some produce this ware for sale on the open market. Most of the specialized insulators and other electrical and electronic ceramics are produced by independent fabricators.

Existing production facilities were expanded substantially and several new plants were established during the period 1964-67. Two of the largest producers of transmission and distribution insulators opened new plants, and one new producer started production. A number of new plants for making other ceramic electrical insulators, both captive and independent, were established during this period. Most of the new independent establishments were relatively small.

U.S. production

U.S. production of ceramic electrical ware rose during the period 1964-68, paralleling the apparent increase in consumption. The estimated value of production in 1964 was $119 million, compared with $200 million in 1968 (table 1). Production, however, declined to $194 million in 1969.

U.S. exports

Annual exports of ceramic electrical ware increased steadily in value from $9.5 million in 1964 to $17.1 million in 1970 (table 2). Exports of "wet process" porcelain, which consists almost entirely of the transmission and distribution insulators, varied between $1.5 and $2.5 million annually during 1964-70. Steatite and other electrical ceramic exports increased annually from $7 million in 1963 to nearly $15 in 1970.

During 1970 the United States exported to over 45 countries. The United Kingdom was the most important market, accounting for about 24 percent of all types of exports, most of which were specialized ceramic insulators. Exports to Canada accounted for 16 percent of the total. Shipments to Belgium, which amounted to 14 percent of total U.S. exports, consisted entirely of specialized ceramic insulators.

U.S. imports

Imports of ceramic electrical ware, which amounted to less than $1 million annually before 1964, increased sharply and reached a high of $14.5 million in 1967, but declined in 1968 to $10.9 million and to $8.6 million in 1970 (table 1). Imports of transmission and distribution insulators, principally those consisting of 30 percent or more metal by weight, accounted for the major part of annual imports. In 1970, imports of these insulators amounted to $4.2 million. Imports of "other" ceramic electrical ware, principally piezoelectric and ferroelectric elements, increased steadily from $100,000 in 1964 to $700,000 in 1967, declined to $633,000 in 1968, increased somewhat in 1969, but further declined to $431,000 in 1970.

Japan has been the principal source of these articles since 1962, and in 1970 accounted for 85 percent of the total value of imports (table 3). Canada supplied 4 percent, and France and West Germany supplied 1 percent each.

Table 1.--Ceramic electrical ware (except ferrites): U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

(In thousands of dollars)

Year	Production 1/	Imports	Exports	Apparent consumption
1964	119,000	1,947	9,538	111,409
1965	142,000	4,628	10,120	136,508
1966	168,000	14,039	11,321	170,718
1967	188,400	14,469	11,925	190,944
1968	200,000	10,859	12,341	198,518
1969	194,000	7,155	14,602	186,553
1970	2/	8,585	17,079	2/

1/ Partially estimated to exclude shipments of ferrites.
2/ Not available.

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

Table 2.--Ceramic electrical ware (except ferrites): U.S. exports of domestic merchandise, by principal markets, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
United Kingdom	2,380	2,159	2,491	2,872	2,828	3,297	4,131
Canada	3,149	3,429	4,130	3,921	3,657	3,880	2,675
Belgium	13	34	443	660	1,017	1,530	2,319
Mexico	1,104	784	845	686	736	1,242	1,461
France	189	312	486	358	309	467	912
Australia	288	517	289	340	287	526	663
Republic of South Africa	195	269	214	323	328	188	447
Argentina	111	214	418	126	134	210	320
Pakistan	344	97	113	209	42	262	217
Venezuela	181	191	166	302	497	173	215
India	150	321	77	80	25	54	93
Brazil	98	80	126	252	171	75	80
All other	1,336	1,713	1,523	1,796	2,310	2,698	3,546
Total	9,538	10,120	11,321	11,925	12,341	14,602	17,079

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

Table 3.--Ceramic electrical ware (except ferrites): U.S. imports for consumption, by principal sources, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
Japan	1,858	4,336	12,207	10,865	8,921	5,752	7,316
Canada	21	180	1,184	1,633	620	279	331
France	4	-	236	459	188	205	123
West Germany	20	44	74	170	349	187	111
Italy	24	30	154	387	95	66	25
All other	20	38	184	955	686	1/ 666	2/ 679
Total	1,947	4,628	14,039	14,469	10,859	7,155	8,585

1/ Includes imports, valued at $529,000, from the United Kingdom.
2/ Includes imports, valued at $608,000, from the United Kingdom.

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

Commodity	TSUS item
Ferrites	535.12

Note.--For the statutory description see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States is the largest producer and consumer of ferrites. In 1967 the value of production is estimated to have been between $50 and $100 million. Imports and exports were relatively unimportant, each being equivalent to less than 5 percent of domestic consumption.

Description and uses

Ferrites, also referred to as ceramic magnets, are specialized ceramics having magnetic properties. They are made by sintering a mixture of high purity iron oxides plus varying amounts of oxides or carbonates of other metals, principally aluminum, barium, cobalt, copper, lead, manganese, nickel, strontium, and zinc. Ferrites have high magnetic permeability, although they may be either strongly or weakly magnetic, and in some the magnetic field can be reversed by the use of an outside magnetic force. Other important physical properties include high electrical resistance and low electrical loss.

The magnetic properties of ferrites are controlled by composition and manufacturing techniques. The strongest permanent magnets are made by wet pressing to shape in the presence of a strong magnetic field; weaker magnets are formed by dry pressing similar material without the use of an outside magnetic field. Memory cores, which are small and must be exceptionally reliable, are formed by utilizing refined extrusion and pressing techniques. Most other ferrite articles are formed by dry pressing. Ferrites are usually used without further processing; however, close tolerances are achieved by machining the unsintered articles or grinding the fired articles.

Ferrites are usually grouped into four general categories based on use: (1) memory cores for computers, (2) ferrite cores for consumer electronic products, primarily radio and television sets, (3) parts for commercial transmitting and telecommunications apparatus, and (4) permanent magnets. The most important use of ferrites is for the storage of information bits in computer memories. They are also used as magnetic switches in electronic equipment, cores for flyback and deflection yokes on TV sets, transformer cores,

magnetic induction fields in small motors, parts of loudspeakers, electronic filters, permanent magnets, and radio antennas.

Ferrites cannot be used interchangeably with other magnetic materials and devices such as metallic and electromagnets without substantial modification of the devices incorporating these components. Flexible magnets and grounding straps (which consist of ferrite powder and plastic or rubber binders), metallic magnets, and electromagnets are discussed in another volume of summaries covering items 682.70 - .91.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
535.12	Ferrites	15% ad val.	9% ad val.	7.5% ad val.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

Comment

Ferrite, a relatively new product, first became commercially available in the late 1940's. The first ferrites, which were weakly magnetic, were used primarily in computer memories and electronics. About 1955, permanent magnets were introduced commercially. Since then the ferrite markets have shown continued growth as new materials have been introduced and producers and users have innovated and adapted the product to their specific requirements.

In 1967, ferrites were produced by 16 manufacturers operating 19 establishments. A large portion of total production was made in

essentially captive operations, owned principally by electronics and telecommunications equipment producers. Several of the independent producers made other products such as electrical porcelains, specialty steels, and metallic magnets.

The value of total production and consumption of ferrites is unknown. However, they are believed to have increased rapidly between 1963 and 1967, reaching between $50 and $100 million in 1967. The use of ferrite cores in computer memories is the largest single use and has accounted for a large share of the growth. Production of ferrite memory cores has continued to grow because advanced production techniques have kept pace with the demand for more rapid memory readout. However, manufacture of ferrite cores for consumer electronic products has fallen off both in terms of value and of quantity (see table 1). This seems due largely to a decline in domestic manufacture of television sets after 1966, which has provided the most important market for these cores.

The change from mechanical to electronic switching devices--which have much greater speed--has created a strong demand for ferrites in telecommunication and electronic machines. Replacement of induction coils with ceramic magnets, e.g., in small electric motors for starting automobiles and for other light duty uses, has grown rapidly. The motors are generally smaller and less expensive than those replaced.

U.S. exports of ferrites are small relative to domestic production and consist mostly of memory cores that are sent abroad to be assembled into memory frames which are then exported to the United States.

U.S. imports of ferrites increased from 199 million pieces, valued at $2.4 million in 1966 to 416 million pieces, valued at $2.7 million in 1969, then declined to 268 million dozen pieces valued at $3.5 million in 1970. (table 2). In 1966-70 the Netherlands was, by far, the most important source of imports, accounting for 77 percent of the quantity and 35 percent of the value. Imports from the Netherlands consisted almost entirely of memory cores. Imports in 1966-70 from West Germany and Japan, which accounted for 28 percent and 31 percent of the value, respectively, consisted of memory cores, electronic parts, and permanent magnets.

FERRITES

Table 1.--Ferrite cores of the type used in consumer electronic products: U.S. shipments, 1965-69 and January-June 1969 and 1970

Year or Period	Quantity	Value
	1,000 pieces	1,000 dollars
1965	140,408	14,515
1966	210,119	22,340
1967	174,075	17,277
1968	194,458	16,989
1969	184,862	15,700
January-June:		
1969	100,550	8,007
1970	66,980	6,489

Source: Compiled from reports submitted to the U.S. Tariff Commission by U.S. producers.

Note.--The data are believed to represent more than 95 percent of U.S. shipments of the types of ferrite cores specified.

Table 2.--Ferrites: U.S. imports for consumption, by principal sources, 1966-70

Country	1966	1967	1968	1969	1970
	Quantity (1,000 pieces)				
Japan	26,111	17,932	30,622	23,977	23,992
West Germany	7,344	1,864	3,900	5,928	29,096
Netherlands	165,021	241,833	177,592	378,727	85,342
Hong Kong	-	-	- -	4,050	127,114
All other	171	376	563	3,665	2,187
Total	198,647	262,005	212,677	416,347	267,731
	Value (1,000 dollars)				
Japan	869	689	585	849	1,214
West Germany	813	448	629	618	1,209
Netherlands	667	977	1,343	1,066	733
Hong Kong	-	-	-	2	140
All other	22	80	138	192	225
Total	2,371	2,194	2,695	2,727	3,521

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

Commodity	TSUS item
Laboratory and industrial chemical ware of:	
Porcelain and subporcelain	535.21
Stoneware	535.24
Other	535.27

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States is self-sufficient in the production of laboratory and industrial chemical ware and is a net exporter. The value of annual consumption is estimated at about $8 to $12 million during 1965-70. Exports in 1970 are estimated at slightly less than $1 million; imports amounted to $99 thousand.

Description and uses

The laboratory and industrial chemical ware here considered includes articles, apparatus, and equipment made from porcelain, subporcelain, stoneware, and other ceramic bodies. 1/ Chemical porcelain is used for laboratory apparatus, the more important pieces of which are mortars and pestles, filtration funnels, crucibles, and evaporating dishes. Chemical stoneware includes such chemical processing equipment as laboratory sinks, pipe, valves, vacuum filters, and absorption towers and packing rings. Filters and porous membranes are made from earthenware and other porous ceramics.

Similar articles made from glass, fused silica, and fused quartz are covered by items 547.53-.57 in summaries volume 5:4. Articles made from platinum, stainless steel, and other metals, porcelain enameled metals, rubber, and plastic are included in other summaries volumes describing metallic containers (item 640.35), articles not specially provided for in chief value of metal (items 656.05 - 658.00), and rubber and plastic articles (parts 12C and D of schedule 7 of the TSUS).

Ceramic laboratory and industrial chemical ware does not corrode or dissolve, nor does it contaminate gases or chemical solutions. Such ware is resistant to attack from both strong acids and weak to moderate strength bases. Laboratory apparatus made of porcelain and subporcelain is resistant to thermal and physical shock; however, articles made from stoneware are only moderately resistant.

1/ For the applicable definitions of porcelain, subporcelain, stoneware, and other ceramic materials, see headnote 2 to part 2, schedule 5 of TSUSA-1971 in Appendix A of this volume.

The primary users of these products are the petroleum, chemical, and metals refining industries. Laboratory apparatus is also used in secondary schools, colleges, and industrial research and development laboratories.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Laboratory and industrial chemical ware, of ceramic ware:			
535.21	Of porcelain or of subporcelain.	60% ad val.	36% ad val.	30% ad val.
535.24	Of stoneware----	40% ad val.	24% ad val.	20% ad val.
535.27	Other----------	20% ad val.	12% ad val.	10% ad val.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from concessions granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. These concessions amount to total reductions of 50 percent (see pertinent sections of the TSUSA-1971), reproduced in appendix A, for rates of the five annual stages).

Comment

U.S. consumption of ceramic laboratory and industrial chemical ware is estimated to have been valued at $8 to $12 million annually during 1966-70. During the period, annual consumption of porcelain and subporcelain laboratory apparatus accounted for a value of between $1.5 and $2 million. Virtually all of the remaining value of consumption is for industrial purposes. Ceramic chemical ware is essential in many laboratory and industrial processes and frequently does not have any economical substitutes.

Most porcelain laboratory ware is sold by laboratory supply houses that market a broad line of laboratory products. Stoneware and industrial porcelains, however, are usually sold through direct manufacturer-user contact.

Ceramic laboratory and industrial chemical ware was manufactured by 15 to 20 U.S. producers during 1966-67. Most of the production of porcelain laboratory apparatus was made by one company located in Colorado; small quantities were made by several producers of ceramic electrical, electronic, and machinery parts. About 15 firms make chemical porcelain and stoneware; two Ohio firms make full lines of products including tower packing and account for most domestic production. The remaining firms make a limited line of products.

Annual U.S. factory shipments of ceramic chemical ware, valued at about $9 to $13 million, were about $1 million larger than the value of annual consumption during 1966-67. Laboratory apparatus shipments are estimated to have been valued at $2 million in 1967, an increase of about $500,000 over the estimate for 1963.

U.S. exports of laboratory and industrial chemical ware are estimated to have been about $1 million annually, or about 8 to 12 percent of production during 1966-67. Shipments consisted mainly of chemical stoneware and tower packing. Canada was the most important export market.

U.S. imports, which are small relative to domestic consumption and production, decreased from a value of $197,000 in 1966 to $99,000 in 1970 (see following table). Japan has been the principal source.

Ceramic chemical ware: U.S. imports for consumption, by principal sources, 1966-70

(In thousands of dollars)

Country	1966	1967	1968	1969	1970
West Germany	11	18	13	17	53
Japan	158	43	41	62	20
Canada	20	29	28	18	18
France	4	19	20	3	18
All other	4	9	11	-	10
Total	197	118	113	100	99

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

Commodity	TSUS item
Ceramic sanitary ware, including plumbing fixtures, bathroom accessories, and parts	535.31

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The value of U.S. consumption of ceramic sanitary ware, during 1964-68, averaged about $154 million a year. Exports were more than four times as great as imports and were equivalent to about 3 percent of U.S. production.

Description and uses

Ceramic sanitary ware includes plumbing fixtures in chief value of ceramic ware such as water closet bowls, flush tanks, lavatories, water fountains, and urinals, and bathroom accessories such as soap dishes, towel bars, paper holders, tumbler and toothbrush holders, and faucet handles.

Plumbing fixtures made from porcelain enameled steel and cast iron and metal bathroom accessories such as items 653.85, 653.97 and 654.20 are discussed in summaries covered by Schedule 6. Any rubber and plastic sanitary ware within parts 12(C) and (D) of Schedule 7 of the TSUS is included in the appropriate summaries for that schedule.

Ceramic sanitary ware is made from chinaware (including porcelain) or earthenware. 1/ Most plumbing fixtures manufactured for use in the United States are made from chinaware, whereas ceramic bathroom accessories are made from both chinaware and earthenware. All ceramic sanitary ware is glazed for ease of cleaning and surface protection.

Plumbing fixtures are generally cast in several component pieces, assembled and finished by hand, then fired. Bathroom accessories are usually made by casting a complete unit which is fired after finishing and glazing by hand.

There has been little change in the basic designs and operating efficiency of sanitary ware for several decades. Most individual types of sanitary ware, regardless of the source, are basically the same and are intended for the same uses.

1/ For the applicable definitions of porcelain, china, and earthenware see headnote 2 to part 2, Schedule 5 of the TSUSA-1971 in appendix A of this volume.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
535.21	Sanitary ware, including plumbing fixtures and bathroom accessories, all the foregoing, and parts thereof, of ceramic ware----	28% ad val.	17.5% ad val.	15% ad val.

The rate in effect prior to January 1, 1968, was established by Presidential Proclamation 3744, effective Oct. 1, 1966, and modified the 30 percent rate previously in effect under the TSUS from August 31, 1963 (see historical notes to Part 2, Schedule 5 of the TSUSA-1971 in appendix A of this volume). The rates in effect for the fourth and final stages reflect duty modifications resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent in the July 1962 rate of duty (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

U.S. consumption

The value of apparent annual U.S. consumption of ceramic sanitary ware increased from $149 million in 1964 to nearly $166 million in 1968 (table 1).

Consumption of plumbing fixtures, which normally comprise nearly 90 percent of U.S. annual consumption of ceramic sanitary ware, fluctuated between $133.2 and $137.7 million during the period 1964 to 1967, increased to $150 million in 1968 and further increased to $164 million in 1969. Consumption of bathroom accessories amounted to about $9.7 million in 1964; estimated

consumption in recent years has ranged between $12 million in 1967, and $17 million in 1966.

U.S. producers

Ceramic sanitary ware was produced by 34 firms in 51 establishments employing 8,400 people in 1967. Twenty-two firms operating 36 plants accounted for all of the production of plumbing fixtures. The five largest firms supplied about three-fourths of the market. Thirteen firms that produced ceramic plumbing fixtures also produced porcelain enameled, cast iron, and steel sanitary fixtures. Ceramic plumbing fixtures were made in 16 states; however, production is concentrated in California, Illinois, Indiana, New Jersey, Ohio, Pennsylvania, South Carolina, Texas, and Wisconsin.

Most of the U.S. output of ceramic bathroom accessories was made as secondary products by about 12 producers; 4 of these firms manufacture ceramic tile, and several other producers make bathroom accessories from competing materials.

U.S. production

Shipments of ceramic sanitary ware by U.S. producers increased from $154.9 million in 1964 to $158.7 million in 1966, declined to $149.1 million in 1967 then increased to $168.5 million in 1968 (table 1). Annual shipments of plumbing fixtures declined from 13.2 million units, valued at $144.3 million in 1964 to 11.9 million units, valued at $137.8 million in 1967, then increased to 13.6 million units, valued at $154.0 million in 1968. In 1969, shipments amounted to 14.6 million units, valued at nearly $168 million. Shipments of water closet bowls accounted for 44 percent of the total number of units in 1968; flush tanks for 38 percent; lavatories for 18 percent; and urinals and water fountains for the remainder.

Shipments of bathroom accessories increased annually from $8.8 million in 1964 to $16.2 in 1966, dropped to $11.3 million in 1967, and then increased to $14.5 million in 1968.

U.S. exports

Exports of sanitary ware were about 3 percent of total annual domestic shipments in the 1964-69 period.

Bathroom accessories, which are not an important export item, were valued at $102,000 in 1964; export data are not available for later years.

Exports of ceramic plumbing fixtures have exceeded imports for many years (table 2). Annual exports averaged about $5 million during

1964-69. Canada, the most important export market, usually accounts for over 20 percent of annual exports. Other important markets are Mexico, Peru, the Bahamas, and Central America.

U.S. imports

Imports of sanitary ware, which are generally like and comparable with that produced in the United States, have long been small relative to domestic shipments. In 1968, imports, based on value, accounted for about 0.9 percent of apparent domestic consumption. Imports of plumbing fixtures accounted for nearly 0.2 percent of the consumption of such items; however, imported bathroom accessories are estimated to have supplied about 15 percent of the domestic consumption of such ware during 1964-68.

Japan is the principal source of sanitary ware supplying, by value, about 83 percent of the bathroom accessories and 86 percent of the plumbing fixtures in 1968 (tables 4 and 5).

Table 1.--Ceramic sanitary ware: U.S. factory shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

(In thousands of dollars)

Year	Shipments	Imports	Exports 1/	Apparent consumption
1964	154,945	1,081	6,806	149,220
1965	158,314	1,277	4,876	154,715
1966	158,653	1,175	5,194	154,634
1967	149,100	1,001	4,826	145,275
1968	168,500	1,428	4,256	165,672
1969	2/	2,460	4,603	2/
1970	2/	2,132	4,961	2/

1/ Plumbing fixtures only beginning in 1965. Plumbing fixtures usually account for over 97 percent of the total exports of ceramic sanitary ware.

2/ Not available.

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

Table 2.--Ceramic plumbing fixtures: U.S. factory shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

Year	Shipments 1/	Imports	Exports	Apparent consumption
	Quantity (1,000 units)			
1964	13,205	204	516	12,893
1965	12,804	82	2/	3/
1966	12,489	68	2/	3/
1967	11,940	59	2/	3/
1968	13,641	86	2/	3/
1969	14,627	224	2/	3/
1970	3/	241	2/	3/
	Value (1,000 dollars)			
1964	144,328	117	6,705	137,740
1965	140,889	164	4,876	136,177
1966	138,730	176	5,194	133,712
1967	137,818	188	4,826	133,180
1968	153,970	233	4,256	149,947
1969	167,935	706	4,603	164,038
1970	3/	740	4,961	3/

1/ Shipments of vitreous china plumbing fixtures, including small amounts of semivitreous (earthenware) fixtures classed with concrete and composition fixtures.

2/ Quantity not reported.

3/ Not available.

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

Table 3.--Ceramic bathroom accessories: U.S. factory shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1964-70

(In thousands of dollars)

Year	Shipments	Imports	Exports	Apparent consumption
1964	8,800	954	102	9,652
1965	15,755	1,113	1/	1/
1966	16,238	999	1/	1/
1967	11,282	813	1/	1/
1968	14,530	1,195	1/	1/
1969	1/	1,753	1/	1/
1970	1/	1,392	1/	1/

1/ Not available.

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

Table 4.--Ceramic sanitary ware: U.S. imports for consumption, by principal sources, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
Japan	1,005	1,167	1,011	842	1,207	1,560	1,235
Mexico	37	31	24	19	47	424	661
Canada	4	38	73	67	78	45	68
Italy	15	18	18	11	23	28	52
United Kingdom	9	9	39	39	40	116	29
All other	11	14	10	23	33	1/ 287	87
Total	1,081	1,277	1,175	1,001	1,428	2,460	2,132

1/ Includes imports, valued at 240 thousand dollars, from Colombia.

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

Table 7.--Ceramic bathroom accessories: U.S. imports for consumption, by principal sources, 1964-70

(In thousands of dollars)

Country	1964	1965	1966	1967	1968	1969	1970
Japan	886	1,023	854	681	995	1,261	1,064
Mexico	33	29	21	19	42	169	149
Canada	2	25	64	42	72	33	59
United Kingdom	9	9	39	38	34	59	25
Italy	15	14	13	11	21	17	21
All other	9	13	8	22	31	1/ 214	74
Total	954	1,113	999	813	1,195	1,753	1,392

1/ Includes imports, valued at 172 thousand dollars, from Colombia.

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

Commodity	TSUS item
Porcelain and subporcelain machinery parts 1/----------	535.41

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

The United States is largely self-sufficient in the production of porcelain and subporcelain machinery parts. The value of domestic consumption is estimated to be about $10 million annually. Imports accounted for about 6 percent of consumption in 1968; exports are believed to have been equal to imports.

Description and uses

Machinery parts made from porcelain and subporcelain 2/ usually have a high degree of chemical inertness and resistance to abrasion and mechanical impact. They also have high tensile strength, relatively high specific gravity, rapid heat transmission, and maintain their strength at high temperatures. Machinery parts are usually made from high alumina porcelains, frequently of the same compositions as electrical porcelains, although some parts are made from steatite and clay-based porcelain.

The principal machinery parts covered by this summary include grinding media and mill lining blocks used by the chemical, ceramic, plastic, cement, and paint-pigment industries to control contamination; pump parts, such as valves and plungers, used by the petroleum and chemical industries to handle corrosive materials; extrusion dies used to shape and form metals; textile thread guides used in the spinning and weaving of natural and man-made fibers; sprayer tips used in agriculture equipment to apply fertilizers and insecticides; porcelain tool tips used in various machines, such as lathes and boring mills, for cutting metal; and forms used in making rubber gloves and balloons.

1/ The Customs Court (C.D. 4021) held that porcelain tool tips were dutiable under TSUS item 535.41.

2/ For the applicable definitions of porcelain and subporcelain, see headnote 2 to part 2, schedule 5 of the TSUSA-1971 in Appendix A of this volume.

Machinery parts of other materials provided for in Schedule 5 are covered by summaries in volumes 5:1 and 5:4. Machinery parts of leather or fur on the skin are covered in the summaries in Volume 7:1. Other machinery parts are covered in the summaries in volume 6:8.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
535.41	Machinery parts, of porcelain or of subporcelain.	14% ad val.	8% ad val.	7% ad val.

The rate in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in appendix A, for rates of the five annual stages).

Comment

The value of domestic consumption of machinery parts is believed to have been about $10 million in 1967 and expanding moderately. Grinding media and mill lining block accounted for about 40 percent of the total. Another 20 percent each was accounted for by textile thread guides and cutting tools.

Production of machinery parts is not separately enumerated in official statistics but the value of such output is estimated to have been about $10 million in 1967, and probably nearly $12 million in 1968.

Machinery parts are made by an estimated 30 to 40 producers. Seven or eight concerns account for virtually all the domestic production; one manufacturer is believed to account for over half. Machinery parts account for the major part of production of only two of the firms. All other firms, including the largest manufacturer, account for a minor share of production. Most of the producers also make electrical porcelain.

Exports, which are not separately reported, probably amount to less than $1 million annually.

Imports, which consist mainly of textile thread guides and grinding media, increased from $647 thousand in 1966 to $838 thousand in 1967, decreased to $703 thousand in 1968, then increased again to $1.2 million in 1970 (see following table). Most imports are similar to domestic articles. West Germany supplied over 50 percent of the 1970 imports; the United Kingdom accounted for most of the remainder.

Machinery parts of porcelain and subporcelain: U.S. imports for consumption by principal sources, 1966-70

(In thousands of dollars)

Country	1966	1967	1968	1969	1970
West Germany	330	643	497	748	591
United Kingdom	285	177	172	284	474
Japan	28	9	3	24	15
Other	4	11	31	75	79
Total 1/	647	838	703	1,131	1,159

1/ Because of rounding, figures may not add to the totals shown.

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

Commodity	TSUS item
Ceramic articles and wares, not elsewhere enumerated	536.11-.15

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1971).

U.S. trade position

Consumption of the miscellaneous ceramic articles and wares covered by this summary is believed to be small; exports were probably negligible. Annual imports during 1966-70 averaged $241,000.

Description and uses

The ceramic articles and wares 1/ covered in this summary include, among other things, mandrels; evaporator plates for use in humidifiers; porcelain dental shade guides; Gazal process plugs, used to inject air into molten metals; porcelain stoppers for laboratory bottles; fused cast basalt shapes, used as abrasion resistant linings in cyclones, sluiceways, and blowers; earthenware molds; and dielectric raceways.

1/ For the applicable definitions of ceramic wares, see the headnotes to part 2 of Schedule 5 of the TSUSA-1971, reproduced in Appendix A of this volume.

U.S. tariff treatment

The column 1 (trade-agreement) rates of duty applicable to imports (see general headnote 3 in the TSUSA-1971) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	U.S. concessions granted in 1964-67 trade conference (Kennedy Round)	
			Fourth stage, effective Jan. 1, 1971	Final stage, effective Jan. 1, 1972
	Ceramic wares, and articles of such wares not specially provided for:			
536.11	Of porcelain or of subporcelain.	45% ad val.	27% ad val.	22.5% ad val.
536.15	Other	20% ad val.	1/	1/

1/ Rate of duty not affected by trade conference.

The rates in effect prior to January 1, 1968 had remained unchanged under the TSUS from August 31, 1963 through 1967. The rates in effect for the fourth and final stages reflect duty modifications on item 536.11 resulting from a concession granted by the United States in the Kennedy Round trade negotiations under the General Agreement on Tariffs and Trade. This concession amounts to a total reduction of 50 percent (see pertinent sections of the TSUSA-1971, reproduced in Appendix A, for rates of the five annual stages).

Comment

Statistics are not available on production, exports, or consumption of these miscellaneous articles and wares; production and consumption are believed to be small while exports are probably negligible. Except in the case of cermets, domestic production is by concerns producing other ceramic articles. Such output of miscellaneous articles and wares is only a small part of their production.

Imports of ceramic articles, not specially provided for, including wares, have been small in relation to other ceramic articles. Imports increased during 1966-70 from $135,000 in 1966 to a high of $436,000 in 1970 (see following table). West Germany, Japan, the United Kingdom, France, and Italy were the principal suppliers.

CERAMIC WARES, AND ARTICLES OF SUCH WARES, NOT ELSEWHERE ENUMERATED

Ceramic articles and wares, not elsewhere enumerated: Imports for consumption, by principal sources, 1966-70

(In thousands of dollars)

Country	1966	1967	1968	1969	1970
West Germany	20	11	94	77	282
United Kingdom	4	2	24	34	38
Japan	25	29	20	31	37
France	11	26	40	37	36
Italy	57	22	12	46	23
Canada	7	15	9	12	4
All other 1/	11	2/ 38	10	43	16
Total	135	143	209	280	436

1/ Excludes imports, valued at $252,000 (in 1966), from Hong Kong, that are believed to be U.S. products assembled abroad.

2/ Includes imports, valued at $27,000, from Mexico.

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 (1971): 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.

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 sama 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

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1971)

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS

278

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. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	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. Suf-fix	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 those components is the greater by weight.			
		Refractory magnesia, including dead-burned magnesite, fused magnesite, and dead-burned dolomite:			
531.01	00	Not containing lime or containing by weight not over 4 percent lime	S. ton	0.22¢ per lb.	0.75¢ per lb.
531.04	00	Containing by weight over 4 percent lime	S. ton	7% ad val.	30% ad val.
531.11	00	Refractory and heat-insulating mortars, ramming mixes and castables; super-refractory powders	Lb	9% ad val.	30% ad val.
		Refractory and heat-insulating bricks of all sizes and shapes:			
531.21	00	Chrome bricks	Lb	15% ad val.	25% ad val.
531.24	00	Magnesite bricks	Lb	0.2¢ per lb. + 3% ad val.	0.75¢ per lb. + 10% ad val.
531.27	00	Other bricks	M	0.5% ad val.	25% 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 articles	No	9% ad val.	45% ad val.
531.35	00	Earthenware and stoneware crucibles	No	6% ad val.	15% ad val.
531.37	00	Porcelain and subporcelain refractory articles	No	22.5% ad val.	60% ad val.
531.39	00	Other	X	9% ad val.	30% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart B. - Ceramic Construction Articles			
		Subpart B headnotes:			
		1. This subpart does not include -- (i) refractory and heat-insulating articles (see subpart A of this part); or (ii) laboratory and industrial chemical ware, electrical ware, and sanitary ware and parts thereof (see subpart D of this part).			
		2. For the purposes of this subpart -- (a) no article 1.25 inches or more in thickness shall be regarded as a tile; and (b) the term "construction articles" means ceramic ware and articles of such ware such as, but not limited to, bricks, tiles, friezes, mantels, sewer and drain pipes and fittings therefor, flue linings, and hollow building blocks, chiefly used in the construction of buildings and other structures.			
		Ceramic bricks:			
532.11	00	Not coated in whole or in part with engobe, glaze, or enamel	M	10¢ per 1,000	$1.25 per 1,000
532.14	00	Coated in whole or in part with engobe, glaze, or enamel	M	3.5% ad val.	6% ad val.
		Ceramic tiles:			
		Floor and wall tiles:			
532.21		Mosaic tiles		24.5% ad val.	55% ad val.
		Tiles in bulk (not mounted); and tiles in sheets having per sq. ft. not over 300 tiles, most of which have faces bounded entirely by straight lines:			
	20	*Glazed*	*Sq. ft.*		
	40	*Other*	*Sq. ft.*		
	60	*Other*	*Sq. ft.*		
		Other:			
532.24	00	Glazed	Sq. ft.	22.5% ad val.	55% ad val.
532.27	00	Other	Sq. ft.	24% ad val.	50% ad val.
532.31	00	Other tiles, including roofing tiles	Sq. ft.	16% ad val.	55% ad val.
532.41	00	Friezes, mantels, and other construction articles, all the foregoing, of ceramic tiles	X	7% ad val.	50% ad val.
532.61	00	Other construction articles	X	9% ad val.	30% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Subpart C. - Table, Kitchen, Household, Art and Ornamental Pottery			
		Subpart C headnotes: 1. This subpart covers ceramic articles chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients; and certain smokers', household, and art and ornamental articles of ceramic ware. This subpart does not cover -- (i) smokers' articles provided for in part 9B of schedule 7; (ii) other articles specifically provided for in schedule 7 or elsewhere in the schedules. 2. (a) For the purposes of this subpart, the term "available in specified sets" (items 533.23, 533.25, 533.26, 533.28, 533.63, 533.65, 533.66, 533.68, and 533.69) embraces plates, cups, saucers, and other articles chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients, which are sold or offered for sale in the same pattern, but no article is classifiable as being "available in specified sets" unless it is of a pattern in which at least the articles listed below in (b) or (c) of this headnote are sold or offered for sale. (b) If each of the following articles is sold or offered for sale in the same pattern, the classification hereunder in item 533.23, 533.25, 533.26, 533.28, 533.63, 533.65, 533.66, or 533.68, of all articles of such pattern shall be governed by the aggregate value of the following articles in the quantities indicated, as determined by the appraiser under section 402 of the Tariff Act of 1930, as amended, whether or not such articles are imported in the same shipment: 12 plates of the size nearest to 10.5 inches in maximum dimension, sold or offered for sale, 12 plates of the size nearest to 6 inches in maximum dimension, sold or offered for sale, 12 tea cups and their saucers, 12 soups of the size nearest to 7 inches in maximum dimension, sold or offered for sale, 12 fruits of the size nearest to 5 inches in maximum dimension, sold or offered for sale, 1 platter or chop dish of the size nearest to 15 inches in maximum dimension, sold or offered for sale, 1 open vegetable dish or bowl of the size nearest to 10 inches in maximum dimension, sold or offered for sale, 1 sugar of largest capacity, sold or offered for sale, 1 creamer of largest capacity, sold or offered for sale. If either soups or fruits are not sold or offered for sale, 12 cereals of the size nearest to 6 incnes in maximum dimension, sold or offered for sale, shall be substituted therefor.			

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1971)

SCHEDULE 5. - NONMETALLIC MINERALS AND PRODUCTS
Part 2. - Ceramic Products

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		(c) If each of the articles listed above in (b) of this headnote is not sold or offered for sale in the same pattern, but each of the following articles is sold or offered for sale in the same pattern, the classification hereunder in item 533.69 of all articles of such pattern shall be governed by the aggregate value of the following articles in the quantities indicated, as determined by the appraiser under section 402 of the Tariff Act of 1930, as amended, whether or not such articles are imported in the same shipment: 6 plates of the size nearest to 8 inches in maximum dimension, sold or offered for sale, 6 beverage cups and their saucers, 1 sugar of largest capacity, sold or offered for sale, 1 creamer of largest capacity, sold or offered for sale, 1 beverage pot of the size nearest a 6-cup capacity, sold or offered for sale. (d) The percentage of water absorption of cast and jiggered ceramic articles of the same pattern, which are "available in specified sets" and which are imported together in a ratio of at least 5 jiggered articles to 1 cast article in the same shipment shall be the average water absorption of such cast and jiggered articles, of the same pattern in the shipment, which average absorption shall be deemed to be equivalent to 5 percent of the water absorption of a representative sample of such cast articles plus 95 percent of the water absorption of a representative sample of such jiggered articles. 3. In those provisions of this part which classify merchandise according to the value of each "article", an article is a single tariff entity which may consist of more than one piece. For example, a vegetable dish and its cover, or a beverage pot and its lid, imported in the same shipment, constitute an article.			
		Articles chiefly used for preparing, serving, or storing food or beverages, or food or beverage ingredients:			
533.11	00	Of coarse-grained earthenware, or of coarse-grained stoneware	Doz.	3% ad val.	15% ad val.
		Of fine-grained earthenware, whether or not decorated, having a reddish-colored body and a lustrous glaze which, on teapots, may be any color, but which, on other articles, must be mottled, streaked, or solidly colored brown to black with metallic oxide or salt:			
533.14	00	Valued not over $1.50 per dozen articles	Doz.	7% ad val.	25% ad val.
533.16	00	Valued over $1.50 per dozen articles	Doz.	6% ad val.	25% ad val.
		Of fine-grained earthenware (except articles provided for in items 533.14 and 533.16) or of fine-grained stoneware:			
		Available in specified sets:			
533.23	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is not over $3.30	Doz.pcs.	6¢ per doz. pcs. + 16.5% ad val.	10¢ per doz. pcs. + 50% ad val.
533.25	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $3.30 but not over $7	Doz.pcs.	10¢ per doz. pcs. + 24% ad val.	10¢ per doz. pcs. + 50% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Articles chiefly used for preparing, serving, etc. (con.):			
		Of fine-grained earthenware, etc. (con.):			
		Available in specified sets (con.):			
533.26	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $7 but not over $12	Doz.pcs.	10¢ per doz. pcs. + 21% ad val.	10¢ per doz. pcs. + 50% ad val.
533.28	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $12	Doz.pcs.	6¢ per doz. pcs. + 12.5% ad val.	10¢ per doz. pcs. + 50% ad val.
		Not available in specified sets:			
533.31	00	Steins, mugs, candy boxes, decanters, punch bowls, pretzel dishes, tidbit dishes, tiered servers, and bonbon dishes	Doz.pcs.	6¢ per doz. pcs. + 15% ad val.	10¢ per doz. pcs. + 50% ad val.
		Other articles:			
533.33	00	Cups valued not over $0.50 per dozen, saucers valued not over $0.30 per dozen, plates not over 9 inches in maximum diameter and valued not over $0.50 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued not over $1 per dozen, and other articles valued not over $1 per dozen	Doz.pcs.	6¢ per doz. pcs. + 15% ad val.	10¢ per doz. pcs. + 50% ad val.
533.35	00	Cups valued over $0.50 but not over $1 per dozen, saucers valued over $0.30 but not over $0.55 per dozen, plates not over 9 inches in maximum diameter and valued over $0.50 but not over $0.90 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $1 but not over $1.55 per dozen, and other articles valued over $1 but not over $2 per dozen	Doz.pcs.	10¢ per doz. pcs. + 24.5% ad val.	10¢ per doz. pcs. + 50% ad val.
533.36	00	Cups valued over $1 but not over $1.70 per dozen, saucers valued over $0.55 but not over $0.95 per dozen, plates not over 9 inches in maximum diameter and valued over $0.90 but not over $1.55 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $1.55 but not over $2.65 per dozen, and other articles valued over $2 but not over $3.40 per dozen	Doz.pcs.	10¢ per doz. pcs. + 21% ad val.	10¢ per doz. pcs. + 50% ad val.
533.38	00	Cups valued over $1.70 per dozen, saucers valued over $0.95 per dozen, plates not over 9 inches in maximum diameter and valued over $1.55 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $2.65 per dozen, and other articles valued over $3.40 per dozen	Doz.pcs.	6¢ per doz. pcs. + 13% ad val.	10¢ per doz. pcs. + 50% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Articles chiefly used for preparing, serving, etc. (con.):			
533.41	00	Of bone chinaware	Doz.pcs.	21% ad val.	10¢ per doz. pcs. + 70% ad val.
		Of nonbone chinaware or of subporcelain:			
533.51	00	Hotel or restaurant ware and other ware not household ware	Doz.pcs.	10¢ per doz. pcs. + 45% ad val.	10¢ per doz. pcs. + 70% ad val.
		Household ware available in specified sets:			
533.63	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is not over $10	Doz.pcs.	10¢ per doz. pcs. + 48% ad val.	10¢ per doz. pcs. + 70% ad val.
533.65	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $10 but not over $24	Doz.pcs.	10¢ per doz. pcs. + 55% ad val.	10¢ per doz. pcs. + 70% ad val.
533.66	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $24 but not over $56	Doz.pcs.	10¢ per doz. pcs. + 36% ad val.	10¢ per doz. pcs. + 70% ad val.
533.68	00	In any pattern for which the aggregate value of the articles listed in headnote 2(b) of this subpart is over $56	Doz.pcs.	6¢ per doz. pcs. + 21.5% ad val.	10¢ per doz. pcs. + 70% ad val.
533.69	00	Not covered by item 533.63, 533.65, 533.66, or 533.68, and in any pattern for which the aggregate value of the articles listed in headnote 2(c) of this subpart is over $8	Doz.pcs.	6¢ per doz. pcs. + 21.5% ad val.	10¢ per doz. pcs. + 70% ad val.
		Household ware not covered by item 533.63, 533.65, 533.66, 533.68, or 533.69:			
533.71	00	Steins, mugs, candy boxes, decanters, punch bowls, pretzel dishes, tidbit dishes, tiered servers, and bonbon dishes	Doz.pcs.	27% ad val.	70% ad val.
		Other articles:			
533.73	00	Cups valued not over $1.35 per dozen, saucers valued not over $0.90 per dozen, plates not over 9 inches in maximum diameter and valued not over $1.30 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued not over $2.70 per dozen, and other articles valued not over $4.50 per dozen	Doz.pcs.	6¢ per doz. pcs. + 27% ad val.	10¢ per doz. pcs. + 70% ad val.
533.75	00	Cups valued over $1.35 but not over $4 per dozen, saucers valued over $0.90 but not over $1.90 per dozen, plates not over 9 inches in maximum diameter and valued over $1.30 but not over $3.40 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $2.70 but not over $6 per dozen, and other articles valued over $4.50 but not over $11.50 per dozen	Doz.pcs.	6¢ per doz. pcs. + 36% ad val.	10¢ per doz. pcs. + 70% ad val.
533.77	00	Cups valued over $4 per dozen, saucers valued over $1.90 per dozen, plates not over 9 inches in maximum diameter and valued over $3.40 per dozen, plates over 9 but not over 11 inches in maximum diameter and valued over $6 per dozen, and other articles valued over $11.50 per dozen	Doz.pcs.	6¢ per doz. pcs. + 21% ad val.	10¢ per doz. pcs. + 70% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
534.11	00	Statues, statuettes, and hand-made flowers, all the foregoing not specially provided for, of ceramic ware, valued over $2.50 each and produced by professional sculptors or directly from molds made from original models produced by professional sculptors	X.....	4.5% ad val.	20% ad val.
		Smokers' articles, household articles, and art and ornamental articles such as, but not limited to, statues, figurines, flowers, vases, lamp bases, bric-a-brac, and wall plaques, all the foregoing not specially provided for, of ceramic ware:			
534.21	00	Of ceramic tile	X.....	7% ad val.	50% ad val.
534.31	00	Of coarse-grained earthenware, or of coarse-grained stoneware	No.....	3% ad val.	15% ad val.
		Of fine-grained earthenware, whether or not decorated, having a reddish-colored body and a lustrous glaze, and mottled, streaked, or solidly colored brown to black with metallic oxide or salt:			
534.74	00	Valued not over $1.50 per dozen articles	Doz.....	7% ad val.	25% ad val.
534.76	00	Valued over $1.50 per dozen articles	Doz.....	3.5% ad val.	25% ad val.
		Of fine-grained earthenware or of fine-grained stoneware (except articles provided for in items 534.74 and 534.76):			
534.81	00	Valued not over $3 per dozen articles	Doz.pcs.	6.5¢ per doz. pcs. + 18.5% ad val.	10¢ per doz. pcs. + 50% ad val.
534.84	00	Valued over $3 but not over $10 per dozen articles	Doz.pcs.	6¢ per doz. pcs. + 18% ad val.	10¢ per doz. pcs. + 50% ad val.
534.87	00	Valued over $10 per dozen articles	Doz.pcs.	2¢ per doz. pcs. + 12% ad val.	10¢ per doz. pcs. + 50% ad val.
534.91	00	Of bone chinaware	Doz.pcs.	15% ad val.	70% ad val.
534.94	00	Of nonbone chinaware or of subporcelain	Doz.pcs.	27% ad val.	70% ad val.
534.97	00	Other	X.....	16% ad val.	40% ad val.
		Subpart D. - Industrial Ceramics			
		Subpart D headnote: 1. Nonceramic materials used merely for supporting, joining, or reinforcing purposes in chemical ware provided for in this subpart shall be disregarded in determining the component material of chief value in such articles.			
		Ceramic magnets, ceramic electrical insulators whether or not in part of metal, and other ceramic electrical ware, including ferroelectric and piezoelectric ceramic elements:			
535.11		Porcelain insulators, with metal parts cemented thereto and comprising not less than 30 percent of the weight thereof, used in high-voltage, low-frequency electrical systems	.....	15% ad val.	35% ad val.
	20	*Commonly known as suspension, pin-type or line post insulators*	No.		
	40	*Other*	No.		
535.12	00	Ferrites	No.....	9% ad val.	45% ad val.
535.14		Other	.....	18% ad val.	60% ad val.
		Porcelain insulators used in high-voltage, low-frequency electrical systems:			
	10	*Commonly known as suspension, pin-type or line post insulators*	No.		
	25	*Other*	No.		
	50	*Other insulators*	No.		
	80	*Other*	X		
535.15	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	X.....	Free	

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Laboratory and industrial chemical ware, of ceramic ware:			
535.21	00	Of porcelain or of subporcelain	X	36% ad val.	60% ad val.
535.24	00	Of stoneware	X	24% ad val.	60% ad val.
535.27	00	Other	X	12% ad val.	45% ad val.
535.31		Sanitary ware, including plumbing fixtures and bathroom accessories, all the foregoing, and parts thereof, of ceramic ware		17.5% ad val.	60% ad val.
	20	*Plumbing fixtures*	*No.*		
	40	*Other*	*X*		
535.41	00	Machinery parts, of porcelain or of subporcelain	X	8% ad val.	40% ad val.
		Subpart E. - Ceramic Articles Not Specially Provided For			
		Ceramic wares, and articles of such wares, not specially provided for:			
536.11	00	Of porcelain or of subporcelain	X	27% ad val.	60% ad val.
536.15	00	Other	X	20% ad val.	45% 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. 15467:

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. 15467:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after October 1 --				
		1966	1967	1968	1969	1970
535.31	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	0.38¢ per lb.	0.34¢ per lb.	0.3¢ 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
531.35	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	50¢ per 1,000	40¢ per 1,000	30¢ 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.
532.41	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.	6% ad val.	6% ad val.	6% ad val.	6% ad val.
533.23	10¢ per doz. pcs. + 28% 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.
533.28	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.
533.31	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.
533.33	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.
533.35	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.
533.36	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.
533.38	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.

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
533.41	35% ad val.	31% ad val.	28% ad val.	24% ad val.	21% ad val.	17.5% ad val.
533.68	10¢ per doz. pcs. + 36% ad val.	9¢ per doz. pcs. + 32% ad val.	8¢ per doz. pcs. + 28.5% ad val.	7¢ per doz. pcs. + 25% ad val.	6¢ per doz. pcs. + 21.5% ad val.	5¢ per doz. pcs. + 18% ad val.
533.69	10¢ per doz. pcs. + 36% ad val.	9¢ per doz. pcs. + 32% ad val.	8¢ per doz. pcs. + 28.5% ad val.	7¢ per doz. pcs. + 25% ad val.	6¢ per doz. pcs. + 21.5% ad val.	5¢ per doz. pcs. + 18% ad val.
533.71	45% ad val.	40% ad val.	36% ad val.	31% ad val.	27% ad val.	22.5% ad val.
533.73	10¢ per doz. pcs. + 45% ad val.	9¢ per doz. pcs. + 40% ad val.	8¢ per doz. pcs. + 36% ad val.	7¢ per doz. pcs. + 31% ad val.	6¢ per doz. pcs. + 27% ad val.	5¢ per doz. pcs. + 22.5% ad val.
533.75	10¢ per doz. pcs. + 60% ad val.	9¢ per doz. pcs. + 54% ad val.	8¢ per doz. pcs. + 48% ad val.	7¢ per doz. pcs. + 42% ad val.	6¢ per doz. pcs. + 36% ad val.	5¢ per doz. pcs. + 30% ad val.
533.77	10¢ per doz. pcs. + 35% ad val.	9¢ per doz. pcs. + 31% ad val.	8¢ per doz. pcs. + 28% ad val.	7¢ per doz. pcs. + 24% ad val.	6¢ per doz. pcs. + 21% ad val.	5¢ per doz. pcs. + 17.5% ad val.
534.11	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
534.21	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
534.31	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
534.74	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
534.76	6.25% ad val.	5.5% ad val.	5% ad val.	4% ad val.	3.5% ad val.	3% ad val.
534.81	10¢ per doz. pcs. + 25% ad val.	9.2¢ per doz. pcs. + 23% ad val.	8.4¢ per doz. pcs. + 21.5% ad val.	7.5¢ per doz. pcs. + 20% ad val.	6.5¢ per doz. pcs. + 18.5% ad val.	6¢ per doz. pcs. + 17% ad val.
534.84	10¢ per doz. pcs. + 30% ad val.	9¢ per doz. pcs. + 27% ad val.	8¢ per doz. pcs. + 24% ad val.	7¢ per doz. pcs. + 21% ad val.	6¢ per doz. pcs. + 18% ad val.	5¢ per doz. pcs. + 15% ad val.
534.87	4¢ per doz. pcs. + 20% ad val.	3¢ per doz. pcs. + 18% ad val.	3¢ per doz. pcs. + 16% ad val.	2¢ per doz. pcs. + 14% ad val.	2¢ per doz. pcs. + 12% ad val.	2¢ per doz. pcs. + 10% ad val.
534.91	25% ad val.	22% ad val.	20% ad val.	17% ad val.	15% ad val.	12.5% ad val.
534.94	45% ad val.	40% ad val.	36% ad val.	31% ad val.	27% ad val.	22.5% ad val.
534.97	27% ad val.	24% ad val.	21.5% ad val.	18.5% ad val.	16% ad val.	13.5% ad val.
535.12	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
535.14	30% ad val.	27% ad val.	24% ad val.	21% ad val.	18% ad val.	15% ad val.
535.21	60% ad val.	54% ad val.	48% ad val.	42% ad val.	36% ad val.	30% ad val.
535.24	40% ad val.	36% ad val.	32% ad val.	28% ad val.	24% ad val.	20% ad val.
535.27	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
535.31	28% ad val.	25% ad val.	22.5% ad val.	20% ad val.	17.5% ad val.	15% ad val.
535.41	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
536.11	45% ad val.	40% ad val.	36% ad val.	31% ad val.	27% ad val.	22.5% ad val.

Other Amendments and Modifications

PROVISION

531.37--Language "and subporcelain" added to article description. Secs. 2(a), 29, Oct. 7, 1965, 79 Stat. 933, 939, effective date Dec. 7, 1965.

Subpt C--Headnote 2(a) modified by deleting "(items 533.23, 533.25, 533.27, 533.63, 533.65, 533.67, and 533.69)" and inserting "(items 533.23, 533.25, 533.26, 533.28, 533.63, 533.65, 533.66, 533.68, and 533.69)" in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.

PROVISION

Subpt C--Headnote 2(b) modified by deleting "item 533.23, 533.25, 533.27, 533.63, 533.65, or 533.67" and inserting "item 533.23, 533.25, 533.26, 533.28, 533.63, 533.65, 533.66, or 533.68" 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	
533.26--Item 533.27 (column 1 rate--10¢ per doz. pcs. + 21% ad 533.27 val.; column 2 rate--10¢ per doz. pcs. + 50% ad val.) 533.28 deleted and items 533.26 and 533.28 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.	
533.36--Item 533.37 (column 1 rate--10¢ per doz. pcs. + 22% ad 533.37 val.; column 2 rate--10¢ per doz. pcs. + 50% ad val.) 533.38 deleted and items 533.36 and 533.38 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.	
533.66--Item 533.67 (column 1 rate--10¢ per doz. pcs. + 36% ad 533.67 val.; column 2 rate--10¢ per doz. pcs. + 70% ad val.) 533.68 deleted and items 533.66 and 533.68 added in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.	
	533.69--Article description modified by deleting "item 533.63, 533.65, or 533.67" and inserting "item 533.63, 533.65, 533.66, or 533.68" in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.
	533.71--Heading immediately preceding item 533.71 modified 533.73 by deleting "item 533.63, 533.65, 533.67, or 533.75 533.69" and inserting "item 533.63, 533.65, 533.77 533.66, 533.68, or 533.69" in lieu thereof. Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19002, effective date Jan. 1, 1968.
	535.15--Item 535.15 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.

Statistical Notes

PROVISION	Effective date
531.37--See Other Amendments and Modifications	
00--Subporcelain refractory articles transferred from 531.3900	*Dec. 7, 1965*
533.26--See Other Amendments and Modifications	
00--Estab.(transferred from 533.2700pt)	*Jan. 1, 1968*
533.27--See Other Amendments and Modifications	
00--Disc.(transferred to 533.2600 & 533.2800)	*Jan. 1, 1968*
533.28--See Other Amendments and Modifications	
00--Estab.(transferred from 533.2700pt)	*Jan. 1, 1968*
533.36--See Other Amendments and Modifications	
00--Estab.(transferred from 533.3700pt)	*Jan. 1, 1968*
533.37--See Other Amendments and Modifications	
00--Disc.(transferred to 533.3600 & 533.3800)	*Jan. 1, 1968*
533.38--See Other Amendments and Modifications	
00-Estab.(transferred from 533.3700pt)	*Jan. 1, 1968*
533.66--See Other Amendments and Modifications	
00--Estab.(transferred from 533.6700pt)	*Jan. 1, 1968*
533.67--See Other Amendments and Modifications	
00-Disc.(transferred to 533.6600 & 533.6800)	*Jan. 1, 1968*
533.68--See Other Amendments and Modifications	
00-Estab.(transferred from 533.6700pt)	*Jan. 1, 1968*
535.11--	
00--Disc.(transferred to 535.1120 & 40)	*Jan. 1, 1971*
20--Estab.(transferred from 535.1100pt)	*do*
40--Estab.	*do*
535.14--	
10--Estab.(transferred from 535.1430pt & 60pt)	*Jan. 1, 1971*
20--Disc.(transferred to 535.1430)	*Jan. 1, 1966*
25--Estab.(transferred from 535.1430pt & 60pt)	*Jan. 1, 1971*
30--Estab.(transferred from 535.1420 & 40)	*Jan. 1, 1966*
Disc.(transferred to 535.1410, 25 & 50)	*Jan. 1, 1971*
40--Disc.(transferred to 535.1430)	*Jan. 1, 1966*
50--Estab.(transferred from 535.1430pt & 60pt)	*Jan. 1, 19[illegible]*
60--Disc.(transferred to 535.1410, 25 & 50)	*do*
535.15--See Other Amendments and Modifications	
00--Estab.(transferred from 535.1100-535.1400pt)	*Dec. 20, 1965*

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, 1970.

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, 1970

(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 1970	All countries: Percent change from 1969	First supplier: Country	First supplier: Value	Second supplier: Country	Second supplier: Value	Third supplier: Country	Third supplier: Value
Refractory magnesia, including dead-burned magnesite and dead-burned dolomite (p. 3)								
531.01	7,357	+24.4	Greece	6,319	Japan	380	Turkey	365
531.04	1,675	+194.8	Yugoslavia	1,167	Austria	284	Canada	183
Refractory mortars, ramming mixer, and castables (p. 15)								
531.11	437	-20.5	Austria	114	U. Kingdom	91	W. Germany	63
Refractory brick (p. 23)								
531.21	2	+10.1	France	2	Canada	1/	-	-
531.24	4,212	+6.3	Canada	3,920	Japan	206	W. Germany	46
531.27	1,158	-48.2	Canada	396	W. Germany	268	U. Kingdom	207
Pins, spurs, stilts, and thimbles used in the manufacture of ceramic articles (p. 39)								
531.31	1	-1.0	Italy	1	Mexico	1/	-	-
Refractory crucibles and refractory articles, not elsewhere enumerated (p. 43)								
531.35	13	-69.3	Italy	8	U. Kingdom	2	Sweden	1
531.37	120	+7.0	U. Kingdom	62	W. Germany	32	Japan	26
531.39	1,166	-22.9	Sweden	308	France	291	U. Kingdom	195
Ceramic structural building brick (p. 49)								
532.11	2,713	+60.0	Mexico	1,459	Canada	1,254	Dom. Rep.	1/
532.14	3	-14.9	Canada	3	-	-	-	-
Ceramic floor and wall tiles (p. 57)								
532.21	10,445	-32.6	Japan	10,276	Italy	71	Portugal	60
532.24	16,417	-21.0	Japan	7,777	U. Kingdom	3,428	Italy	1,644
Ceramic floor and wall tiles, unglazed, except mosaic tile (p. 71)								
532.27	1,146	-3.6	Italy	306	W. Germany	248	Mexico	229
Ceramic tiles not elsewhere enumerated, including roofing tile (p. 75)								
532.31	107	-10.9	Japan	33	Spain	17	U. Kingdom	12
Friezes, mantels, and other construction articles of ceramic tiles (p. 79)								
532.41	10	+23.9	Italy	8	Japan	1	Spain	1
Ceramic construction articles, not elsewhere enumerated (p. 83)								
532.61	421	+119.3	W. Germany	216	Canada	190	France	8
Articles of coarse-grained earthenware or stoneware, so-called "Rockingham" earthenware and ceramic art and ornamental articles (p. 89)								
533.11	63	-47.6	Japan	48	Mexico	7	Italy	6
533.14	841	+38.7	Japan	840	Poland	1/	-	-
533.16	404	+2.6	Japan	302	U. Kingdom	53	Italy	22
533.11	4,226	+41.9	W. Germany	1,444	U. Kingdom	1,229	Italy	475
534.21	175	-27.4	Japan	91	U. Kingdom	18	W. Germany	18
534.31	290	+21.9	Mexico	260	Japan	12	Spain	2
534.74	89	-10.3	Japan	89	-	-	-	-
534.76	733	+15.9	Japan	660	Canada	39	Italy	26
534.81	5,489	+9.6	Japan	5,251	Italy	113	Portugal	23
534.84	6,311	+23.9	Japan	5,422	Italy	459	W. Germany	96
534.87	9,930	+14.1	Italy	4,215	U. Kingdom	1,516	Japan	1,468

See footnotes at end of table.

OTHER AVAILABLE VOLUMES OF THE SUMMARIES SERIES

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	10	Beverages
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
1	14	Edible Preparations, Natural Resins, and Miscellaneous Articles of Vegetable Origin
2	1	Wood and Related Products I
2	2	Wood and Related Products II
2	3	Paper and Related Products I
2	4	Paper and Related Products II
2	5	Books and Other Printed Matter
3	1	Fibers, Yarns, Waste, and Intermediate Products of Cotton, Other Vegetable Fibers, and Wool
3	2	Fibers, Yarns, Waste, and Intermediate Products of Silk, Manmade Fiber, Metalized, Paper Certain Hair, and Yarns, N.S.P.F.
3	3	Fabrics, Woven, Knit, Pile, Tufted and Narrow
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	5	Organic Chemicals I