UNITED STATES TARIFF COMMISSION

SUMMARIES OF TRADE AND TARIFF INFORMATION

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

Schedule 4
Chemicals and Related Products
(In 12 volumes)

Volume 9

Glue, Gelatin, Aromatic Substances,
Toilet Preparations, Surface-Active Agents,
Soaps, Dyes, and Tannins

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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 4

Volume 9

C O N T E N T S

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4:9

Numerical List of TSUS Items in This Volume

This volume (indentified as volume 4:9) is the sixth in a series of 12 volumes of summaries on the chemicals and related products classified under schedule 4 of the TSUS. Schedule 4 is divided into 13 parts of which parts 6, 7, and 8 and subpart 9A are covered by this volume. This section of the TSUS deals principally with chemicals and chemical products which are derived from naturally occurring materials of animal or vegetable origin, but also includes certain related synthetic chemicals and products, as well as some mixtures. Volume 4:9 covers agar, pectin, isinglass, glue stock, gelatin, glue, and glue size (part 6--items 455.02 to 455.46); natural and synthetic aromatic and odoriferous substances, including certain mixtures, but excluding heliotropin (subpart 7A--items 460.05 to 460.35 and 460.45 to 460.90); perfumes, cosmetics, and other toilet preparations (subpart 7B--items 461.05 to 461.45); non-benzenoid surface-active agents, except sodium and potassium salts of fatty substances (subpart 8A--items 465.05 to 465.20 and 465.35 to 465.95); soap products and formulated non-benzenoid synthetic detergent products (subpart 8B--items 466.05 to 466.30); and natural materials suitable for dyeing and tanning (subpart 9A--items 470.05 to 470.85). Heliotropin (item 460.40) is discussed in volume 4:1 with benzenoid aromatic or odoriferous compounds; sodium and potassium salts of fatty substances (items 465.25 and 465.30) in subpart 8A of the TSUS are discussed in volume 4:12 with other salts of fatty substances (items 490.30 to 490.50). On the other hand, miscellaneous textile assistants classified in subpart 13B (item 493.50) are included with the surface-active agents (subpart 8A) of this volume. The complete list of products covered by summaries in this volume is shown in appendix A.

Aggregate U.S. consumption of all of the chemicals and chemical products covered by this volume is supplied principally by domestic production. However, there is no U.S. production of isinglass, fish glue, and many perfume, dyeing, and tanning materials. Both consumption and production of these articles in 1967 are estimated to have been in excess of $3 billion. Cosmetics and other toilet preparations accounted for the major share of these totals (about 60 percent); non-benzenoid surface-active agents, soap, and non-benzenoid detergent formulations, together, accounted for 25-30 percent; perfumes and perfume materials accounted for 6 percent; and, glues, gelatin, and related products for another 6 percent. Dyeing and tanning materials accounted for less than 1 percent of both the consumption and production totals.

Export statistics for some of the products covered by this volume are not available; however, based on partial estimates, U.S. exports of the products covered here are believed to have been in excess of $75 million in 1967, somewhat greater than imports for that year. Cosmetics, non-benzenoid surface-active agents, including soap and detergent formulations, and perfume materials are believed to have accounted for the bulk of exports in 1967. Because of the nature of these products, the exports had wide distribution which included Canada, Japan and several countries of Western Europe and Latin America as important markets.

In 1967, U.S. imports of the chemicals covered by this volume amounted to $69.4 million. This amount was distributed by major product divisions (and TSUS parts) as follows:

TSUS part or subpart	Product division	Value of imports in 1967 (million dollars)
6	Glue and gelatin (including glue stock)	22.7
7A	Aromatic or odoriferous substances	14.7
7B	Perfumery, cosmetics, and toilet preparations	12.3
8A	Surface-active agents	5.2
8B	Soap and synthetic detergents	1.8
9A	Dyeing and tanning products	12.7
	Total	69.4

The distribution in 1967 of U.S. imports of chemicals covered in this volume, by principal sources, was as follows:

Source	Value (million dollars)	Principal products
France	19.4	Perfumes and perfume materials; cosmetics; gelatin; glue stock; tanning materials.
Argentina	6.7	Tanning materials; glue stock.
Switzerland	6.0	Perfume materials; surface-active agents.
United Kingdom	5.8	Gelatin and glue; perfume materials; soap; surface-active agents.
Belgium	4.8	Glue stock; gelatin.
West Germany	4.1	Glue; perfumes and cosmetics; surface-active agents.
Canada	3.7	Surface-active agents; tanning materials; glue.
All other	18.9	Tanning and dyeing materials; glue stock; glue; soap; perfumery.
Total	69.4	

Appendix B to this volume gives the value in 1967 of total imports and imports from the three principal supplying countries for each TSUS item included in this volume.

The following group of 10 summaries covers all of the products provided for in part 6 of schedule 4 (items 455.02 to 455.46) of the Tariff Schedules of the United States (TSUS). Part 6 is comprised primarily of tariff provisions for products (agar, pectin, isinglass, glue, and gelatin) that are related in the sense that their water solutions set to rigid gels. Part 6 also includes provisions for raw materials of animal origin (bones, hide cuttings, ossein, and other glue stock) used in the manufacture of some of these products, and for certain of their derivatives (e.g., glue size).

Agar is derived from seaweed and pectin from the cell walls of apples, citrus fruits, and other plants. Gelatin, including the product known as isinglass, is the protein substance obtained by hydrolyzing collagen, the principal constituent of the white connective tissues of animals. The term "glue" was originally used only to designate a somewhat impure gelatin used as an adhesive; however, its meaning has now been extended to include other adhesives of animal and vegetable origin. Casein glue and fish glue, although of animal origin, are specifically provided for as such (items 455.34 through 455.38) and are therefore not embraced in the provisions for animal glue (items 455.40 and 455.42). For purposes of clarity, the term "animal glue", as used hereafter in these summaries, is, unless otherwise indicated, limited to the types of glue so classified for tariff purposes. Vegetable glues include products derived from starch, soybean flour, and plant gums.

Some glues, important in domestic production but not in U.S. import trade, are made from an admixture of varying proportions of ingredients of both animal and vegetable origin and sometimes of synthetic origin. These glues are most often soybean-based protein glues containing as ingredients dried soluble animal blood (item 190.20), casein (item 493.15), or synthetic resins (items 405.25 and 445.05-.75). Glues, particularly those packaged for retail sale, may also contain preservatives, pesticides, or other additives.

Summaries on the raw materials for animal glue and gelatin--bones, hide cuttings, ossein, etc.--are included in this group of summaries. Raw materials for casein and vegetable-derived adhesives of this group are not included, but are discussed in summaries covering the following TSUS items:

Article	Item No.
Starches	132.35-.55
Vegetable oil-cake meal	184.52
Gums	188.36-.38
Blood and blood albumen	190.10; 190.20
Crude seaweed	192.05
Casein	493.15

The domestic output of the products covered by this group of summaries, as measured by domestic shipments, was valued at $141 million in 1963, the latest year for which statistics are available (table 1). THe relative importance of each product in the domestic economy is shown in table 1. Gelatin, starch-derived adhesives, and animal glue are the three most important. Fish glue and isinglass are not produced domestically.

The total value of U.S. imports of the products with which this group of summaries is concerned ranged between $7 million in 1962 and $13 million in 1967. Gelatin, animal glue, and agar accounted for about 95 percent of both quantity and value of imports. The United Kingdom, France, West Germany, Belgium, and Morocco were the principal suppliers of these materials (table 2).

Table 1.--Glue, gelatin and related products: U.S. shipments of domestic production, by product, 1963

Product	1963 value of shipments
	1,000 dollars
Gelatin	41,098
Animal glue	21,525
Vegetable glues:	
Starch and dextrine	26,539
Gums and mucilage	2,072
Soybean protein	1,964
Casein glue	7,225
Blood and miscellaneous protein glue	15,206
Glue size	10,364
Pectin	14,364
Agar	1/ 1,000
Fish glue	-
Isinglass	-
Total	141,357

1/ Estimated.

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

Table 2.--Glue, gelatin and related products: U.S. imports for consumption, by product, 1962-67

Product	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Gelatin	7,436	8,314	7,660	8,007	10,141	10,747
Animal glue	12,506	18,761	19,980	23,356	23,955	24,658
Vegetable glue	48	109	112	45	26	295
Casein glue	9	15	27	7	106	70
Glue size	1/	1/	-	30	71	97
Pectin	306	397	428	303	325	391
Agar	627	692	633	944	679	818
Fish glue	888	748	711	918	1,029	1,083
Isinglass	32	25	28	28	44	36
Total	21,852	29,061	29,579	33,638	36,376	38,195
	Value (1,000 dollars)					
Gelatin	3,792	4,098	3,792	4,102	5,912	6,523
Animal glue	2,037	2,691	2,983	3,384	3,587	4,004
Vegetable glue	8	17	18	8	5	38
Casein glue	1	4	4	2	19	13
Glue size	1/	1/	-	4	15	22
Pectin	294	386	423	279	313	399
Agar	965	1,008	993	1,635	1,371	2,207
Fish glue	150	125	132	182	228	252
Isinglass	24	19	22	24	42	36
Total	7,271	8,348	8,367	9,620	11,492	13,494

1/ Statistics not available; probably nil.

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

Commodity	TSUS item
Agar	455.02

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

Imports of agar supply more than three-fourths of U.S. consumption. In 1967, U.S. imports of agar amounted to 818,000 pounds, valued at $2.2 million. Very little, if any, agar is exported from the United States.

Description and uses

Agar (the original Malayan term, agar-agar, is now obsolete) is a seaweed colloid extracted from various plants of the botanical class, Rhodophyceae (the red algae), principally from various species of Gelidium. It is also known by a variety of other names, such as Chinese or Japanese gelatin or isinglass, Chinese moss, and (in Japan) kanten. So-called Danish agar and British agar are not true agar; the terms are misnomers for two other types of colloids. Agar appears in commerce as thin, brittle, translucent strips or flakes, and as a pale, coarse, buff-colored powder. Chemically, it is a salt of the sulfuric acid ester of a polysaccharide (see summary on saccharides and related chemicals, not elsewhere enumerated, items 493.65-493.68) formed by the glycosidic linking of galactopyranose units.

The commercial importance of agar is based on its gel-forming properties. In cold water, agar swells considerably, but does not dissolve. In boiling water, however, it dissolves readily, forming solutions that, even in low concentrations, set to a firm gel. Agar is used in medicine as a mechanical laxative and in making pills, capsules, and other pharmaceutical preparations; as a bacteriological culture medium; as a component of dental impression materials (item 495.15); in bakery and confectionery products; and in the manufacture of sausage casings and other food products where thickening or gelling agents are required.

Some agar is graded on the basis of factors such as appearance, gel-strength, and purity as determined by the content of crude protein or hot-water residues. For most purposes, agar must conform to customer specifications. For pharmaceutical use, the specifications are established by the United States Pharmacopoeia (U.S.P. VII).

Commercial methods for the preparation and purification of agar are based on its solubility in hot water but relative insolubility in cold. The agarophyte, or agar-bearing material, is first cleaned mechanically by washing. Next, the crude agar is extracted by boiling water or steam. The resulting liquor is filtered, and the filtrate cooled to form a gel which is then frozen. Upon thawing, the water in excess of that absorbed by the agar drains off, carrying with it most of the impurities; further washing with cold water removes the rest. The wet gel may be bleached before drying.

Agar competes in most of its uses with other seaweed colloids, such as carrageenin (item 192.07) and the alginates (items 425.09 and 426.88), as well as with other gelatinous substances such as gelatin (items 455.16-.20) and carboxymethyl cellulose (item 465.87).

U.S. tariff treatment

The column 1 rate of duty applicable to imports (see general headnote 3 in the TSUSA-1968) is as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
455.02	Agar----------	15% ad val.	7.5% ad val.

The rate effective January 1, 1972, represents the final stage of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rate shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. production and consumption

The sole producer of agar in the United States is situated in California. His annual production of agar in recent years is believed to have amounted to several hundred thousand pounds, valued at about $1 million, and to have been roughly twice his annual production in 1961. On the whole, the domestic agar is of a much higher grade than that imported; virtually all of the agar used as a bacteriological culture medium in the United States is supplied by the domestic producer. Some of the raw material is imported duty-free from Mexico (item 192.05), but most is obtained from domestic seaweed beds.

The apparent U.S. consumption of agar, which was probably less than 800,000 pounds in 1961, exceeded 1 million pounds in 1967. About three-fourths of annual consumption is usually supplied by imports.

U.S. imports and exports

Imports of agar into the United States increased irregularly from 505,000 pounds, valued at $871,000, in 1961, to 818,000 pounds, valued at $2.2 million, in 1967 (see accompanying table). Morocco has been the principal source of these imports. Spain and Japan have been important sources, and Portugal and the Republic of Korea, significant ones. (However, no agar was imported from the latter in 1967.)

Very little, if any, agar is exported from the United States; official export statistics are not available.

Foreign production and trade

Beds of red seaweed that can serve as the raw material for the production of agar in foreign countries abound in coastal regions of the temperate zones throughout the world; however, only the area comprising the coasts of Japan and Korea in the Pacific, and the area comprising the coasts of Morocco, Spain, and Portugal in the Atlantic, (in addition to the beds off the coasts of Southern California and Mexico) produce the best agar. Agar produced in Australia, New Zealand, the Republic of South Africa, South America, and Sakhalin Island are sufficiently different from the major agars of commerce that they cannot be readily substituted for them; these agars are produced mainly for local consumption.

The annual world production of agar, other than that produced in the United States, is probably between 5 and 10 million pounds, about 95 percent of which is made in Japan. Morocco, the U.S.S.R. and Mainland China probably produce several hundred thousand pounds per year.

Agar: U.S. imports for consumption, by principal sources, 1961-67

Source	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
Morocco	245	207	366	156	427	381	584
Japan	76	141	59	149	257	134	91
Spain	72	151	161	192	160	54	108
Portugal	45	51	40	65	40	42	20
Korean Republic	57	73	40	50	48	25	-
All other	10	4	26	21	12	1/ 43	15
Total	505	627	692	633	944	679	818
	Value (1,000 dollars)						
Morocco	408	311	522	227	739	763	1,548
Japan	158	245	106	249	449	280	267
Spain	122	222	231	292	272	119	293
Portugal	77	81	62	108	75	81	54
Korean Republic	87	97	53	71	73	43	-
All other	19	9	34	46	27	1/ 85	45
Total	871	965	1,008	993	1,635	1,371	2,207

1/ Includes 40 thousand pounds, valued at 73 thousand dollars, from France.

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

Commodity	TSUS item
Pectin	455.04

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

The United States probably is the world's leading producer of pectin. In 1967, U.S. production probably exceeded 15 million pounds; exports amounted to 1.3 million pounds, and imports were 325,000 pounds.

Description and uses

Pectin is a carbohydrate product obtained by processing pectic substances; the latter are a group of complex compounds related to the polysaccharides (see summary on Polysaccharides and Related Chemicals, items 493.65 to 493.68) and found in plant cell walls. Chemically, pectin consists of polygalacturonic acid that has been partially esterified with methanol.

Purified pectin is a light-colored, water-soluble, almost odorless powder, but is marketed as a liquid concentrate as well as in powder form. Pectin is used primarily as a gelling agent for the manufacture of jams and jellies in both commercial and home-canning processes; it is also used in pharmaceutical preparations and for other purposes. For use in jam and jelly making, the quality of a commercial pectin is designated by a numerical "jelly grade" that indicates the parts by weight of sugar with which one part of pectin can be combined to form a satisfactory gel. Pectin's principal pharmaceutical use is in antidiarrhetics.

Citrus peel from the manufacture of citrus juices and concentrates, and the dried residue (pomace) obtained in the manufacture of cider and apple juice, are the chief sources of the pectic substances from which pectin is manufactured. Citrus pectin is generally sold as a powder, and apple pectin, as a liquid concentrate. Dried sugar-beet slices and sunflower heads have been used as raw materials to a limited extent. In the United States, most pectin is made from citrus peel.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
455.04	Pectin----------	10.5% ad val.	5% ad val.

The rate effective January 1, 1972, represents the final stage of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reduction became effective January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rate shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption, production, and exports

Statistics on the production of pectin in the United States are not available; however, production may be assumed to be equal to shipments (including interplant transfers) by manufacturers. Shipments increased from 10.5 million pounds, valued at $9.1 million, in 1958 to 15.5 million pounds, valued at $14.4 million, in 1963. More recent data are not available. Imports are much smaller than shipments and accordingly it appears that domestic producers supply nearly all of the pectin consumed in the United States, and that domestic production has been between 5 and 10 percent greater in quantity than domestic consumption.

There are four domestic producers making pectin in six plants--five in California, and one in the Midwest. One producer's output is used primarily to satisfy his own demand for pectin as an ingredient in more advanced products. The other three manufacture pectin for sale exclusively. All of the firms, however, also manufacture products other than pectin.

Average annual exports of pectin amounted to about 700,000 pounds in 1961-64, when they varied little. They increased to 982,000 pounds in 1965 and to 1,313,000 pounds in 1967. Half, or nearly half, of the pectin exported during 1961-67 was sent to Canada and Japan. West Germany, the Netherlands, Australia, Mexico, Sweden, and Norway were other noteworthy markets for exports (table 1). In each of the years under consideration, exports of pectin probably were equivalent to 5 to 10 percent of U.S. production of pectin.

U.S. imports

Imports of pectin increased regularly from 286,000 pounds, valued at $263,000, in 1961 to 428,000 pounds, valued at $423,000, in 1964, dropped to 303,000 pounds, valued at $279,000, in 1965, and increased to 391,000 pounds, valued at $399,000, in 1967 (table 2). In each of the years 1961-67, imports were considerably smaller than exports and probably accounted for less than 10 percent of domestic consumption. During this period, Denmark alone supplied two-thirds or more of the annual imports. Although Italy was the second supplier during 1961-65, it was not a source of imports in 1966-67.

Foreign production and trade

In 1966, European production probably was of about the same order of magnitude as U.S. production--that is, about 10 million pounds. In 1967, the production of pectin probably increased in both Europe and the United States. The manufacture of pectin from the dried residue of crushed apples has been well established in the United Kingdom and in West Germany for nearly 50 years. Other Western European countries that are apple or citrus-fruit producers are believed to have started its manufacture in recent years.

Sweden and the U.S.S.R. are reported to have produced pectin from sugar-beet residue, and West Germany, Bulgaria, and Rumania from sunflower heads.

Table 1.--Pectin: 1/ U.S. exports of domestic merchandise, by principal markets, 1961-67

Market	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
Canada	222	281	282	246	320	316	409
Japan	104	54	99	95	177	239	289
West Germany	9	10	17	6	12	119	121
Netherlands	47	46	50	78	74	78	80
Australia	19	60	38	42	59	69	71
Sweden	52	26	40	25	35	27	68
Mexico	21	19	25	36	44	39	43
Italy	2/	2	8	10	4	64	24
Norway	16	11	14	24	24	24	20
Denmark	1	2/	2/	-	90	66	20
All other	3/ 197	4/ 174	153	132	143	222	168
Total	688	683	726	694	982	1,263	1,313
	Value (1,000 dollars)						
Canada	311	394	365	328	498	415	549
Japan	127	70	133	123	221	289	341
West Germany	12	14	22	8	16	146	177
Netherlands	70	71	80	125	117	136	136
Australia	27	88	55	57	82	94	99
Sweden	84	38	59	37	54	40	105
Mexico	31	35	42	55	72	61	66
Italy	1	3	12	16	7	126	52
Norway	36	26	26	41	41	52	51
Denmark	1	1	5/	-	129	102	29
All other	3/ 265	4/ 241	232	207	229	331	249
Total	965	981	1,026	997	1,466	1,792	1,854

1/ Classified as pectin and preparations, 1961-64, and as pectin and pectic substances, 1965-67.

2/ Less than 500 pounds.

3/ Includes 65 thousand pounds, valued at 84 thousand dollars, to the United Kingdom; 32 thousand pounds, valued at 41 thousand dollars, to Venezuela; and 24 thousand pounds, valued at 28 thousand dollars, to the Republic of South Africa.

4/ Includes 59 thousand pounds, valued at 76 thousand dollars, to the United Kingdom.

5/ Less than $500.

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

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Table 2.--Pectin: U.S. imports for consumption, by principal sources, 1961-67

Source	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
Denmark	272	267	301	291	258	309	293
Italy	6	39	94	118	27	-	-
West Germany	6	-	-	7	14	6	21
Switzerland	-	-	1	11	2	2	-
United Kingdom	-	-	-	1	2	6	3
All other	2	-	1	-	-	2	1/ 74
Total	286	306	397	428	303	325	391
	Value (1,000 dollars)						
Denmark	251	259	293	284	241	299	299
Italy	5	35	92	116	22	-	-
West Germany	5	-	-	7	13	6	21
Switzerland	-	-	1	16	2	1	-
United Kingdom	-	-	-	2/	1	6	3
All other	2	-	-	-	-	1	1/ 76
Total	263	294	386	423	279	313	399

1/ Includes 73 thousand pounds; valued at 75 thousand dollars, from the Netherlands.

2/ Less than $500.

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

Commodity	TSUS item
Isinglass	455.06

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

Isinglass, a pure form of gelatin, is no longer produced in the United States. Imports during 1961-67 did not exceed 45,000 pounds or a value of $45,000 in any year.

Description and uses

Isinglass, as the term is used in the tariff schedules, is a semitransparent, almost white, odorless, tasteless, and very pure form of gelatin obtained from the swimming bladders (or sounds) of sturgeon and other fish. In fact, it is sometimes referred to as fish gelatin, the term, isinglass, being reserved for the unprocessed sounds (item 190.50). Isinglass is produced by opening, washing, stretching, and drying the fish sounds, which, after being softened in cold water, are rolled into sheets. This is the form in which it is generally marketed; some, however, is flaked or shredded before entering commerce. Among a variety of former uses for isinglass, the detanning and clarifying of wine and other beverages is one of the few that have survived. Because of its relatively high cost, isinglass has been replaced in many uses by other materials.

The term, isinglass, is also a synonym for mica (items 516.11-516.98), especially mica in thin, transparent sheets. Japanese isinglass and Chinese isinglass are misnomers; the products to which they refer are more properly called agar (item 455.02). Fish glue (items 455.36 and 455.38), a similar but much less pure product, is distinguished from fish gelatin (isinglass) primarily on the basis of the fish parts from which it is derived.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
455.06	Isinglass----------	17% ad val.	8.5% ad val.

The rate effective January 1, 1972, represents the final stage of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rate shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

Consumption, production, and imports

Isinglass is no longer produced in the United States and the limited U.S. consumption of that product is supplied by imports. During the period 1961-67, U.S. imports of isinglass increased from a low of 15,000 pounds, valued at $11,000, in 1961, to a high of 44,000 pounds, valued at $42,000, in 1966, but declined somewhat, to 36,000 pounds, valued at $36,000, in 1967. Little significance is attached to the general upward trend during 1961-67. Import statistics for 1961-67, compiled from official statistics of the U.S. Department of Commerce, are tabulated below:

Year	Quantity (Pounds)	Value
1961----------	14,640	$10,950
1962----------	32,100	23,841
1963----------	24,840	18,668
1964----------	28,105	21,547
1965----------	28,404	23,607
1966----------	44,438	42,483
1967----------	36,015	35,870

All imports during 1961-65, and almost all imports in 1966 and 1967, were from the United Kingdom. The foreign value of the imports from the United Kingdom during the 4-year period, 1961-64, was about 75 cents per pound, but since 1964 rose steadily to $1.09 per pound in 1967.

Small imports of isinglass from Japan and Taiwan were reported in 1966 and 1967. An examination of the unit value of the imports from Japan indicates that they were probably agar (455.02) and incorrectly reported for statistical purposes. The unit value of imports from Taiwan, about 15 cents per pound, is a further indication of incorrectly reported statistics.

Foreign production and trade

Any foreign country with a sizable fishing industry and access to suitable species of fish could produce isinglass with a minimum of processing equipment. Because of its relatively high cost and limited demand, however, it is unlikely that any countries which are not currently producers would begin its manufacture.

Information is not available as to what countries other than the United Kingdom (the U.S. supplier) are producers of isinglass.

Commodity	TSUS item
Bones, crude, steamed or ground	455.08
Raw hide cuttings	455.10
Ossein	455.12
Glue stock, not specially provided for	455.14

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

Between a half and 1 billion pounds of the products covered by this summary are consumed annually in the United States in the manufacture of glue and gelatin (principally glue) of which between 10 and 20 percent is supplied by imports. In 1967, imports amounted to 140 million pounds, valued at $9 million. Exports are probably negligible.

Description and uses

Glue stock is the raw material from which glue 1/ is produced (see summaries on animal glue and on fish glue, items 455.36 to 455.42). Covered by the term are such collagen-containing materials as the hides or skins of cattle, sheep, pigs, rabbits, and other animals; the bones (including ossein) of these animals; and other inedible parts such as tails, ears, sinews, and cartilage. In general, these materials are obtained as byproducts of tanneries or the meat-packing industry. Carefully selected material of the same kind serves as the raw material for the manufacture of better grades of gelatin (items 455.16 to 455.24).

The whole hide or skin of an animal is usually too valuable to be used as glue stock, but instead is generally processed into leather. Consequently, hide stock for glue-making consists largely of hide scraps, trimmings, splits, fleshings, and similar waste products of tanneries.

1/ The term, glue, is used here in its strict, or original, sense to describe the protein substance obtained by the hydrolysis of collagen (the principal constituent of the white connective tissue of animals). The term is frequently used in a loose sense to describe any adhesive.

In industrial terminology bone stock is generally categorized as either green bone or dry bone. Green bone is the fresh bone as supplied directly to the glue plant by butchers and meat-processors; it is further categorized as killing bones or cutting bones. The former are the bones removed when the carcass is dressed (e.g., skulls, jaws, and feet); the latter are those which are trimmed out later, after the carcass has been chilled. The refrigeration and more prompt handling which cutting bones receive results in their producing a better quality of glue; however, shin bones that have been rendered to recover neatsfoot oil also produce a good grade of glue.

Although it is feasible in arid climates to dry bones in the open air without preliminary treatment, it is usually necessary to degrease the bones to prevent deterioration. Steamed, or packer, bone is bone which has been dried after a short preliminary cooking in boiling water, which renders the fat and floats it to the surface of the liquid. Extracted bone has been degreased by solvent extraction before drying.

About 40 percent of the dry weight of animal bones consists of inorganic salts, chiefly calcium phosphate and other calcium compounds. The inorganic salts can be removed by treatment with dilute hydrochloric acid. The residue is nearly pure collagen, and is termed ossein. Ossein can be converted to a high-quality glue by much the same processes as other collagen; in practice, however, this relatively expensive material is usually converted to higher grade gelatin. Dicalcium phosphate (item 418.28), an important dietary supplement, is a coproduct of ossein in the demineralization of bones.

Ground bones, provided for in item 455.08, are seldom, if ever, used as a glue raw material. Rather, they are used as a fertilizer material (item 480.40), or as an ingredient of animal feed (item 184.75).

Glue stock includes the heads, bones, and other skeletal waste of fish as well as material of other animal origin. In practice, however, glue stock derived from fish is not an article of international commerce because of the rapid deterioration of such material.

U.S. tariff treatment

Imports of crude, steamed, or ground bones; raw hide cuttings; ossein; and glue stock, not specially provided for, are entered free of duty under items 455.08, 455.10, 455.12, and 455.14, respectively, of the TSUS. Their duty-free treatment was originally provided for in paragraphs 1627 and 1689 of the Tariff Act of 1930, and has been bound as a result of concessions granted by the United States under the General Agreement on Tariffs and Trade (GATT). The duty-free treatment of crude, steamed, or ground bones is also bound in the bilateral agreement with Argentina which has been in effect since November 15, 1941.

U.S. consumption, production, and trade

The raw materials covered by this summary are used not only in the production of glue, but also for the manufacture of the closely related product, gelatin (items 455.16 to 455.24, 455.40, and 455.42); moreover, bones are also used to make bone black, bone meal, and bone char (items 473.02, 480.40, and 493.25, respectively). About one-half billion pounds, probably valued between $25 and $50 million, of the hides and skins, bones, and other raw materials discussed herein are consumed annually in the manufacture of glue. In addition, several hundred million pounds of the same (but more carefully selected) materials are used to make gelatin, and an equal quantity of bones are used to make products other than glue or gelatin.

Since exports of glue stock (which are not reported separately in official statistics) are probably negligible, domestic production is approximately equivalent to consumption less imports. In 1962-67, imports ranged in quantity from 103 million pounds in 1964 to 177 million pounds in 1962, and in value from $3.6 million in 1964 to $9.2 million in 1967 (table 1). Belgium, Argentina, Brazil, and India were the principal sources of imports. (In volume of imports, Canada was also a major source.) In terms of both quantity and value, bones are the principal type of glue stock imported (table 2). In 1962-67, crude bones in most years accounted for about three-fourths of the quantity, and nearly half of the value of U.S. imports of all kinds of glue stock. Hide cuttings are second in terms of quantity, but ossein is second in terms of value.

U.S. imports of bone stock during the period, 1962-67, ranged in quantity from 74 million pounds in 1964 to 147 million pounds in 1962, and in value from $1.8 million in 1964 to $4.6 million in 1966 (table 3). Argentina was the principal source of imports during this period; Brazil, India, and Canada were also important sources.

Imports of raw hide cuttings declined from 19 million pounds, valued at $711,000, in 1962 to 13 million pounds, valued at $426,000, in 1965, but increased to 18 million pounds, valued at $839,000, in 1967 (table 4). Canada was the principal source of these imports in most years; Colombia, Argentina, and Venezuela were other major sources.

Belgium has been the only major source of U.S. imports of ossein in recent years (table 5). Imports of ossein increased irregularly from 6 million pounds, valued at $1.5 million, in 1962 to 11 million pounds, valued at $3.4 million, in 1967.

Imports of glue stock other than bones, raw hide cuttings, and ossein increased fairly steadily from 4 million pounds, valued at $103,000, in 1962, to 13 million pounds, valued at $789,000, in 1967 (table 6). Brazil was the principal source of imports in the last three

years; Canada and Italy were the principal sources in other years. Other South American countries have also been major sources of U.S. imports of glue stock, not specially provided for.

Foreign production and trade

Cattle-raising countries, and countries which raise other domesticated animals for their meat or skins, as well as those countries which import hides and skins and process them into leather, obtain glue-yielding materials as byproducts of their meat-processing or leather industries. In general, the more industrialized of these nations process the raw materials into glue (or otherwise convert them into more advanced products). In the less-developed countries, however, where the domestic demand for glue is small, bones, hides, and other glue stock are usually exported.

Although cattle are not raised commercially in India, large numbers roam throughout the country. The dried bones of animals which have died a natural death are collected for export as a part-time occupation. Belgium is one of the major markets for these bones, where they are converted to ossein for the export trade.

Table 1.--Glue stock: 1/ U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Belgium	7,240	3,653	4,592	6,241	8,202	9,759
Argentina	84,421	51,148	50,806	49,713	71,273	53,827
Brazil	9,762	8,176	6,698	9,755	14,307	20,158
India	21,340	14,573	6,860	10,479	17,586	17,361
Canada	19,992	21,404	19,156	16,356	19,032	22,141
All other	34,449	28,342	14,948	13,963	9,769	16,620
Total	177,204	127,296	103,060	106,507	140,169	139,866
	Value (1,000 dollars)					
Belgium	1,541	737	959	1,558	2,488	2,894
Argentina	1,925	1,257	1,112	1,243	2,591	2,087
Brazil	488	395	303	410	827	1,419
India	904	542	283	502	1,097	751
Canada	369	265	193	235	310	459
All other	1,189	1,004	743	1,078	685	1,600
Total	6,416	4,200	3,593	5,026	7,998	9,210

1/ Includes raw materials used in the manufacture of gelatin and other products, as well as animal glue.

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

Note.--Statistics for 1964-67 are not strictly comparable with statistics for earlier years.

Table 2.--Glue stock: 1/ U.S. imports for consumption, by kind, 1962-67

Year	Total	Bones	Hide cuttings	Ossein	Glue stock 2/
		TSUS item			
		455.08	455.10	455.12	455.14
	Quantity (1,000 pounds)				
1962	177,204	147,150	19,428	6,489	4,137
1963	127,296	98,026	19,248	3,285	6,737
1964	103,060	73,860	15,073	4,690	9,437
1965	106,507	76,256	12,966	7,932	9,353
1966	140,169	107,148	15,876	7,932	9,213
1967	139,866	97,846	17,713	11,206	13,101
	Value (1,000 dollars)				
1962	6,416	4,116	711	1,486	103
1963	4,200	2,757	603	725	115
1964	3,593	1,820	429	1,028	316
1965	5,026	2,165	426	1,977	458
1966	7,998	4,554	566	2,504	374
1967	9,210	4,160	839	3,422	789

1/ Includes raw materials used in the manufacture of gelatin and other products, as well as animal glue.

2/ Not specially provided for.

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

Note.--Statistics on bones are not strictly comparable with statistics for earlier years.

Table 3.--Bones, crude, steamed, or ground: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Argentina	83,386	50,114	48,814	47,522	69,794	50,346
Brazil	9,453	8,176	6,130	6,822	11,880	17,036
India	21,340	14,573	6,860	10,404	17,586	16,998
Canada	5,013	3,605	5,480	7,114	5,452	9,886
All other	27,958	1/ 21,558	6,576	4,394	2,436	3,580
Total	147,150	98,026	73,860	76,256	107,148	97,846
	Value (1,000 dollars)					
Argentina	1,869	1,208	1,017	1,122	2,523	1,883
Brazil	475	395	281	292	713	1,199
India	904	542	283	484	1,097	733
Canada	100	34	40	82	89	165
All other	768	1/ 578	199	185	132	180
Total	4,116	2,757	1,820	2,165	4,554	4,160

1/ Includes 10,742 thousand pounds, valued at 219 thousand dollars, from Egypt.

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

Note.--Statistics for 1964-67 are not strictly comparable with statistics for earlier years.

Table 4.--Hide cuttings, raw, with or without hair: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Canada	11,859	12,512	9,714	8,290	9,837	9,503
Colombia	1,654	2,315	2,143	2,297	1,624	2,028
Argentina	1,035	923	974	423	1,196	1,836
Venezuela	710	542	707	433	426	821
Italy	2,107	1,070	687	606	1,142	496
All other	2,063	1,886	848	917	1,651	3,029
Total	19,428	19,248	15,073	12,966	15,876	17,713
	Value (1,000 dollars)					
Canada	219	192	125	141	184	261
Colombia	103	153	130	147	90	132
Argentina	57	45	43	22	53	96
Venezuela	48	33	42	21	31	74
Italy	135	61	41	36	83	36
All other	149	120	48	59	125	240
Total	711	604	429	426	566	839

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

Table 5.--Ossein: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Belgium	6,489	3,115	4,360	6,121	7,700	9,499
France	-	-	230	1,350	170	1,707
All other	-	170	100	461	62	-
Total	6,489	3,285	4,690	7,932	7,932	11,206
	Value (1,000 dollars)					
Belgium	1,486	707	952	1,522	2,436	2,875
France	-	-	55	347	49	547
All other	-	18	21	108	19	-
Total	1,486	725	1,028	1,977	2,504	3,422

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

Table 6.--Glue stock, not specially provided for: 1/ U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Brazil	254	-	568	2,816	1,921	2,814
Argentina	-	-	1,018	1,769	283	1,645
Italy	159	-	1,534	1,136	114	875
Uruguay	-	41	-	-	349	798
Colombia	103	588	782	832	695	796
Peru	-	-	123	189	424	660
Canada	3,120	5,287	3,926	951	3,743	2,753
All other	501	821	1,486	1,660	1,684	2,760
Total	4,137	6,737	9,437	9,353	9,213	13,101
	Value (1,000 dollars)					
Brazil	10	-	22	113	87	204
Argentina	-	-	53	98	14	108
Italy	8	-	95	72	31	85
Uruguay	-	2	-	-	19	54
Colombia	7	35	44	50	42	49
Peru	-	-	7	11	30	49
Canada	50	39	21	12	36	34
All other	28	39	74	102	115	206
Total	103	115	316	458	374	789

1/ Includes raw materials used in the manufacture of gelatin and other products, as well as animal glue.

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

Commodity	TSUS item
Refined gelatin:	
Edible	455.16, -.18, -.20
Photographic	455.22, -.24

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

U.S. consumption of refined gelatin increased during 1961-67 primarily owing to the increase in the domestic population. U.S. annual production, about 60 million pounds, valued at $40 million, constitutes 85 percent of domestic consumption. Imports of gelatin, which amounted to 11 million pounds in 1967, greatly exceed exports.

Description and uses

Gelatin is a protein obtained by the selective hydrolysis of collagen, the principal protein constituent of the white connective tissue of animal skins and bones. Refined gelatin is considered herein to refer only to the edible (including pharmaceutical) and photographic types, both of which are comparable to each other in purity. Inedible gelatin or animal glue (items 455.40 and 455.42), although made by similar processes, is much less pure and has entirely different uses, and accordingly is discussed in a separate summary. Isinglass or fish gelatin (item 455.06) is likewise discussed in a separate summary; although it is a relatively pure form of gelatin, it is obtained from a different raw material and by different processing methods than are the types of gelatin included herein.

The terms, Chinese gelatin and Japanese gelatin, are misnomers; the products to which they refer are more commonly called agar (item 455.02). Blasting gelatin and other explosive gelatins are not derived from animal sources.

Refined gelatin is marketed as a virtually odorless, light yellow to nearly colorless powder, or as a granulated product, containing about 10 percent of water. Its uses are dependent primarily on its gel-forming ability, its nutritive value, and the high strength of the films which it forms. Nearly three-fourths of its output is estimated to be used in food products (desserts, marshmallows, confectionery, meat products, bakery goods, and dairy products). Almost 20 percent of its production is used in photographic products, chiefly light-

sensitive paper and film, and the remainder by the pharmaceutical industry in capsules, ointments, cosmetics, blood substitutes, and the like. Photographic and pharmaceutical varieties are usually tailored to meet customer requirements. In addition, food grades must conform to regulations of the U.S. Food and Drug Administration, and pharmaceutical varieties must meet the specifications of the United States Pharmacoepeia (U.S.P. XIII). Gelatin is graded according to its jelly-strength as ascertained by the Bloom test. The jelly value is obtained by measuring the force in grams required to depress the surface of a specially prepared glue jelly a predetermined amount by a mechanically loaded plunger (Bloom gelometer). Commercial grades of gelatin range from 75 to 300 Bloom grams.

Gelatin is differentiated according to its method of manufacture as type A (acid process) gelatin and type B (alkaline process) gelatin. Most consuming industries use both types; in some applications, the two types may be used interchangeably, or even mixed. Pork skins are the usual raw material for type A gelatin and cattle bones, ossein (demineralized bone, item 455.12), calfskins, and other waste from the tanning industry, for type B. The acid process is a more rapid one, since the curing of the collagen prior to its conversion, an essential feature of both processes, requires only about one day in the acid process, but requires several weeks in the alkaline process.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Gelatin:		
	Edible:		
455.16	Under 40¢ per lb.--	1.6¢ per lb. + 8% ad val.	0.8¢ per lb. + 4% ad val.
455.18	40¢ to 80¢ per lb.----------	2.75¢ per lb. + 10% ad val.	1.3¢ per lb. + 5% ad val.
455.20	Over 80¢ per lb.---	4.25¢ per lb. + 12.5% ad val.	2¢ per lb. + 6% ad val.
	Photographic:		
455.22	Not over 80¢ per lb.----------	2.75¢ per lb. + 10% ad val.	1.3¢ per lb. + 5% ad val.
455.24	Over 80¢ per lb.---	4.25¢ per lb. + 12.5% ad val.	2¢ per lb. + 6% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption and production

The United States consumes about 70 million pounds of refined gelatin per year, valued at about $45 million. Approximately 50 million pounds are believed to have been consumed as food, 15 million pounds in photographic products, and the remainder (less than 5 million pounds) by the pharmaceutical industry.

Official statistics on the domestic production of refined gelatin are no longer available, but the current output is believed to be about 60 million pounds. Between 40 and 45 million pounds are probably food grade, between 10 and 15 million pounds, photographic grade, and less than 5 million pounds, pharmaceutical grade. There are 10 or more domestic producers, with plants in New England, New Jersey, and several Great Lakes States. Some of these organizations are large meat-packing firms, one is a major manufacturer of photographic products and supplies, and one is a producer of a varied line of food products; at least one derives its entire income from gelatin sales. A substantial portion of the domestic output is consumed captively, i.e., it is used by the manufacturer to make gelatin desserts, photographic films and papers, or other products.

Porkskins are believed to be the raw material for most of the domestically produced gelatin, with the output from hide pieces a close second. An important but relatively small amount of gelatin is produced from cattle bones, including demineralized bones (ossein).

U.S. imports

Imports of refined gelatin increased from 6.2 million pounds, valued at $3.1 million, in 1961 to 10.7 million pounds, valued at $6.5 million, in 1967 (table 1). Photographic-grade gelatin generally accounts for 15 or 20 percent of the total quantity imported; it accounts for a somewhat higher proportion of the total value of gelatin imports, however. Nearly all of the imports of photographic gelatin are in the 40-to-80-cents-per-pound value bracket, and their average unit value is

close to the upper limit of the bracket. For the other grades of refined gelatin, between 20 and 30 percent in 1961-65, and 15 to 20 percent in 1966-67, have been imported in the under-40-cents-per-pound value bracket, and almost all of the remainder in the 40-cents-to-80-cents-per-pound bracket.

As shown in table 2, the United Kingdom was the principal source in 1967 of imports of edible (i.e., food and pharmaceutical) gelatin. France and Belgium were major sources, and Australia and the Netherlands, secondary sources. France was the chief source of imports of photographic gelatin; the United Kingdom and Belgium were the only other significant sources.

U.S. exports

Official statistics on exports of refined gelatin are not strictly comparable to import statistics prior to 1965. Beginning in 1965, statistics are available only for edible (food and pharmaceutical grades) gelatin; these are shown in table 3. It is believed that edible gelatin accounts for nearly all of the U.S. exports of refined gelatin.

Exports of edible gelatin are much smaller than imports, and appear to be declining, whereas imports are increasing. Exports of edible gelatin amounted to 2.4 million pounds, valued at $1.8 million, in 1965 and to 1.4 million pounds, valued at $1.3 million, in 1967. Canada accounted for about 60 percent of total exports in 1965-67; Mexico was the only other major market.

Foreign production and trade

Most of the countries of Western Europe have well-established gelatin industries. Australia, Japan, and other industrialized countries also produce gelatin, as do less-developed countries, such as Argentina, that are major cattle producers.

Table 1.--Refined gelatin: U.S. imports for consumption, by kind and value bracket, 1961-67

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

Year	Total		Value bracket					
			Under 40¢ per lb.		From 40¢ to 80¢ per lb.		Over 80¢ per lb.	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Edible							
1961	5,263	2,352	1,981	588	3,282	1,763	1/	1
1962	6,270	2,938	1,916	576	4,354	2,362	1/	1/
1963	7,085	3,190	2,859	902	4,202	2,265	24	23
1964	6,226	2,725	2,341	703	3,882	2,018	3	4
1965	6,643	3,076	2,100	658	4,496	2,331	47	87
1966	8,150	4,401	1,555	509	6,571	3,860	24	32
1967	8,732	4,948	2,121	692	6,608	4,251	3	5
	Photographic							
1961	964	724	2/	2/	859	634	105	90
1962	1,166	854	2/	2/	1,107	803	59	51
1963	1,229	908	2/	2/	1,199	881	30	27
1964	1,434	1,067	2/	2/	1,403	1,039	31	28
1965	1,364	1,026	2/	2/	1,285	955	79	71
1966	1,991	1,512	2/	2/	1,894	1,417	97	95
1967	2,015	1,575	2/	2/	1,669	1,260	346	315
	Total							
1961	6,227	3,076	1,981	588	4,141	2,397	105	91
1962	7,436	3,792	1,916	576	5,461	3,165	59	51
1963	8,314	4,098	2,859	902	5,401	3,146	54	50
1964	7,660	3,792	2,341	703	5,285	3,057	34	32
1965	8,007	4,102	2,100	658	5,781	3,286	126	158
1966	10,141	5,912	1,555	509	8,465	5,277	121	127
1967	10,747	6,523	2,121	692	8,277	5,511	349	320

1/ Less than 500.
2/ Probably nil.

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

Note.--All imports of photographic gelatin reported as valued not over 80 cents per pound are assumed to be valued at from 40 cents to 80 cents per pound.

Table 2.--Refined gelatin: U.S. imports for consumption, by principal source, by type and value bracket, 1967

Source	Total	Edible			Photographic	
		Less than 40¢/lb.	40¢ to 80¢/lb.	More than 80¢/lb.	Not more than 80¢/lb.	More than 80¢/lb.
	Quantity (1,000 pounds)					
United Kingdom	4,179	1,677	2,220	-	282	1/
France	2,578	172	1,271	1/	1,085	50
Belgium	2,337	18	1,837	-	219	263
Australia	777	-	777	-	-	-
Netherlands	514	84	400	-	-	30
All other	362	170	103	3	83	3
Total	10,747	2,121	6,608	3	1,669	346
	Value (1,000 dollars)					
United Kingdom	2,291	546	1,536	-	208	1
France	1,792	57	856	2/	831	48
Belgium	1,506	10	1,102	-	163	231
Australia	463	-	463	-	-	-
Netherlands	285	24	233	-	-	28
All other	186	55	61	5	58	7
Total	6,523	692	4,251	5	1,260	315

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

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

Table 3.--Edible gelatin: U.S. exports of domestic merchandise, by principal markets, 1965-67

Market	1965		1966		1967	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars
Canada	1,444	866	1,319	1,007	950	759
Mexico	759	521	82	75	146	162
India	7	21	1/	1/	60	60
United Kingdom	1/	1/	19	22	32	61
Japan	40	118	1/	1/	1/	1/
Australia	40	53	1/	1/	37	40
Venezuela	19	31	41	55	25	31
All other	110	197	126	194	105	186
Total	2,419	1,807	1,587	1,353	1,355	1,299

1/ Not shown separately.

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

Commodity	TSUS item
Vegetable glue----------	455.30, -.32

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

U.S. consumption of vegetable glue, which is estimated at more than 400 million pounds, valued at $50-60 million, annually, is supplied almost entirely by domestic production. U.S. exports are believed to be small.

Description and uses

Vegetable glue includes three basic types of adhesives: (1) dextrine and other starch-derived adhesives; (2) protein adhesives, including soybean-protein adhesives; and (3) adhesives based on plant gums and mucilages.

Starch-derived adhesives can be differentiated as those which are essentially aqueous solutions of an unmodified or slightly modified starch, and those which are based on dextrine (item 493.30), a degradation product obtained by roasting starch or by treating it with acid or enzymes. Corrugated boxboard is the principal outlet for starch adhesives, while dextrine adhesives are used largely in making gummed envelopes, tapes, and labels. Corn, potato, and wheat starches, tapioca, and sago (items 132.35 to 132.55) are raw materials for these adhesives.

The second type of vegetable glue is based on the adhesive properties of the protein of certain seed and nut meal flours, principally soybean flour, but also including flours of cottonseed and peanut. The characteristics of soybean protein are such that adhesives made from it provide good bonding and dry rapidly, with little pressing and no heating required. Soybean-based adhesives are used to make water-resistant plywood and as a pigment binder for clay-coated paper, for paper-overlay gluing, and for other less-stringent adhesive applications.

Gums and mucilages are carbohydrate polymers obtained from plants. The term, gum, has been used to describe the dried exudates of trees and shrubs (e.g., gum arabic, item 188.36), as distinct from products extracted from the seed or roots which have been termed mucilages. The distinction has no chemical significance, however, and industry uses the term, gum, to describe both types of plant products. Vegetable glues based on plant gums are used as adhesives for much the same purposes as those derived from starch.

In addition to the basic starch, protein, or plant gums, vegetable glue formulations include solvents, thinners, catalysts, hardeners, fillers, extenders, and preservatives. Formulations vary from simple ones containing only a few of these additives to those of a complex nature, and are designed to make the glue more suitable for specific uses.

Vegetable glue, like animal glue (items 455.40 and 455.42), has faced increasing competition since World War II from adhesives based on synthetic resins (items 405.25 and 445.05 to 445.75). However, there are many industrial applications in which the replacement of vegetable glues by synthetic-resin adhesives in the near future is not anticipated.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Vegetable glue:		
455.30	Under 40¢ per lb---	1¢ per lb. + 12.5% ad val.	0.5¢ per lb. + 6% ad val.
455.32	Not under 40¢ per lb.	4¢ per lb. + 12.5% ad val.	2¢ per lb. + 6% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced in appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption, production, and trade

Statistics on consumption of vegetable glue in the United States are not available; however, inasmuch as imports amount to less than 1 percent of production, and exports are believed to be small, consumption is approximately equivalent to production.

Although statistics on production are likewise unavailable, the annual domestic output may be deduced from official statistics on shipments in 1963 (the only recent year for which such statistics are available). The quantity and value of shipments in 1963 as reported in the Census of Manufactures (except as noted) is shown in the following tabulation:

Type	Quantity 1,000 pounds	Value 1,000 dollars
Dextrine	200,169	19,301
Starch	82,248	7,238
Natural gum	1/ 50,000	11,141
Soybean protein	13,964	1,964
Mucilage	1/ 4,000	2,072

1/ Estimated.

In addition to the shipments of soybean-protein adhesives amounting to 14 million pounds shown in the tabulation, it is believed that an additional 75 million pounds was produced and shipped as composite animal blood-soybean protein adhesives. It thus appears probable that the annual U.S. production and consumption of vegetable glue is more than 400 million pounds, valued at between $50 and $60 million.

Virtually all of domestic production is by less than a dozen manufacturers, whose plants are situated in both Atlantic coast and Pacific coast States, as well as in some North Central States.

Nearly all imports of vegetable glue are valued under 40 cents per pound (see accompanying table). Imports fluctuate considerably from year to year, and ranged from 41,000 pounds, valued at $9,000, in 1961 to 295,000 pounds, valued at $38,000, in 1967. Although no one country has consistently been the principal supplier, either the Netherlands, West Germany, or Canada has been the chief source of imports in most of the years shown in the table.

Exports of vegetable glue are believed to be small, although probably greater than imports. Statistics are not available.

Vegetable glue: U.S. imports for consumption, by value bracket, 1961-67

(Quantity in pounds)

Country	1961	1962	1963	1964	1965	1966	1967
	Quantity valued under 40 cents per pound						
Netherlands	-	-	35,640	-	-	-	224,126
West Germany	4,261	38,169	27,323	17,269	41,943	17,692	66,700
Canada	32,245	7,545	2,876	42,322	-	6,122	3,323
United Kingdom	-	-	40,960	960	-	-	-
All other	441	1,102	-	1/ 50,807	-	-	
Total--							
Quantity	36,947	46,816	106,799	111,358	41,943	23,814	294,149
Value	$4,833	$7,071	$15,614	$16,743	$5,952	$3,374	$37,670
	Quantity valued 40 cents per pound or more						
Netherlands	-	-	-	-	-	-	-
West Germany	494	220	334	435	-	441	-
Canada	1,429	-	-	-	1,706	-	-
United Kingdom	1,320	227	374	252	583	1,686	244
All other	1,235	363	1,514	220	422	-	441
Total--							
Quantity	4,478	810	2,222	907	2,711	2,127	685
Value	$3,961	$881	$1,354	$773	$1,810	$2,072	$738
	Total quantity						
Netherlands	-	-	35,640	-	-	-	224,126
West Germany	4,755	38,389	27,657	17,704	41,943	18,133	66,700
Canada	33,674	7,545	2,876	42,322	1,706	6,122	3,323
United Kingdom	1,320	227	41,334	1,212	583	1,686	244
All other	1,676	1,465	1,514	1/ 51,027	422	-	441
Total--							
Quantity	41,425	47,626	109,021	112,265	44,654	25,941	294,834
Value	$8,794	$7,952	$16,968	$17,516	$7,762	$5,446	$38,408

1/ Includes 44,147 pounds (valued at $3,744) from Belgium.

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

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CASEIN GLUE

Commodity	TSUS item
Casein glue	455.34

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

U.S. consumption of casein glue is supplied almost entirely by U.S. production which, however, uses imported casein as its principal raw material. Exports of casein glue are small but larger than imports. In 1963 the value of shipments of U.S. production was in excess of $7 million.

Description and uses

Casein glue is a protein-type adhesive based on casein (item 493.15), the principal protein found in milk. Thus, it is readily distinguished from the animal glues of items 455.40 and 455.42, which are derived from other proteins. Casein glue is generally marketed in the form of a powder, in which the casein has been dry-mixed with an alkaline material (usually lime) and a sodium salt. The prepared glue also contains additives such as oils, fillers, thickeners or thinners, plasticizers, and preservatives. Purchase of pure casein by the industrial consumer, who then adds the same chemicals to produce a glue for his own use, is no longer a customary commercial practice. Blended casein glues, in which a part of the protein is furnished by soybean flour (item 184.52), blood albumin (item 190.10), or both, are also of commercial importance.

Because of its ability to form water-resistant bonds, casein glue is used to make plywood and other lumber laminates. In this use, it is in competition with soybean glue, synthetic resins, and other types of adhesives. The extent of the competition depends on characteristics such as relative strength of the bond, water resistance, and ease of application, as well as on cost considerations. A cost-versus-quality compromise is often achieved by blending casein with other types of adhesive materials. For plywood in general, casein has been largely replaced by synthetic resins and other adhesives not containing casein; however, casein glue and blended glues containing casein are still of major importance in the manufacture of certain kinds of plywood, as well as in the manufacture of sawn wood laminates for columns and beams designed as structural supports for churches, warehouses, and auditoriums.

Casein adhesives are also used in paper-bonding operations and in making such diverse products as bottle labels, cigarettes, aluminum foil-paper laminates, bookbindings, and paper bags.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
455.34	Casein glue----------	15% ad val.	7-1/2% ad val.

The rate effective January 1, 1972, represents the final stage of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rate shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption, production, and trade

The U.S. consumption of casein glue is approximated by production, inasmuch as exports are probably well below 5 percent of the value of production (1 percent in 1963) and imports are negligible. Official statistics on production in recent years are not available, but production is indicated by factory shipments in 1963 (the only recent year for which such data are available). According to official statistics of the U.S. Department of Commerce, shipments of casein glue in 1963 were valued at $7.2 million, which probably represented a volume of production of between 45 and 50 million pounds. Corresponding shipments in 1958 amounted to 34 million pounds, valued at $5.0 million.

Although virtually all of the casein glue consumed in the United States is produced domestically, all of the casein used in its manufacture is imported. Skim milk, from which casein is obtained in other countries, is used instead in the United States to produce nonfat milk solids and other dairy products. About three pounds of casein can be obtained from 100 pounds of milk.

U.S. exports of casein glue for the 4-year period, 1961-64, are shown in table 1; more recent export data are not available. Exports

ranged from 830,000 pounds, valued at $177,000, in 1962 to 436,000 pounds, valued at $110,000, in 1964. Based on a comparison with the preceding four years (1957-60), they appear to be declining. Canada was the principal market in 1961-64; other Western Hemisphere nations, and the Philippine Republic were other important markets.

Imports of casein glue are much smaller than exports. In most years, they amount to less than 100,000 pounds, and are valued at less than $20,000 (table 2). In most of the years shown in the table, West Germany was the only major source of these small imports.

Table 1.--Casein glue: U.S. exports of domestic merchandise, by principal markets, 1961-64 1/

Market	1961	1962	1963	1964
	Quantity (1,000 pounds)			
Mexico	81	40	23	88
Canada	182	590	262	78
Dominican Republic	6	12	17	60
Belgium	-	-	18	36
Panama	20	36	76	30
Philippine Republic	22	19	6	22
Venezuela	25	18	23	16
All other	106	115	98	106
Total	442	830	523	436
	Value (1,000 dollars)			
Mexico	18	10	8	24
Canada	34	105	51	18
Dominican Republic	1	4	6	14
Belgium	-	-	6	10
Panama	4	7	19	9
Philippine Republic	9	6	2	6
Venezuela	6	7	5	3
All other	39	38	29	26
Total	111	177	126	110

1/ More recent statistics are not available.

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

Table 2.--Casein glue: U.S. imports for consumption, total and principal source, 1961-67

Year	Total		West Germany	
	Quantity	Value	Quantity	Value
	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars
1961	42	25	31	18
1962	9	1	1	1/
1963	15	4	10	3
1964	27	4	25	3
1965	7	2	1/	1/
1966	106	19	103	16
1967	70	13	68	10

1/ Less than 500.

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

FISH GLUE

Commodity	TSUS item
Fish glue----------	455.36, -.38

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

Fish glue has not been produced in the United States since 1963. Currently, about 1 million pounds of imported fish glue, valued at roughly $200,000, is consumed annually in the United States.

Description and uses

Fish glue, like the animal glue discussed in the summary covering items 455.40 and 455.42, is a hydrolysis product of the protein, collagen. The raw material from which the collagen is obtained--fish skins and other waste products of the processing of food fish--distinguishes it from other animal glue, as well as from fish gelatin (see summary on isinglass, item 455.06). The latter is a much purer product made from the swimming bladders. Fish glue has only a relatively slight tendency to gel, and consequently is nearly always marketed as a cold liquid glue.

Dried films of fish glue are easily remoistened to develop instant tack with high holding power. This property is chiefly responsible for the principal use of fish glue, as an ingredient of adhesives for gummed tape. For this purpose it is blended, to the extent of about 10 percent of the glue formulation, with animal glue. Fish glue is also compatible with dextrine, polyvinyl acetate, and synthetic rubber latex, and is used either alone or in conjunction with these products in printing-press operations, in making paper boxes, and by the graphic arts as a photoengraving glue to make blueprint paper and etched plates.

Raw materials for the manufacture of fish glue are the heads, skins, and skeletal waste obtained in the processing of several species of food fish, principally ground fish. The same raw materials are also in great demand for processing into fish meal for use as an ingredient of pet food and other animal feeds. In making fish glue, the raw material is first washed to remove contaminants, and then extracted with hot water, either in open kettles or in pressure tanks. After the resultant glue liquor is allowed to settle and the grease is skimmed off, it is successively bleached, filtered, and concentrated to a viscous liquid having about 40 to 50 percent solids content. Preservatives

and odor-masking compounds are sometimes added.

Formerly, fish glue was the only adhesive available for use as a cold liquid. Many synthetic resin adhesives can be so used today, and have replaced fish glue in many uses.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Fish glue:		
455.36	Under 40¢ per lb--	0.5¢ per lb. + 7.5% ad val.	0.25¢ per lb. + 3.5% ad val.
455.38	40¢ per lb. or more.	4¢ per lb. + 12.5% ad val.	2¢ per lb. + 6% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. production, consumption, and trade

Fish glue has not been produced in the United States since 1963; in that year, it amounted to about 150,000 pounds. Domestic production had been declining continuously for more than a decade prior to 1963, and dropped sharply after 1958, when the major U.S. producer moved his operations to Canada.

Based on the estimated domestic production in 1961-63, and imports as shown in the accompanying table, the annual consumption of fish glue in the United States appears to have been about 1 million pounds, valued at $200,000, in 1961-67.

Imports increased generally from 828,000 pounds, valued at $133,000, in 1961 to 1.1 million pounds, valued at $252,000, in 1967.

Canada was the principal source of these imports, accounting for 60 or 70 percent of the total volume in most years. The United Kingdom, France, and Norway have been the only other significant sources. Virtually all of the imports have been in the lower of the two value brackets (i.e., valued less than 40 cents per pound).

Foreign production and trade

The production of fish glue has become established in several maritime nations with a substantial fishing industry as a means of profitably disposing of waste products from the processing of fish. However, in many parts of the world, these waste products are more in demand as a fertilizer material than as a raw material for the manufacture of glue, and in other countries a large part of the available supply is converted to fish meal and fish solubles for use in animal feeds. Data are not readily available as to the extent of fish glue production in foreign countries, but it is believed that the bulk of the production is by Canada and a few Western European nations.

Fish glue: U.S. imports for consumption, by principal source, 1961-67

Source	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
Canada	552	520	453	440	614	817	773
United Kingdom	111	82	105	151	121	122	188
France	-	89	156	44	135	90	67
Norway	165	197	34	76	48	-	55
All other	-	-	-	1/	-	-	-
Total	828	888	748	711	918	1,029	1,083
	Value (1,000 dollars)						
Canada	95	97	85	90	134	195	203
United Kingdom	14	10	14	24	18	18	28
France	-	12	22	7	22	15	12
Norway	24	31	4	11	8	-	9
All other	-	-	-	2/	-	-	-
Total	133	150	125	132	182	228	252

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

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

Note.--Official statistics for 1961-62 and for January-August, 1963 combined fish glue and glue size, if imports of these products were valued at less than 40 cents per pound, and combined fish glue, glue size, and animal glue, if imports of these products were valued at 40 cents per pound or more. Imports under the first combination are considered to have been all fish glue, and are the imports shown in the table. The negligible quantities imported under the second combination are considered to have been all animal glue and are not included.

Only a negligible quantity of fish glue valued at 40 cents per pound or more has been imported since August 1963.

Commodity	TSUS item
Animal glue and inedible gelatin--	455.40, -.42

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

The domestic consumption of animal glue is declining, primarily because of competition from newly developed synthetic resins and from vegetable glues. Domestic production is also declining; imports, however, have increased in recent years. In 1967, imports amounted to 25 million pounds and domestic production, to 81 million pounds. Exports were nominal.

Description and uses

The animal glues covered by this summary are substances with adhesive properties and are based on proteins of animal origin. The most important type is derived from collagen, the principal constituent of white connective tissue. (In commercial usage in the United States the term animal glue refers to this product.) Glue based on blood protein, although known as animal glue in common parlance, is referred to commercially as blood glue. This glue, whose primary adhesive constituent is the blood protein serum albumin, is the only other commercially important glue included herein.

This summary does not cover collagen-based glues derived from fish (see summary on fish glue, items 455.36 amd 455.38), nor does it cover casein glue (item 455.34), which is derived from protein found in milk. Edible gelatin and photographic gelatin (items 455.16 to 455.24), although derived from collagen by hydrolysis and in many other respects very similar to animal glue, are likewise discussed in a separate summary. These gelatins are much cleaner and purer products than animal glue, are made by more refined methods from more carefully selected raw materials, and have distinctly different uses.

Animal glue based on collagen is an amorphous, amber-colored substance obtained from collagen by hydrolysis. It is usually produced in granular form, but is also made as flakes, beads, or sheets. The distinction between such animal glue and inedible gelatin is ill-defined, but is sometimes made on the basis of purity and intended use; the two terms are generally used interchangeably, however. Technical gelatin is likewise a synonym for animal glue of this type.

Warm water solutions of collagen-based animal glue form strong, tough, rigid gels when cooled. This property is primarily responsible for its use as an adhesive, which is its principal use and which accounts for about 80 percent of its consumption in all uses. Adhesive applications include wood-joining operations such as the manufacture of furniture, as well as the making of gummed labels, abrasive papers and wheels, and a variety of other products. Animal glue is also used to size textile fibers; when used for this purpose, it is sometimes called technical (or inedible) gelatin. A recently developed use has been as a protective colloid in the microencapsulation of dyes in the manufacture of "no-carbon" paper.

Commercial designations of the various types of collagen-based animal glue are descriptive of the raw material used, e.g., hide glue, green bone glue, extracted (dry) bone glue. Quality is based chiefly on the gel strength, or rigidity, of the gel formed by the glue under certain standard conditions. (The gel strength is determined by the "gram test", which measures the weight in grams required to cause a predetermined depression in the gel.) In general, hide glue has higher gel strength than bone glues; the latter are used when films of the highest tensile strength are not required.

Commercial grades of dry animal glue derived from collagen contain about 10 to 20 percent of moisture and other impurities, and are frequently a blend of hide and bone glues, the gel strength of the blend being adjusted to the intended use. Such animal glue is also marketed in the form of liquid glues containing about 50 percent dry glue, 35 percent water, and between 10 and 20 percent of a liquefier such as thiourea; as flexible glues, in which a humectant has been added to the gel to prevent complete drying; and as opaque glues pigmented with titanium dioxide.

Glue based on blood protein is made by drying blood from which the fibrin has been removed and the hemoglobin converted to a metal complex, and to which a preservative has usually been added. The dried blood is a free-flowing powder ranging in color from dark red to black. (See summary covering dried blood, item 190.20, and dried blood albumins, item 190.10). When dispersed in a hot alkaline solution, the glue is ready for use. Calcium and magnesium salts are frequently added to cause the albumin to form insoluble proteinates, thus increasing the water resistance of the glue and improving other properties. Soluble silicates are added to prolong its working life.

Plywood manufacturers and the veneering industry have been the principal consumers of blood glue. They have not been generally used in the manufacture of furniture because of heat-curing requirements. The formulation of cold-press blood glues is a relatively recent development.

Raw materials for the manufacture of glue are termed glue stock, for a discussion of which see the summary covering items 455.08 to 455.14. They consist of hide trimmings, sinews, bones and similar waste products of tanneries and the meat-packing industry. (Dried blood and dried blood albumin are dutiable under the provisions of items 190.10 and 190.20.) The basic steps in extracting glue from hides and similar materials are: washing to remove dirt, salt, and other contaminants; curing with acid or alkali; cooking to hydrolyze the insoluble collagen, followed by water extraction of the glue; bleaching; concentration of the glue liquor; and drying. The curing step is unnecessary when bones are used as a raw material.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Inedible gelatin and animal glue:		
455.40	Under 40¢ per lb------	1.625¢ per lb. + 10% ad val.	0.8¢ per lb. + 5% ad val.
455.42	40¢ per lb. or more---	4¢ per lb. + 12.5% ad val.	2¢ per lb. + 6% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

ANIMAL GLUE

U.S. producers

Animal glue 1/ is produced in the United States by eight companies. The largest producer makes only animal glue and (through an affiliate) the related product, refined gelatin (items 455.16 to 455.24). Two of the other producers are large meat-packing firms which obtain raw materials as byproducts of their operations; a fourth producer derives most of its income from chemical products other than animal glue, and a fifth is primarily a fat renderer. Animal glue is the sole product of the other three producers, all of whom are small. Together the producers operate more than a dozen plants located in the northeastern part of the country, primarily in middle Atlantic and New England States and in Illinois.

U.S. production, consumption, and trade

Both production and consumption of animal glue have declined substantially during the last decade (table 1). Production decreased steadily from 109 million pounds in 1958 to 81 million pounds in 1967, or 26 percent. During the same period, apparent consumption declined irregularly from 119 million pounds to 105 million pounds, or 12 percent. The decline in the domestic demand for animal glue is largely due to the post-World War II development of synthetic resins and adhesives, which have not only prevented animal glue from participating to a significant extent in the rapidly growing plywood market but have also replaced animal glue in many of its established uses. Vegetable glues (items 455.30 and 455.32), such as starch and dextrine adhesives, have also made inroads on domestic sales of animal glue.

Virtually all animal glue produced and consumed domestically is believed to be valued at less than 40 cents per pound (corresponding to the lower of the two import value brackets).

Except for a sharp decline in 1961, imports have increased steadily from 11 million pounds, valued at $1.7 million, in 1958 to 25 million pounds, valued at $4.0 million, in 1961 (table 2). Less than 1 percent in any year were valued at 40 cents per pound or more. Imports supplied 9 percent of domestic consumption in 1958 and 24 percent in 1967. West Germany has been the principal source of imports, usually supplying

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1/ Since the working life of blood glue is short, it is formulated by the consumer immediately prior to use, and consequently is not generally an article of commerce. The following discussion of production and trade, therefore, refers only to the animal glue derived from collagen.
U.S. consumption of blood glue is probably between 25 and 50 million pounds per year.

nearly half of the quantity imported (table 3). The Netherlands and the United Kingdom have consistently been important sources; Poland and Brazil have been important suppliers in the most recent years. Glue is also imported from many other European and Latin American countries, from Australia, and from Japan. Imports from West Germany are substantially lower in average export value than imports from other sources.

Exports of animal glue from the United States are not reported separately in official statistics. They are probably small and not greater than 1 percent of domestic production (about 1 million pounds per year).

Foreign production and trade

Statistical information is not readily available on the extent to which animal glue is produced or traded in abroad. It is known, however, that all countries having substantial meat-packing or tanning industries produce animal glue. Methods for its extraction from animal waste products have been known and practiced in these countries for a long time, and do not require elaborate equipment or much highly skilled labor. A large number of the producing countries export a part of their domestic output.

Table 1.--Animal glue and inedible gelatin: U.S. production, imports for consumption, and apparent consumption, 1958-67

Year	Quantity			Ratio of imports to consumption
	Production	Imports 1/	Apparent consumption 2/	
	1,000 pounds	1,000 pounds	1,000 pounds	Percent
1958	109,069	11,115	119,184	9.3
1959	106,870	15,167	121,037	12.5
1960	103,256	17,424	119,680	14.6
1961	98,498	9,940	107,438	9.3
1962	93,258	12,506	104,764	11.9
1963	92,814	18,761	110,575	17.0
1964	97,607	19,980	116,587	17.1
1965	91,666	23,356	114,022	20.5
1966	89,059	23,955	112,014	21.4
1967	80,909	24,658	104,567	23.6

1/ May include a negligible quantity of fish glue and glue size, 1958-63.
2/ Assuming exports of 1 million pounds annually.

Source: Production, 1958-63 and imports, official statistics of the U.S. Department of Commerce; production, 1964-67, National Association of Glue Manufacturers, Inc. (does not include output of one manufacturer of bone glue).

Note.--Official import statistics for 1961-62 and for January-August 1963 combined animal glue, fish glue, and glue size, when imports of these products were valued at 40 cents per pound or more. The negligible quantities reported under this combination are considered to have been all animal glue and are included in the table.

Table 2.--Animal glue and inedible gelatin: U.S. imports for for consumption, total and by value bracket, 1958-67

Year	Total		Valued--			
			Under 40¢/lb.		40¢/lb. or more 1/	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars
1958	11,115	1,700	11,104	1,694	11	6
1959	15,167	2,253	15,091	2,165	76	88
1960	17,424	2,718	17,336	2,646	88	72
1961	9,940	1,726	9,883	1,685	57	41
1962	12,506	2,037	12,494	2,027	12	10
1963	18,761	2,691	18,711	2,686	51	6
1964	19,980	2,983	19,973	2,978	7	5
1965	23,356	3,384	23,341	3,375	15	9
1966	23,955	3,587	23,942	3,573	13	14
1967	24,658	4,004	24,616	3,984	42	20

1/ May include some fish glue and glue size.

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

Table 3.--Animal glue and inedible gelatin: U.S. imports for consumption, by principal source, 1961-67 [1/]

Source	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
West Germany	4,506	6,048	10,558	8,444	7,910	10,342	11,414
Netherlands	1,987	1,816	2,015	3,592	3,436	3,946	3,961
United Kingdom	1,411	2,578	2,209	2,777	2,328	894	3,825
All other	2,036	2,064	3,979	5,167	2/9,682	3/8,773	4/5,458
Total	9,940	12,506	18,761	19,980	23,356	23,955	24,658
	Value (1,000 dollars)						
West Germany	674	831	1,336	1,180	1,037	1,413	1,641
Netherlands	407	379	422	636	665	754	827
United Kingdom	263	463	371	473	344	151	634
All other	382	364	562	694	2/1,338	3/1,269	4/ 902
Total	1,726	2,037	2,691	2,983	3,384	3,587	4,004

1/ May include a negligible quantity of fish glue and glue size, 1961-63.

2/ Includes 4,452 thousand pounds, valued at 526 thousand dollars, from Brazil.

3/ Includes 3,221 thousand pounds, valued at 382 thousand dollars, from Brazil.

4/ Includes 1,471 thousand pounds, valued at 152 thousand dollars, from Poland.

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

GLUE SIZE

Commodity	TSUS item
Glue size----------	455.44, -.46

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

About 100 million pounds of glue size, valued at between $10 and $15 million, is consumed annually in the United States. Nearly all of this is supplied by domestic production. Imports are negligible; exports, if any, are very small.

Comment

Glue size is a preparation based on vegetable, casein, animal or fish glue (items 455.30 to 455.42) and sometimes contains additives such as softening agents, dispersants, wetting agents, lubricants, fillers, and preservatives. It is used principally by the paper and textile industries.

In the manufacture of paper, glue size is used only for surface-sizing, which imparts water- and abrasion-resistance, creasibility, and smoothness to the finished product, increases and improves its printability, and decreases the porosity. Internal sizing, which increases resistance to the penetration of water and other liquids, is accomplished by rosin size.

In textiles, glue size is applied to warp yarns in order to strengthen and protect them during the weaving operation; it is removed later from the woven fabric. It is also used to stiffen fabrics, straw hat bodies, and carpet backing; shellac and other natural resins, as well as synthetic resins, often replace glue size for these purposes.

Miscellaneous uses of glue size include its use as a size for plaster walls prior to painting them, and as an adhesive for installing wall paper.

GLUE SIZE

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Glue size:		
455.44	Under 40¢ per lb.-----	0.5 cents per lb. + 7.5% ad val.	0.25 cents per lb. + 3.5% ad val.
455.46	40¢ per lb. or more--	4 cents per lb. + 12.5% ad val.	2 cents per lb. + 6% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. imports of glue size are negligible and exports are probably so. Domestic consumption and production are thus virtually equal. Statistics on domestic production in recent years are incomplete, and are available only for 1958 and 1963. According to published data of the U.S. Department of Commerce, production and shipments 1/ in those years were as follows:

	1958	1963
Production (1,000 pounds)-----	105,068	1/
Shipments:		
Quantity (1,000 pounds)-----	104,633	1/
Value (1,000 dollars)-------	13,145	10,364

1/ Not available.

The current domestic output is probably about 100 million pounds per year, valued at between $10 and $15 million.

1/ Reported as sizes (including dextrine size) other than resin size.

Imports of glue size were not reported in official statistics prior to August 31, 1963. There were no imports in 1964, the first full year for which such statistics were available; imports for 1965-67 are shown in the accompanying table. Virtually all of these small imports were valued at less than 40 cents per pound. India, West Germany, the United Kingdom, and the Netherlands were the principal sources.

Glue size: U.S. imports for consumption, by principal source, 1965-67

Source	1965	1966	1967
	Quantity (pounds)		
India	-	-	25,000
United Kingdom	-	25,000	25,480
West Germany	254	46,224	44,325
Netherlands	30,000	-	-
All other	1/ 99	2/ 44	3/ 2,400
Total	30,353	71,268	97,205
	Value		
India	-	-	$10,634
United Kingdom	-	$4,066	5,191
West Germany	$335	10,592	5,136
Netherlands	3,480	-	-
All other	1/ 133	2/ 475	3/ 720
Total	3,948	15,133	21,681

1/ All from Switzerland.
2/ All from France.
3/ All from Canada.

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

Commodity	TSUS item
Enfleurage greases, floral essences, floral concretes, and other non-alcoholic aromatic substances obtained by enfleurage, maceration, or extraction	460.05

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S: trade position

Enfleurage greases, floral essences, and similar products are important raw materials for the manufacture of perfume. The United States imports all its requirements, which in recent years have amounted to about 100,000 pounds per year, valued at between $3 and $4 million.

Description and uses

This summary covers primarily floral essences (essential oils responsible for the fragrance of a flower) which have been obtained from the flower by absorption in cold fat (enfleurage), in hot fat (maceration), or by extractions with volatile solvents, and which do not contain alcohol. It also covers essences similarly obtained from plant parts other than flowers. Concentrates of essential oils in fats are termed enfleurage greases; those prepared by solvent extraction followed by evaporation of the solvent are termed floral concretes. Essential oils obtained by steam distillation or by expression are discussed elsewhere (see summaries, items 452.02-452.80). The substances included herein are chiefly used in the manufacture of perfumes, cosmetics or toilet preparations (items 461.05-461.45), but are not themselves so marketable. They are also used in soaps. Perfumes and toilet waters are produced generally by extending the concentrated base with alcohol.

Enfleurage is carried out almost exclusively in the Grasse region of southern France, where it is still practiced, but on a smaller scale than in former years. The cold fat or enfleurage process of obtaining the natural flower oil is restricted to those flowers (jasmine, tuberose, and a few others) which, after picking, continue their physiological activities in forming and emitting fragrance. For such flowers, enfleurage gives a much greater yield of flower oil than other methods. Despite this advantage, enfleurage has lately been replaced by extraction with volatile solvents because enfleurage is a very delicate and lengthy process, requiring much experience and labor. In the past the hot fat or maceration process was employed on those flowers

which gave a very small yield by distillation or by enfleurage, but this method has likewise been largely superseded by the modern process of solvent extraction. Of general application, the volatile solvent process is today applied to many types of flowers, and carried out in several countries. It is technically the most advanced process, yielding concretes and alcohol soluble absolutes, the odor of which is that of the natural flower oil as it occurs in the living flower.

U.S. tariff treatment

Non-alcoholic, aromatic substances imported under the provision of item 460.05 are free of duty. This duty-free treatment is bound in the General Agreement on Tariffs and Trade.

U.S. consumption, production, and trade

Available information indicates that there is no U.S. production and, therefore, no exportation of non-alcohol enfleurage greases, floral essences, and concretes. As a consequence, consumption closely follows imports.

France and Switzerland supply about 95 percent of U.S. requirements for natural flower oils; Italy and Yugoslavia are minor but significant sources, and there are five or ten other suppliers. In terms of value, imports from France usually account for 75 to 80 percent of annual imports; in 1967 they accounted for $2.6 million out of a total of $3.3 million. During the period 1962-67 the value of imports from all sources increased from $1.1 million in 1962 to $3.5 million in 1966, then decreased to $3.3 million in 1967. Statistics on imports by country are given in the accompanying table. The general increase is believed to be due to the increasing acceptability of perfume products for use by men.

Foreign production and trade

France, Switzerland, and Italy are the world's major producers of natural flower oils, with France the major producer in both quantity and variety. Only a very small amount of material comes from outside of this area, and it is usually the essence of a plant native or peculiar to a particular region. Cheap labor is characteristic of the regions where natural flower oils are produced by the older methods. Small amounts of various natural flower oils are produced in Spain, the U.S.S.R., Yugoslavia, India, Malaysia, Madagascar, Sicily, Bulgaria, Turkey, Egypt, Syria, Algeria, Australia, Ethiopia, and the United Kingdom, the Netherlands, and West Germany. Shipments of these materials go, for the most part, to either France or the United States. Not all of these countries produce each year and, when they do, the entire annual output is exported in one small shipment.

Enfleurage greases and related products: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
France	4	5	30	94	94	88
Switzerland	1/	1/	4	1	1	3
Yugoslavia	1/	-	1/	1	1	3
Italy	1/	1/	1/	1/	1/	1/
All other	1/	1/	1/	6	7	5
Total	5	6	35	102	103	99
	Value (1,000 dollars)					
France	666	1,063	1,899	2,496	2,768	2,582
Switzerland	346	288	352	422	525	593
Yugoslavia	5	-	1	15	12	77
Italy	88	83	111	68	172	50
All other	19	49	10	48	40	35
Total	1,124	1,483	2,373	3,049	3,517	3,337

1/ Less than 500 pounds.

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

Commodity	TSUS item
Ambergris	460.10
Castoreum	460.20
Civet	460.30
Musk, grained or in pods	460.60

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

As there is no production in the United States of the perfume fixatives covered by this summary, the domestic perfume industry is wholly dependent on imported materials. Their value varies from about $200,000 to more than $300,000 per year. In terms of value, civet is generally the most important and castoreum the least important, of the imports considered.

Description and uses

This summary covers four aromatic or odoriferous substances--ambergris, castoreum, civet, and musk. These substances comprise the commercially significant natural perfume fixatives of animal origin. The summary also covers mixtures composed of any one of these fixatives and 10 percent or less (by weight) of alcohol. Other non-benzenoid and non-quinonoid fixatives, and mixtures of fixatives with alcohol or other substances or with each other, are provided for in items 460.80, 460.85, or 460.90. Artificial musk is provided for in item 408.30; other benzenoid or quinonoid fixatives are provided for in item 408.60. Fixatives are used in compounding perfumes (items 461.30 and 461.35) principally to prevent the too rapid evaporation of more volatile substances. Because of their extreme potency, only very small proportions of fixatives are required in compounding perfumes.

Ambergris is a white, ash-grey, yellow, black or variegated substance with a characteristic odor, and the consistency of wax. It is formed as a morbid secretion of the sperm whale, but is generally found floating on the surface of tropical oceans or cast upon a beach. Castoreum refers both to the dried perineal glands of the beaver and to the odoriferous substance obtained from them. Civet is a complex mixture of fats and oils obtained from a gland of the civet cat. It has the consistency of butter or honey, is clear, yellowish, or brownish in color, and has a strong musky odor. Musk pods are the dried glands of the male musk deer. The contents of the pods, when reduced to a coarse powder are termed grained musk. The musk pods have a penetrating and persistent odor, and when fresh are brown in color and oily

in texture. In the manufacture of perfume, musk is considered to be the most important of the natural perfume fixatives.

Animal fixatives are added to perfumes in the form of a tincture which generally contains 4 ounces of fixative to a gallon of alcohol. Such tinctures are provided for in item 460.90 and are discussed in a separate summary.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
460.10	Ambergris	8% ad val.	4% ad val.
460.20	Castoreum	20% ad val.	10% ad val.
460.30	Civet	16% ad val.	8% ad val.
460.60	Musk	20% ad val.	10% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption, production, and trade

Available information indicates that there is no U.S. production or exportation of the natural perfume fixatives discussed herein. Therefore, consumption closely approximates imports. Synthetic substitutes for each natural product have been developed and are becoming increasingly important.

U.S. imports

U.S. imports of the perfume fixatives of animal origin discussed herein in 1967 were valued at $268,112, of which $61,961 represented ambergris; $3,840, castoreum; $153,855, civet; and $48,456, musk (table 1).

Because of the fortuitous circumstances under which ambergris is found, U.S. imports originate in many countries, and the quantity imported fluctuates greatly from year to year. In the period, 1962-67, the value of U.S. imports of ambergris ranged from $11,000 in 1962 to $141,000 in 1965 (table 2). France has been the principal source of U.S. imports; however, these imports were probably material that originated elsewhere but was cleaned, graded, and placed in marketable condition by French suppliers of perfume materials. Various Arabian states and countries with maritime fleets supply nearly all of the remainder of U.S. imports.

Virtually all castoreum imported by the United States comes from Canada. In recent years, imports have ranged in value between $2,000 in 1963 and 1964 and $9,000 in 1965 (table 3).

France and Ethiopia are the only major suppliers of civet to the United States. As with ambergris, it may be that imports from France are of material originating elsewhere and merely cleaned and graded in France. Imports of civet into the United States increased irregularly from 12,000 ounces, valued at $83,000, in 1962, to 23,000 ounces, valued at $154,000, in 1967 (table 4).

Virtually all musk is imported from India. The value of imports in recent years has ranged from $2,000 in 1965 to $111,000 in 1966 (table 5).

Foreign production and trade

World production of perfume fixatives of animal origin is variable and small, and can scarcely be expanded since these products are all obtained from wild animals whose numbers are declining. Ambergris is quite rare, the supply depending on its extraction from sperm whales, or its accidental discovery when it is found floating on the surface of the sea or cast up on a beach. Ethiopia is the principal habitat of the civet cat which is hunted solely for the glandular substance it produces. Canada, the home of the American beaver from which the best castoreum is obtained, is its major supplier. However, beaver are also native to the Siberian region of the U.S.S.R. The musk deer, from which musk is obtained, inhabits the mountains of the eastern regions of Central Asia (Tibet, India, and China) but is in danger of becoming extinct. It appears quite probable that world production of perfume fixatives of animal origin will steadily decline, and that they will be increasingly substituted for by synthetic materials.

Table 1.--Natural perfume fixatives: U.S. imports for consumption, by kind and principal source, 1967

Source	Total	Ambergris	Castoreum	Civet	Musk
	Quantity (ounces)				
France	12,681	2,241	-	10,393	47
Ethiopia	11,344	-	-	11,344	-
India	348	-	-	-	348
Canada	22,464	-	22,464	-	-
All other	11,467	1/6,476	-	841	2/4,150
Total	58,304	8,717	22,464	22,578	4,545
	Value				
France	$94,078	$17,465	-	$76,251	$362
Ethiopia	72,279	-	-	72,279	-
India	40,532	-	-	-	40,532
Canada	3,840	-	$3,840	-	-
All other	57,383	1/44,496	-	5,325	2/7,562
Total	268,112	61,961	3,840	153,855	48,456

1/ Includes 3,282 ounces, valued at $16,301, from New Zealand, and 1,344 ounces, valued at $11,222, from Portugal.

2/ Probably not true natural musk.

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

Table 2.--Ambergris : U.S. imports for consumption, with value, by principal source, 1962-67

Year	Total		Principal sources
	Quantity	Value	
	Ounces		
1962	178	$10.685	France, $6,117; Norway, $2,918.
1963	1,507	21,098	France, $13,020; Arabia Peninsula States 1/, $5,739; Aden, $1,196.
1964	3,733	27,712	France, $11,028; Aden, $7,913; Arabia Peninsula States 1/, $7,680.
1965	17,648	141,060	France, $83,441; Egypt, $16,000; United Kingdom, $15,646; Aden, $12,946.
1966	3,873	31,072	France, $24,661; Japan, $6,411.
1967	8,717	61,961	France, $17,465; New Zealand, $16,301; Portugal, $11,222; United Kingdom, $7,828.

1/ Other than Aden, Southern Yemen, Bahrein, Kuwait, and Saudi Arabia.

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

Table 3.--Castoreum: U.S. imports for consumption, by sources, 1962-67

Year	Total		Canada		France	
	Quantity	Value	Quantity	Value	Quantity	Value
	Ounces		Ounces		Ounces	
1962 1/	17,777	$6,469	17,777	$6,469	-	-
1963	5,816	1,556	5,816	1,556	-	-
1964	7,563	1,585	7,508	1,363	55	$222
1965	60,492	9,077	56,492	8,817	4,000	260
1966	16,424	7,201	16,246	5,753	178	1,448
1967	22,464	3,840	22,464	3,840	-	-

1/ Statistics on castoreum and civet were combined in January-June 1962. Imports shown include all imports from Canada under the combined classification.

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

Table 4.--Civet: U.S. imports for consumption, by principal source, 1962-67

Source	1962 1/	1963	1964	1965	1966	1967
	Quantity (ounces)					
France	2,050	3,399	8,699	6,888	14,927	10,393
Ethiopia	10,359	10,761	13,347	13,640	10,994	11,344
All other	-	-	2/ 2,641	523	32	3/841
Total	12,409	14,160	24,687	21,051	25,953	22,578
	Value					
France	$20,516	$32,495	$60,478	$50,062	$96,212	$76,251
Ethiopia	62,894	75,036	115,142	115,090	95,538	72,279
All other	-	-	2/17,549	2,029	507	3/5,325
Total	83,410	107,531	193,169	167,181	192,257	153,855

1/ Statistics on castoreum and civet were combined in January-June 1962. Imports shown include all imports under the combined classification, except those from Canada.

2/ Includes 1,500 ounces, valued at $9,833, from India; and 1,000 ounces, valued at $6,691, from Spain.

3/ Includes 700 ounces, valued at $4,079, from Spain.

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

Table 5.--Musk: U.S. imports for consumption, total and from India, 1962-67

Year	Total		India	
	Quantity	Value	Quantity	Value
	Ounces		Ounces	
1962	464	$100,804	448	$100,585
1963	544	64,797	544	64,797
1964	86	8,582	86	8,582
1965	16	2,037	16	2,037
1966	920	110,960	920	110,960
1967	4,545	48,456	348	40,532

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

Note.--An analysis of the average unit value of reported imports indicates that only those from India are true natural musk.

Commodity	TSUS item
Aromatic or odoriferous substances containing no alcohol or not over 10 percent alcohol by weight:	
Not artificial mixtures (other than substances admixed with alcohol):	
Anethol	460.15
Citral	460.25
Geraniol	460.35
Hydroxycitronellal	460.45
Ionone	460.50
Linalyl acetate	460.55
Rhodinol	460.65
Safrol	460.70
Terpineol	460.75
Other	460.80
Artificial mixtures	460.85
Aromatic and odoriferous substances containing over 10 percent alcohol by weight	460.90

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

The group of approximately 200 chemicals covered in this summary is of considerable importance to the 40 or so domestic producers of perfume and flavor materials, and of moderate importance in international trade. Imports in 1967 amounted to over $11 million, approximately one-fourth the value of domestic production; and exports are believed to be greater than imports.

Description and uses

This summary covers certain natural and synthetic aromatic or odoriferous substances. The natural substances covered are known as isolates; these are components of essential oils or other plant materials which have been isolated--i.e., separated--from other components. The synthetics are products similar in composition or characteristics to isolates, but are made chemically. This summary covers all isolates except coumarin, methyl salicylate, and vanillin, and all synthetics except those derived from raw materials having a benzenoid, quinonoid, or modified benzenoid structure (items 408.05-408.80). It also covers artificial mixtures of aromatic or odoriferous

substances. Not covered by this summary are the commercially significant natural perfume fixatives (items 460.10, 460.20, 460.30, and 460.60), enfleurage greases, and certain floral essences (item 460.05), distilled or expressed essential oils (items 452.02-452.80), or heliotropin (items 408.20 and 460.40).

Some perfumery substances can be more economically obtained from a natural source than by synthesis; examples are geraniol from palmerosa oil, and safrol from camphor oil. Other naturally occurring substances can be synthesized cheaper than they can be isolated. For example, linalyl acetate is present in lavender and bergamot oils but can be more economically made from acetic acid and linalool; terpineol, although found in several essential oils, is less expensive when synthesized from turpentine. Some perfumery substances do not exist in nature, but are derived from natural substances. Examples are ionone, synthesized from citral and acetone; and hydroxycitronellal, obtained by hydrating citronellal.

None of the approximately 200 chemicals covered by this summary is themselves marketable as perfumery, cosmetics, or toilet preparations (items 461.05-461.45) but are chiefly used (generally in blends of two or more) as perfume and flavor materials in cosmetics, perfumes, food, and medicinals, because of their pleasant and distinctive odors or flavors. Each chemical so used has a highly distinctive characteristic fragrance. Mixtures of these chemicals also have distinctive fragrances, and usually are prepared according to a customer's special requirements. The characteristic fragrance of any such mixtures is very difficult to duplicate and generally the mixtures are not substitutable. For this reason, price differentials generally have little effect on the substitution of one chemical for another in the preparation of aromatic fragrances.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
460.15	Anethol----------	24% ad val.	12% ad val.
460.25	Citral----------	24% ad val.	12% ad val.
460.35	Geraniol----------	15% ad val.	7.5% ad val.
460.45	Hydroxycitronellal--	15% ad val.	7.5% ad val.
460.50	Ionone----------	24% ad val.	12% ad val.
460.55	Linalyl acetate-----	36% ad val.	18% ad val.
460.65	Rhodinol----------	24% ad val.	12% ad val.
460.70	Safrol----------	30% ad val.	15% ad val.
460.75	Terpineol----------	24% ad val.	12% ad val.
460.80	Other----------	24% ad val.	12% ad val.
460.85	Artificial mixtures.	16¢ per lb. + 12% ad val.	8¢ per lb. + 6% ad val.
460.90	Mixtures containing over 10 percent alcohol.	16¢ per lb. + 15% ad val.	8¢ per lb. + 7.5% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption

Information on the domestic consumption of nonbenzenoid perfume and flavor materials is not available because available statistics include data for individual synthetic materials, but not for artificial mixtures. Data are available, however, for imports of these mixtures.

Estimates based on available production and import data indicate that domestic consumption of the substances included here has increased by at least 100 percent in the period 1962-67. This increase is the result of the increased volume of personal toilet and cosmetic articles manufactured, and the increased use of fragrances in nonpersonal items, such as pesticides, household detergents, and air-fresheners.

U.S. producers

Forty companies produce the approximately 200 synthetic flavor and perfume substances included in this summary; however, a total 12 companies (only 4 of which are exclusively flavor and perfume material producers), each producing at least 1 million pounds, accounted for approximately 80 percent of the value of production in 1966. A few of the country's largest manufacturers of synthetic organic chemicals produce large quantities of only a few of the synthetic flavor and perfume chemicals included in this summary. Most of the chemical producers specializing in flavor and perfume materials are located in the metropolitan New York area; some are U.S. affiliates of European companies.

U.S. production

Total annual production in 1966 of the perfume and flavor materials included herein is estimated to be about 33 million pounds with a value of approximately $43 million. In the period 1961-66 total value of production of the individual substances anethol, citral, geraniol, hydroxycitronellal, ionone, linalyl acetate, rhodinol, and terpineol ranged from $6.4 million in 1961 to $10.0 million in 1963 (table 1). There are no available statistics on domestic production of artificial mixtures of aromatic and odoriferous substances.

U.S. imports and exports

Imports of aromatic and odoriferous substances included in this summary have more than doubled between 1962 and 1967. The major part of imports has consisted of mixtures of substances containing either natural or synthetic odoriferous substances, or both (table 2). In the period 1962-67 France and Switzerland were the source of 80 to 90 percent of the total imports (table 3). Other consistent major sources included Japan, the Netherlands, West Germany, and the United Kingdom.

Aggregate annual exports of the domestically produced substances included in this summary are not classified individually in the official statistics, but are believed to be larger than imports. The Netherlands, Switzerland, Canada, the United Kingdom, France, and Japan have been the principal export markets for U.S. flavor and perfume chemicals. It is not known what share of the exports has consisted of substances shipped individually or as mixtures.

Foreign production and trade

The isolation and synthesis of most of the chemicals considered here are carried out in countries having well-developed chemical industries. Most of this manufacture is done in France, Switzerland, Japan, the Netherlands, West Germany, the United Kingdom, and the United States. Switzerland and Germany were the first to develop the manufacture of synthetic fragrances. The United States, France, and Switzerland are currently the world's three dominant producers and exporters of the isolates and synthetics employed in fragrances.

Table 1.--Aromatic and odoriferous substances and mixtures: U.S. production, 1961-66

Commodity	1961	1962	1963	1964	1965	1966
	Quantity (1,000 pounds)					
Anethol 1/	1,082	1,269	1,393	1,576	1,904	1,983
Citral	89	166	229	218	171	316
Geraniol	578	511	551	845	634	1,117
Hydroxycitronellal	265	396	506	556	454	513
Ionone	265	215	293	206	262	340
Linalyl acetate	269	332	423	659	2/	2/
Rhodinol	16	14	13	10	12	11
Terpineol	3,438	3,555	3,284	3,532	3,418	3,543
Total	6,002	6,458	6,692	7,602	6,855	7,823
	Value (1,000 dollars)					
Anethol 1/	617	888	1,087	1,198	1,352	1,289
Citral	430	837	934	855	614	1,220
Geraniol	746	879	1,025	1,293	875	1,463
Hydroxycitronellal	1,142	1,940	2,849	2,552	1,830	1,970
Ionone	1,214	1,137	1,321	826	875	1,115
Linalyl acetate	820	1,208	1,578	2,082	2/	2/
Rhodinol	580	456	377	278	339	298
Terpineol	894	995	854	883	1,025	1,134
Total	6,443	8,340	10,025	9,967	6,910	8,489

1/ Anethol, as well as safrol, although benzenoid in structure, is derived commercially from a nonbenzenoid source and is therefore included here; statistics on safrol are not available.

2/ Not available.

Source: Compiled from official statistics of the U.S. Tariff Commission.

Table 2.--Aromatic and odoriferous substances and mixtures: U.S. imports for consumption, by kind, 1962-67

Kind	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Anethol	1/	1/	1	1/	-	-
Citral	1/	1/	1/	1/	1	4
Geraniol	16	32	4	4	7	12
Hydroxycitronellal	39	27	2	4	4	7
Ionone	1/	1/	4	2	2	1
Linalyl acetate	1	-	1	180	2	4
Rhodinol	1/	1/	-	4	-	1
Safrol	19	7	-	1/	-	3
Terpineol	1/	1/	1	54	1/	1/
All other aromatic chemicals 2/	132	186	146	220	391	539
Mixtures of aromatic chemicals	267	442	510	467	456	616
Aromatic substances 3/ containing over 10 percent alcohol	1/	3	22	17	11	30
Total	474	697	691	952	874	1,217
	Value (1,000 dollars)					
Anethol	4/	4/	2	3	-	-
Citral	1/	4/	4/	4/	3	10
Gernaniol	23	46	12	8	13	20
Hydroxycitronellal	175	149	14	20	14	25
Ionone	4/	4/	11	12	12	6
Linalyl acetate	6	2	8	36	10	11
Rhodinol	4/	4/	4	45	8	10
Safrol	7	3	3	10	4/	7
Terpineol	4/	1/	4/	14	-	-
All other aromatic chemicals 2/	393	522	519	734	1,125	1,283
Mixtures of aromatic chemicals	3,646	4,869	6,349	6,362	6,844	9,112
Aromatic substances 3/ containing over 10 percent alcohol	4/	54	580	439	350	639
Total	4,250	5,645	7,502	7,683	8,379	11,123

1/ Less than 500 pounds.
2/ Probably contains some benzenoid material as well as nonbenzenoid.
3/ Contains both benzenoid and nonbenzenoid material.
4/ Less than $500.

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

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Table 3.--Aromatic and odoriferous substances and mixtures: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
France	179	231	272	236	269	268
Switzerland	104	230	280	301	256	393
Japan	77	52	11	19	19	18
Netherlands	18	22	14	12	12	20
West Germany	41	51	62	78	84	115
United Kingdom	21	45	15	14	192	314
All other	34	66	37	1/292	42	89
Total	474	697	691	952	874	1,217
	Value (1,000 dollars)					
France	2,906	3,477	4,635	4,030	4,223	4,531
Switzerland	911	1,614	2,522	3,116	2,842	4,443
Japan	114	105	67	128	154	118
Netherlands	89	104	93	53	85	130
West Germany	98	99	94	165	182	292
United Kingdom	61	118	43	79	776	963
All other	71	128	48	1/112	117	646
Total	4,250	5,645	7,502	7,683	8,379	11,123

1/ In 1965 imports of linalyl acetate from Ceylon and Indonesia totaled 67 thousand pounds, valued at 14 thousand dollars, and 112 thousand pounds, valued at 14 thousand dollars, respectively.

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

Commodity	TSUS item
Bath salts, whether or not having medicinal properties:	
Not perfumed	461.05
Perfumed	461.10
Bay rum or bay water	461.15
Cosmetics and other toilet preparations:	
Not containing alcohol	461.40
Containing alcohol	461.45

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

The United States is the leading world producer of cosmetics and toilet preparations, and its domestic market is almost entirely supplied by domestic production. Domestic shipments in 1965 amounted to $2.0 billion, while U.S. imports and exports amounted to approximately 0.1 percent and 1 percent, respectively, of this value.

Description and uses

This summary covers numerous and heterogenous cosmetics and toilet preparations used on or about the skin, mouth, teeth, eyes, nails, and hair. The preparations included are manufactured in the form of dry powders, pastes, solid or liquid emulsions, and as aqueous, alcoholic, or oily solutions. This summary does not, however, cover toilet soaps, perfumes, colognes, and floral waters, which are covered in other summaries (items 466.05-.25 and 461.20, 461.30, and 461.35); nor does it cover preparations intended to cure any disorder of the skin or scalp or to alter the function of the body, which are included under drugs.

The term, cosmetic, as commonly used and as defined in the Federal Food, Drug and Cosmetic Act, 1938 (21 U.S.C. 301 et seq.), refers to "(1) articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into, or otherwise applied to the human body or any part thereof, for cleansing, beautifying, promoting attractiveness, or altering the appearance, and (2) articles intended for use as a component of such articles; except that such term shall not include soap." (Under the Act, adulterated or misbranded cosmetics are prohibited from being imported into the United States). Although a distinction does not generally appear to be made between cosmetics

and toilet preparations, and although the industry sometimes uses the terms synonymously, the trade frequently uses the term cosmetics in referring to non-utilitarian products such as lipstick and rouge, and the term, toilet preparations, in referring to utilitarian products such as shampoos, shaving creams, and deodorants.

Bath salts (items 461.05 and 461.10) are perfumed, usually colored crystals that soften hard water, that is, precipitate calcium salts and prevent the formation of curd of lime (calcium). They are one of the more important of the bath preparations which also include bath oil, talc, and dusting powder. In addition to their water-softening effect, they are used for esthetic purposes. These salts usually are sodium carbonate (sodium carbonate decahydrate or sodium sesquicarbonate), sodium thiosulfate, or borax.

Originally, bay rum was a product obtained by distilling the leaves of the bay tree, Pimenta racemosa, and mixing the distillate with rum, water, and salt; this product, however, is no longer available in the United States. Bay rum, as the term is currently used, is a dilute solution (1 or 2 percent) of bay oil in alcohol and water. It is used as a skin lotion or after-shave lotion and has antiseptic properties as well as a pleasant fragrance. Spice colognes and other lotions have largely replaced it in most uses, however.

Hair preparations now comprise the most important segment, in terms of the value of retail sales, of the cosmetic and toilet preparations industry. Hair sprays and shampoos are the most important products. The basic film-forming ingredient of the bulk of hair sprays is synthetic polyvinylpyrrolidone and its copolymers. The basic ingredients of all shampoos are much the same, but different manufacturers' products may contain special ingredients, or be packaged in different forms.

Deodorants are prepared by incorporating the chemical deodorant agents, usually chlorophenols, in creams, lotions (both clear and emulsified), sticks, powders, gels, aerosols, and soaps. Stick deodorants are alcohol solutions of deodorant chemicals solidified with soap.

Shaving lotions are marketed either as pre-shave or after-shave lotions. Pre-shave lotions are either a composition containing a wetting agent in a base of alcohol, water, and glycerin, perfumed and tinted, or (for use with electric razors) are clear solutions of lubricant materials, such as isopropyl palmitate, isopropyl myristate, and silicones. After-shave lotions consist of a solution of approximately 1 percent perfume, 50 percent by volume of alcohol, and water.

The cosmetics and toilet preparations industry, because of its large size, is an important market for products of the chemical industry. A wide variety of inorganic and organic chemicals and natural products are used as raw materials in the manufacture of the numerous other products included in this summary.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Bath salts:		
461.05	Not perfumed--------	15% ad val.	7.5% ad val.
461.10	Perfumed----------	20% ad val.	10% ad val.
461.15	Bay rum----------	16¢ per lb. + 24% ad val.	8¢ per lb. + 12% ad val.
	Cosmetics and other preparations:		
461.40	Containing alcohol--	15% ad val.	7.5% ad val.
461.45	Not containing alcohol.	16¢ per lb. + 15% ad val.	8¢ per lb. + 7.5% ad val.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption and manufacturers' shipments

U.S. apparent consumption (in terms of dollar value of wholesale shipments) of the cosmetics and toilet preparations covered herein increased steadily by about 100 percent (from about $1 billion to $2 billion) during the period 1958-65, consistent with a well-established trend over the past half century. The domestic market was supplied overwhelmingly by domestic producers; imports generally made up only a fraction of 1 percent of consumption. Exports are small, and thus the value of U.S. shipments is an approximation of the value of U.S. domestic consumption (at wholesale).

The cosmetic and toilet preparations industry has grown rapidly and generally consistently over a long period. Retail sales statistics collected by an industry trade association show that in the years 1941-65 sales of the toilet preparations covered by this summary, which reached about $2.6 billion in 1965, increased in nearly every year; the last decline was in 1947. The upward trend was not even reversed in the recession years. Factors which stimulate the increased demand continue both in the United States and abroad. These include increased population and a longer life span, and higher personal income of this increased population; increased urbanization; higher percentage of women in the working force; and changes in fashion such as new hair styles, social acceptance of increased usage of cosmetics by women, and of increased usage of men's toiletries. A continued Americanization of tastes in various foreign countries adds to this world demand.

In 1965 (table 1), hair preparations comprised the largest category, by value of retail sales, of toiletries marketed in the United States. U.S. consumers spend $868 million, or about 33 percent, of the value of total sales for this group of commodities. Sales of hair spray, given the impetus of aerosol packaging, grew rapidly in recent years and accounted for 27 percent of sales of hair preparations, while shampoo sales amounted to about 25 percent. These two items each accounted for well over $400 million in sales. Rinses, tints, and dyes accounted for over $150 million of the total $868 million. The makeup cosmetics category was next in size; sales amounted to about 19 percent of the total. Lipstick was the largest makeup item, accounting for more than one-third by value of sales in this category and followed closely by face powders. Dentifrices and mouthwashes, the third largest category of toiletries, accounted for about 16 percent of the total. Shaving preparations, personal deodorants, face creams, manicuring preparations, hand lotions, and bath preparations accounted for smaller but significant proportions of the market.

U.S. producers

In 1965 there were about 700 firms which produced the commodities covered by this summary. These firms employed more than 36,000 persons in about 725 establishments. The main producing areas, accounting for about three-fourths of the total output, were, in order of predominance, the Middle Atlantic, East North Central, and Pacific (mainly California) States; but producers are also located in the West North Central States and throughout the South. In 1963, 83 out of 707 establishments each employed 100 or more persons, and accounted for about 88 percent of the total value of shipments of these commodities; it is believed the proportions were similar in 1967. A study by the Bureau of the Census and based on statistics for 1963, showed that in the toilet preparations industry, the following re-

lationships held between size of companies, the percent of value of industry shipments, and percent of all industry employees accounted for by these companies.

	Percent of value of shipments	Percent of all employees
4 largest companies------	38	20
8 largest companies------	52	29
20 largest companies-----	75	52
50 largest companies-----	90	75

U.S. producers operate under conditions of intense domestic competition and frequent market taste changes (particularly in the area of toilet preparations as distinguished from that of cosmetics, as defined above). They expend large budgets on advertising and research and development. Many U.S. firms in this industry are international in character, some are of foreign origin, and own plants in foreign countries. Since World War II, many firms have undergone horizontal, vertical, or conglomerate integration both in the United States and in foreign countries where U.S. brands enjoy prestige reputations. Some of the most important companies in this industry realize a substantial proportion of their earnings (up to 50 percent) from foreign operations.

U.S. exports

The aggregate value of U.S. exports of cosmetics and toilet preparations increased steadily during the period 1958-66 from $14.4 million to $23.8 million, or 65 percent (table 2). In terms of value, however, exports represent only about 1 percent of value of annual industry production (as measured by shipments). Although American-brand cosmetics and toilet preparations enjoy prestige abroad, the relatively low proportion of exports may be in part accounted for by the fact that many U.S. firms, some of which have foreign origins, are international in character and have operated plants in other countries for many years. In 1967, those markets accounting for the largest overall dollar value of exports of cosmetics and toilet preparations from the United States were Canada, Panama, and Hong Kong; however, Canada was the principal market for only three of the eight categories under which exports of cosmetics and toilet preparations are reported (table 3). Domestic cosmetics and other toilet preparations are also exported to numerous other foreign markets in Central and South America, as well as Asia and Europe.

The class of exports described as hair preparations was the largest category in terms of value (table 4). In 1966 (as well as for the previous five years), exports of creams and lotions were second

in importance, having more than doubled since 1961, while those of hair preparations, facial make-up cosmetics (except face powder) and deodorants also have grown, albeit to a lesser extent. Exports of dentifrices diminished by more than 30 percent between 1961 and 1966.

U.S. imports

Imports of cosmetics and toilet preparations (including bath salts and bay rum) are much smaller than exports, and account for only a negligible part (about 0.1 of 1 percent) of domestic consumption (table 2). In terms of value, France has supplied the greatest proportion of these small imports in recent years (table 5). The proportion supplied by France has declined irregularly from 49 percent in 1961 to 39 percent in 1967. Smaller but significant proportions have been supplied by other Western European nations, Japan, and (in 1967) Canada.

Imports of bath salts are small compared to total imports of all cosmetics and toilet preparations, and are given in table 6. The United Kingdom has been the principal source, and West Germany a secondary source. Bay rum has probably not been imported into the United States in recent years. Reported imports, which are very small, probably consist of bay oil misclassified; the duty on bay oil is low, while the duty on bay rum is almost prohibitive; however, substantial quantities of bay rum are shipped from the Virgin Islands from which they enter the United States duty free. Statistics on imports of individual cosmetics and toilet preparations other than bath salts and bay rum are not available; combined statistics on products other than bath salts and bay rum are given in table 7.

World production and trade

The bulk of the world production of cosmetics and toilet preparations (including perfumery covered elsewhere) whose value amounted to in excess of $3.7 billion in 1965 is carried on in the industrialized and developed countries. For the year 1965, ranging next to the United States in dollar value of output (including perfumery, covered elsewhere) were France ($397 million), Japan ($347 million), West Germany ($314.5 million), and the United Kingdom ($256.0 million). It is believed that in 1965 three-fourths of the total value of the West German output, or $236 million, was cosmetics and toilet preparations excluding perfumes and colognes. The value of manufacturers' shipments of cosmetics and toilet preparations, excluding perfumery, amounted to $78 million in Canada, in 1964. Separate statistics on production of cosmetics and toilet preparations, excluding perfumes and colognes, for the other major world producers are not available; however, the proportion of perfumery in the totals above is believed to vary between one-tenth and one-fourth of total

value. In the United States in 1963, shipments of perfumes and colognes were valued at 10.3 percent of the total which included cosmetics, toilet preparations, and perfumes. Of the major world producers, the rate of growth between 1964 and 1965 was greatest in West Germany; the value of production rose here by 22 percent, compared to 12 percent for Japan in the comparable period.

Industry sources have estimated world consumption of cosmetics and toilet preparations in terms of retail sales outside the United States during 1965 as exceeding $1.8 billion; Europe accounted for $800 million of this (England, France, Germany, and Italy together, with the rest of Europe, each $200 million). While the Latin American and Asian aggregates of countries each spent $350 million, the Canadian Government and a Canadian trade association reported that for 1965, sales of cosmetics and toilet preparations in Canada, excluding colognes and toilet waters, perfumes, sachets, and other fragrance preparations, amounted to a value of about $243 million.

In 1965, the United Kingdom exported $31.8 million of cosmetics and toilet preparations and thus led the industrial countries in supplying foreign markets with these commodities. For that year separate statistics on countries exported to are as yet not available; however, for the year 1963, West Germany and Asian markets absorbed the greatest shares of exports from the United Kingdom. France, in 1965, shipped to world markets cosmetics and toilet preparations (other than perfumes), valued at $22.6 million. West Germany and Italy were France's largest foreign markets, having absorbed these commodities valued at $3.4 million and $2.4 million, respectively. West Germany exported, during the year 1965, cosmetics and toilet preparations valued at $16.6 million, about $7.8 million of which was absorbed within the EEC countries.

Table 1.--Cosmetics and toilet preparations: U.S. retail sales, by product and product category, 1965

Product and product category	Total and sectors	
	Value	Percent of total
	1,000 dollars	
Grand total	2,621,970	100.0
Hair preparations, total	868,310	33.1
Hair spray	239,000	9.1
Shampoos	220,090	8.4
Rinses, tints, dyes	154,390	5.9
Hair tonic, men's	87,060	3.3
Other	167,770	6.4
Make-up cosmetics, total	498,380	19.0
Lipsticks	182,060	7.0
Make-up bases, powders, pressed and loose (face and body)	170,640	6.5
Compact and powder puffs	71,980	2.7
Mascara, other eye makeup	35,240	1.3
Face lotion and astringent	29,200	1.1
Rouge	9,260	.4
Dentifrices, mouthwashes, and related products	421,970	16.1
Shaving preparations, including men's packaged toilet sets	234,120	8.9
Cleansing, foundation, facial creams	191,360	7.3
Personal deodorants	145,900	5.6
Manicuring preparations	71,140	2.7
Hand lotions and creams	60,780	2.3
Bath salts, tablets, oils	33,510	1.3
Other	96,500	3.7

Source: Compiled from statistics published in Drug Topics Annual Survey of Toilet Goods Sales.

Table 2.--Cosmetics and toilet preparations: U.S. shipments, imports for consumption, exports of domestic merchandise, and apparent consumption, 1958-67

(Value in thousands of dollars)

Year	U.S. shipments	Imports	Exports	Apparent consumption	Ratio of imports to consumption	Ratio of exports to U.S. shipments
					Percent	Percent
1958	1,022,582	735	14,446	1,008,871	0.07	1.4
1959	1,136,460	666	15,691	1,121,435	.06	1.4
1960	1,211,195	1,175	15,762	1,196,608	.10	1.3
1961	1,314,045	1,549	15,911	1,299,683	.12	1.2
1962	1,426,511	1,878	16,987	1,411,402	.13	1.2
1963	1,649,969	1,808	17,096	1,634,681	.11	1.0
1964	1,847,766	2,445	18,801	1,831,409	.13	1.0
1965	2,031,276	2,609	21,730	2,012,155	.13	1.1
1966	1/	3,198	23,833	1/	1/	1/
1967	1/	3,766	23,605	1/	1/	1/

1/ Not available.

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

Table 3.--Cosmetics and toilet preparations: U.S. exports of domestic merchandise, total and principal markets, by type, 1967

(Value in thousands of dollars)

Type	Total	Percent of total	Principal markets		
			First	Second	Third
Hair preparations	5,104	21.6	Canada, 683.	Hong Kong, 416.	Panama, 368.
Creams, lotions, and balms	4,600	19.5	Japan, 704.	Canada, 496.	Belgium, 412.
Rouges, lipsticks, and eye makeup	3,833	16.2	Canada, 1,018.	Hong Kong, 244.	West Germany, 233.
Deodorants, depilatories, and manicuring preparations	2,200	9.3	Panama, 375.	West Germany, 266.	Venezuela, 172.
Dental creams, tooth pastes, and dental preparations	1,665	7.1	Netherlands Antilles, 202.	Hong Kong, 170.	Surinam, 156.
Shaving preparations	654	2.8	Sweden, 103.	Canada, 82.	Panama, 52.
Mouthwashes	520	2.2	Netherlands Antilles, 64.	Canada, 61.	Switzerland, 56.
All other	5,029	21.3	Canada, 940.	Panama, 388.	United Kingdom. 298.
Total	23,605	100.0	Canada, 3,460.	Panama, 1,450	Hong Kong, 1,429

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

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Table 4.--Cosmetics and toilet preparations: U.S. exports of domestic merchandise, by type, 1961-67

(Value in thousands of dollars)

Type	1961	1962	1963	1964	1965	1966	1967
Hair preparations	3,339	4,043	4,314	4,556	4,901	4,602	5,104
Creams, lotions, and balms	1,871	2,016	2,317	3,208	3,532	4,192	4,600
Rouges, lipsticks, and eye makeup	2,487	2,576	2,863	2,949	3,707	4,175	3,833
Deodorants, depilatories, and manicuring preparations	1,859	1,628	1,497	1,810	2,644	2,721	2,200
Dental creams, tooth pastes, and dental preparations	2,200	2,180	1,630	1,414	1,433	1,523	1,665
Shaving preparations	1/	1/	1/	1/	1,098	953	654
Face powder (all forms) and talcum powder, in packages	1,396	1,286	1,140	1,068	1/	1/	1/
Mouthwashes	2/	2/	2/	2/	370	471	520
All other	2,759	3,258	3,335	3,797	4,045	5,196	5,029
Total	15,911	16,987	17,096	18,802	21,730	23,833	23,605

1/ Included in "All other."

2/ Non-medicinal mouthwashes included in "Dental creams, toothpastes, and dental preparations".

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

Table 5.--Cosmetics and toilet preparations: U.S. imports for consumption, by principal sources, 1961-67

(Value in thousands of dollars)

Source	1961	1962	1963	1964	1965	1966	1967
France	736	752	818	1,085	825	1,037	1,468
West Germany	101	328	171	194	260	388	550
United Kingdom	95	90	157	223	234	514	378
Japan	82	79	126	158	144	254	359
Sweden	203	284	208	274	379	314	237
Italy	66	58	47	138	300	189	221
Spain	153	132	133	118	178	185	210
Canada	53	5	7	3	9	64	202
Switzerland	46	111	63	117	117	176	70
All other	14	39	78	135	163	77	71
Total	1,549	1,878	1,808	2,445	2,609	3,198	3,766

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

Table 6.--Bath salts: U.S. imports for consumption, by principal sources, 1961-67

Source	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
United Kingdom	41	54	132	202	133	78	45
West Germany	22	21	24	31	26	40	39
Italy	2	5	8	5	11	9	6
Japan	7	5	11	6	8	3	10
France	1	8	1	2	1	-	2
All other	4	2	3	3	-	5	-
Total	77	95	179	249	179	135	102
	Value (1,000 dollars)						
United Kingdom	25	22	55	64	41	37	17
West Germany	6	9	6	9	7	12	12
Italy	1	2	3	2	5	3	2
Japan	4	2	5	3	3	2	4
France	1	4	1	2	1	-	1
All other	3	-	4	1	1	1	-
Total	40	39	74	81	58	55	36

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

Table 7.--Cosmetics and toilet preparations, other 1/: U.S. imports for consumption, by principal sources, 1961-67

(Value in thousands of dollars)

Source	1961	1962	1963	1964	1965	1966	1967
France	735	747	817	1,081	824	1,034	1,467
West Germany	95	320	165	184	253	376	536
United Kingdom	70	68	102	159	192	476	359
Japan	78	77	121	156	141	252	355
Sweden	203	284	208	274	379	314	237
Italy	65	56	44	137	295	174	219
Spain	153	132	133	118	178	185	210
Canada	50	5	7	3	9	63	202
Switzerland	45	111	60	116	117	175	70
All other	15	39	76	123	161	77	67
Total	1,509	1,839	1,733	2,351	2,549	3,126	3,722

1/ Does not include bath salts or bay rum.

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

Commodity	TSUS item
Floral or flower waters	461.20
Perfumes, colognes, and toilet waters:	
Not containing alcohol	461.30
Containing alcohol	461.35

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

All but about 5 percent of U.S. consumption of the fragrances covered herein is customarily met by domestic production. The value of domestic manufacturers' shipments (including interplant transfers) amounted to $171 million in 1963. Retail sales in 1965 of these commodities was estimated by the industry to have been valued at $200 million. The value of U.S. imports and exports was small when compared to shipments and retail sales, amounting to $8 million and $2.2 million, respectively, in 1967.

Description and uses

In general, a perfume is any substance that emits an agreeable odor. Commercially, the term usually refers to a concentrated blend of certain odoriferous ingredients (perfume oils) in alcohol. However, a limited amount of non-alcoholic water-emulsion and oil-based perfumes is marketed, as well as a small quantity of solid perfumes in stick form and of so-called "dry perfumes" such as sachets and pastilles. A recent development is the packaging of fragrances in aerosol containers.

Toilet waters are similar to the alcoholic perfumes described above, but are less concentrated; they contain a smaller proportion of the aromatic principle and a lower proof alcohol. The term, cologne, is, in the United States, generally a synonym for toilet water; in Europe, however, the corresponding term, eau de cologne, denotes a toilet water containing, in addition to other ingredients, certain citrus oils--bergamot, lemon, orange, and neroli (orange flower).

Flower (floral) waters are either by-products of the extraction of essential oils (items 452.02-452.80) from flowers by steam distillation, or similar artifically-made products. By-product flower waters are the aqueous liquors remaining after the essential oil is separated

from the distillate. Artificial, or synthetic, flower waters are made by adding small amounts of essential oils to distilled water. The best known of the flower waters are rose water and orange flower water.

Perfumes are complex mixtures often containing 30 or more ingredients, many of which themselves have several constituents; thus a perfume may be composed of more than 100 chemical compounds. The ingredients of a perfume may be grouped into several categories, each of which makes a specific contribution to the finished product. Perfumes are blends of (1) essential oils obtained from various plant parts (items 452.02-452.80); (2) other floral essences, concretes and related flower extracts obtained by various means (item 460.05); (3) isolates, i.e., chemical compounds, such as terpenes, which have been isolated from essential oils (460.15, 460.25, 460.35-460.55, and 460.65-460.90); (4) benzenoid chemicals (items 408.05-408.60) and other synthetic chemicals which may or may not occur naturally; (5) fixatives of animal origin (items 460.10, 460.20, 460.30, and 460.60); and (6) resinoids, balsams (items 188.18-188.24), and similar fixatives of vegetable origin. The ingredients of a perfume can be purchased individually from essential oil houses and blended by the producers. It is more customary, however, for the producer to base his perfume on one or more of the so-called "aromatic specialties", which are prepared blends of certain of the ingredients sold by essential oil dealers.

Perfumes, toilet waters, and flower waters may be applied directly to the person or the clothing to refresh and impart an aura of fragrance to the wearer. Perfumes are also used to impart a pleasant odor, or counteract a disagreeable one, in soaps, cosmetics, rubber and plastic articles for household use or personal wear, paint, industrial packaging, food, and the air in industrial plants.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
461.20	Flower waters----------	5% ad val.	2.5% ad val. 1/
	Perfumes and toilet waters:		
461.30	Not containing alcohol--	15% ad val.	7.5% ad val.
461.35	Containing alcohol------	16¢ per lb. + 15% ad val.	8¢ per lb. + 7.5% ad val.

1/ This rate, as well as those for 1970 and 1971, is contingent; see footnote 1 to Staged Rates and Historical Notes to Pt. 7 of schedule 4 of the TSUSA-1968, as shown in appendix A to this volume.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS) through the end of 1967.

In addition to the import duty, perfume containing alcohol is subject to an Internal Revenue tax of $10.50 per wine gallon (26 U.S.C. 5001).

U.S. consumption

Based on official statistics, consumption of perfume, colognes and toilet waters in the United States more than doubled between 1958 and 1963 and amounted to $175 million in the latter year (table 1); more recent official data are not available. Based on industry statistics, consumption of the domestic output of these products rose consistently and steadily during the period 1960-65, from about $130 million at the beginning of the period to $200 million in 1965 (table 2). Toilet water and cologne accounted for between 70 and 75 percent of the total during this period, and amounted to $148 million in 1965. Sales of perfume accounted for about one-fourth of the total, or $51 million in 1965 (table 2). A large factor in the overall and consistent annual increase in consumption of these commodities is the significant rise in the popularity of men's cosmetics and colognes. In addition, factors such as increased popularity, higher earnings, and urbanization, which have resulted in an increased consumption of cosmetics and toilet preparations, have also stimulated the growing consumption of perfumery.

The proportion of consumption supplied by imports probably has not exceeded about 5 percent in recent years. Domestic consumption of imported perfume probably consists largely of French perfumes which compete on the basis of prestige rather than price. Perfumes are imported into the United States in finished and packaged form, while most colognes and toilet waters are usually formulated and/or bottled in this country using fragrance materials in bulk which are imported from France.

A significant segment of U.S. consumption of perfumes and related products is believed to be supplied by the largest U.S. producer of fragrances, which markets its products by door-to-door operation and whose sales are believed to exceed those of any other producer, foreign or domestic.

U.S. producers

There are about 85 domestic producers of perfumes, colognes, and toilet waters, who are situated principally in the Middle Atlantic (New York, New Jersey, Pennsylvania) area. Many of them are subsidiaries or affiliates of French companies, and import perfume materials and concentrates for further processing and formulation in the United States. The final products of the producers who are associated with French companies are considered by the public to be "imported" perfumes; they carry more prestige and generally command a higher price than perfumes made by producers who fully compound their perfume domestically, primarily from domestic raw materials. Producers who are affiliated with French companies usually restrict their output to perfumes, colognes, and toilet waters; the producers who start chiefly from domestic materials generally also manufacture related products such as cosmetics, toilet preparations, and soap.

There is no production of natural flower waters in the United States.

U.S. shipments

Based on official statistics, U.S. manufacturers' shipments, including interplant transfers, of perfumes, colognes, and toilet waters were valued at $171 million in 1963, more than twice the value of shipments in 1958 (table 1). The largest component, amounting to $108 million, consisted of toilet waters and colognes; this value was double that for 1958 and is the most popular form of fragrance in the United States; however, the more than threefold increase in value of output (from $18 million to $59 million) of the higher priced perfumes, liquid and solid, was greater than that for colognes, etc., between 1958-63.

Based on industry statistics, retail sales of perfumes, colognes, and toilet waters by domestic manufacturers increased from $131 million in 1960 to $199 million in 1965. Sales of perfumes increased during this period from $37 million in 1960 to $51 million in 1965, or about 40 percent; corresponding sales of colognes and toilet waters increased from $94 million to $148 million, or more than 50 percent.

U.S. exports

U.S. exports, which more than doubled in value, from $904,000 to $2.2 million, in the interval 1958-67 (table 3) nevertheless amounted to an insignificant percentage (generally less than 1 percent) of the value of U.S. shipments. The value of U.S. exports of perfumes, colognes, and toilet waters have traditionally been small in relation to production or shipments and imports.

In 1967, the United States exported perfumes, colognes, and toilet waters to about 75 countries. Although the largest markets (amounting to more than $100,000 in value) were Canada, the Nan Islands, the United Kingdom, and Panama, Australia, and Mexico, there were numerous markets in other countries of Latin America, and Asia, as well as in Africa. While the value of U.S. exports in recent years has fluctuated without trend in the Canadian, Mexican, and West German markets, they have generally risen in the markets of Australia, the United Kingdom, Panama, Northern Antilles, and Japan.

Since there is no known domestic production of floral or flower waters, there are no exports.

U.S. imports

The value of U.S. imports of perfumes, colognes, and toilet waters rose by an overall 140 percent during the period 1958-67, from $3.5 million at the beginning of the period to $8.5 million in 1967. In no year, however, were imports equivalent to as much as 5 percent of domestic production. France dominated the market for these products, and in 1967 supplied imports valued at $7.2 million, or 85 percent of total imports of $8.5 million (table 4). Spain, West Germany, Bermuda, the United Kingdom, and Italy were other significant sources.

After increasing to a peak of 2.3 million pounds, valued at $9.7 million, in 1965, imports dropped sharply in quantity and appreciably in value, to 1.1 million pounds, valued at $9.1 million, in 1966. Imports in 1967 were slightly lower than in 1966.

Perfumes, colognes, and toilet waters containing alcohol accounts for nearly all of the imports of products covered by this summary. In 1967, they amounted to $8.3 million, or more than 99 percent of all products covered.

Imported perfumes compete in the domestic market with the highest quality domestic perfumes, but generally commands a higher price because of its prestige value.

Foreign consumption and exports

Separate statistics on world consumption of perfumes, etc., are not available; however, according to industry estimates, retail sales in the overall cosmetics and toilet articles industry including perfumery in international markets (including Canada) was less than that for the United States, i.e., approximately $1.85 billion internationally as compared to $2.89 billion for the United States in 1965. It is

assumed that the estimated relative figures for expenditures for perfumes, colognes, etc., in the international U.S. markets are similarly proportional. According to industry sources, England, France, West Germany, and Canada are the largest foreign markets, and these were each estimated for 1965 at approximately $200 million in retail sales for all cosmetics, toiletry products, including fragrances, and it is assumed that sales of fragrances alone are proportionately similarly valued in these respective countries.

In terms of exports, the leader on the world market was France who exported perfumery valued at $3.3 million in 1965 to over 100 markets in all continents throughout the world. Her largest markets were the United States (about $10 million), West Germany (about $4.4 million), and the United Kingdom (about $3 million). The differences in values obtained for French perfumery exports to the United States between those found in French and U.S. statistics may be accounted for by differences in time of recording year-end shipments and, to a small extent, the exclusion of low-valued imports from separate U.S. statistics for these items. In 1965, the United Kingdom exported perfumery valued at approximately $1.7 million. Separate export statistics on West German exports of perfumery are not available; however, the value of West German production of fragrances, which amounted to $65.8 million in 1964, accounted for approximately one-fourth the value of the total of production of toiletries, cosmetics, and perfumery in West Germany. In 1965, the value of exports of the total of these groups amounted to about $16.6 million. It is estimated that approximately one-fourth of these exports comprised fragrances. The largest markets for these exports from West Germany are in the EEC and other countries of Europe (the United Kingdom, Switzerland, and Austria).

Table 1.--Perfumes, toilet waters and floral waters: U.S. shipments, imports for consumption, and exports of domestic merchandise, 1958-67

(Value in thousands of dollars)

Year	U.S. shipments 1/	Imports	Exports	Apparent consumption
1958	65,385	3,472	904	67,953
1959	2/	3,979	1,248	2/
1960	2/	5,389	1,935	2/
1961	2/	5,905	1,562	2/
1962	2/	5,603	1,365	2/
1963	170,553	5,843	1,215	175,181
1964	2/	8,351	1,372	2/
1965	2/	9,721	1,418	2/
1966	2/	9,095	1,921	2/
1967	2/	8,491	2,151	2/

1/ Including interplant transfers.
2/ Not available.

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

Note.--The ratio of imports to consumption was 5.1 percent in 1958; the ratio of exports to U.S. shipments was 1.4 percent in 1958. The ratio of imports to consumption was 3.3 percent in 1963; the ratio of exports to U.S. shipments was 0.7 percent in 1963.

Table 12.--Perfumes, toilet waters and floral waters: U.S. sales at retail, by type of product, 1960-65

(Value in thousands of dollars)

Year	Perfumes		Toilet waters and cologne		Total
	Value	Percent of total	Value	Percent of total	
1960	36,920	28.2	93,670	71.7	130,590
1961	37,440	26.5	103,770	73.5	141,210
1962	40,580	26.3	113,750	73.7	154,330
1963	43,040	25.9	123,200	74.1	166,240
1964	47,200	26.0	134,370	74.0	181,570
1965	51,370	25.8	147,880	74.2	199,250

Source: Drug Topics, Annual Survey of Toilet Sales.

Table 3.--Perfumes, toilet waters and floral waters: U.S. exports of domestic merchandise, by principal markets, 1958 and 1962-67

Market	1958	1962	1963	1964	1965	1966	1967
	Value (1,000 dollars)						
Canada	183	141	230	157	225	179	207
Nan Islands	5	25	34	22	42	66	179
United Kingdom	1	44	33	106	84	154	169
Panama	41	54	75	116	140	135	160
Australia	5	11	25	57	47	170	102
Mexico	31	84	90	109	48	95	102
Hong Kong	8	26	25	30	44	74	90
N. Antilles	59	46	64	93	78	102	81
Japan	2	34	25	58	49	84	61
Bahamas	-	6	13	43	32	52	44
Colombia	8	35	46	44	-	60	38
West Germany	11	86	21	48	85	82	36
All other	550	773	534	489	544	668	882
Total	904	1,365	1,215	1,372	1,418	1,921	2,151

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

Table 4.--Perfumes, toilet waters and floral waters: U.S. imports for consumption, by principal sources, 1958 and 1962-67

Source	1958	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds) 1/						
France	207	680	641	1,867	1,817	722	763
Spain	30	88	118	175	179	140	129
West Germany	42	71	61	96	117	107	87
Bermuda	-	5	12	18	40	55	29
United Kingdom	16	30	70	16	78	25	33
Italy	2	8	6	13	28	21	13
All other	39	24	44	34	34	39	31
Total	336	906	952	2,219	2,293	1,109	1,085
	Value (1,000 dollars)						
France	3,058	4,844	5,005	7,245	8,350	7,666	7,208
Spain	151	284	288	431	456	498	476
West Germany	161	313	307	448	539	495	434
Bermuda	-	24	51	67	146	195	120
United Kingdom	43	81	114	46	73	70	104
Italy	13	27	41	52	65	75	59
All other	46	30	37	62	92	96	90
Total	3,472	5,603	5,843	8,351	9,721	9,095	8,491

1/ Imports of flower waters converted from gallons by assuming 1 gallon equals 8 pounds.

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

(Except fatty acid salts and lignin sulfonates)

Commodity	TSUS item
Fatty substances of animal (including marine animal) or vegetable origin:	
Not sulfonated or sulfated:	
Fatty-acid esters, ethers, and ether-esters of polyhydric alcohols:	
Derived from coconut, palm-kernel, or palm oil	465.05
Other	465.10
Fatty-acid amides, amines, and quaternary ammonium salts:	
Derived from coconut, palm-kernal, or palm oil	465.15
Other	465.20
Sulfonated or sulfated:	
Fatty acids and salts of fatty acids:	
Derived from coconut, palm-kernel, or palm oil	465.35
Other	465.40
Fatty alcohols and salts of fatty alcohols:	
Derived from coconut, palm-kernel, or palm oil	465.45
Other	465.50
Fatty-acid esters, ethers, amides, and amines:	
Derived from coconut, palm-kernel, or palm oil	465.55
Other	465.60
Fats, oils, and greases, all the foregoing sulfonated or sulfated:	
Coconut, palm-kernel, and palm oils	465.65
Tallow	465.70
Wool grease	465.75
Other:	
Animal (including marine animal)	465.80
Vegetable	465.85
Carboxymethyl cellulose salts	465.87
Dibasic-acid esters, ethers, amides and amines, all the foregoing sulfonated or sulfated	465.90
Surface-active agents (except surface-active agents described elsewhere in this part)	465.95
Products chiefly used as assistants in preparing or finishing textiles, n.s.p.f.	493.50

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A of this volume).

U.S. trade position

U.S. consumption of nonbenzenoid surface-active agents and textile assistants (except fatty acid salts and lignin sulfonates) has amounted to more than $300 million annually in recent years and has been supplied almost entirely by domestic production. Imports supply less than 2 percent of consumption, while exports amount to four times the value of imports.

Description and uses

Surface-active agents are organic compounds which lower the surface tension of water or other solvents and are used as detergents, dispersing agents, emulsifiers, foaming agents, or wetting agents. They are used principally as active ingredients in formulated detergents for household or industrial use. They are also used in the processing of textiles and leather, in ore flotation and oil-drilling operations, and in the manufacture of agricultural sprays, concrete, cosmetics, elastomers, foods, lubricants, paints, pharmaceuticals, plastics, wallboard, and many other products.

Textile assistants are chemical compounds and mixtures used in preparing or finishing textiles. They include a wide variety of products used as antistatic agents, detergents, dyeing and printing assistants, flame-retarding chemicals, leveling agents, lubricants, sizing agents, softeners, wash-and-wear resins, water-repellent finishes, wetting agents, etc. Most surface-active agents can be used as textile assistants but even when so used are classifiable as surface-active agents. TSUS item 493.50 provides for only those nonbenzenoid textile assistants not more specially provided for elsewhere in the TSUS.

The nonbenzenoid surface-active agents and textile assistants which are covered by this summary are made from petroleum, from natural fats and oils, from silvichemicals, and from other sources such as locust bean gum. They include a very large number of individual products falling into a number of chemical classes, some of which are specifically provided for in the TSUS, e.g., fatty amides, amines, and quaternary ammonium salts, sulfated fatty alcohols, and sulfated fats and oils. They range in price from 10 - 15 cents per pound for a few products such as mixed linear alcohol ethoxylate, sulfated mixed linear alcohol ethoxylate, and sulfated tallow up to several dollars per pound for a few specialty products. Benzenoid surface-active agents, item 405.35; benzenoid textile assistants, item 405.30; sodium and potassium salts of fatty acids, items 465.25 and 465.30; lignin sulfonates, item 465.92; and synthetic detergents, item 466.30, are discussed in other summaries.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the Tariff Schedules of the United States Annotated) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Fatty substances of animal (including marine animal) or vegetable origin:		
	Not sulfonated or sulfated:		
	Fatty-acid esters, ethers, and ether-esters of polyhydric alcohols:		
465.05	Derived from coconut, palm-kernel, or palm oil	3¢ per lb. + 15% ad val.	1.5¢ per lb. + 7.5% ad val.
465.10	Other	3.75¢ per lb. + 15% ad val.	1.8¢ per lb. + 7.5% ad val.
	Fatty-acid amides, amines, and quaternary ammonium salts:		
465.15	Derived from coconut, palm-kernel, or palm oil	3¢ per lb. + 15% ad val.	1.5¢ per lb. + 7.5% ad val.
465.20	Other	3.75¢ per lb. + 15% ad val.	1.8¢ per lb. + 7.5% ad val.
	Sulfonated or sulfated:		
	Fatty acids and salts of fatty acids:		
465.35	Derived from coconut, palm-kernel, or palm oil	10% ad val.	5% ad val.
465.40	Other	1.5¢ per lb. + 10% ad val.	0.7¢ per lb. + 5% ad val.
	Fatty alcohols and salts of fatty alcohols:		
465.45	Derived from coconut, palm-kernel, or palm oil	10% ad val.	5% ad val.
465.50	Other	1.5¢ per lb. + 10% ad val.	0.7¢ per lb. + 5% ad val.

U.S. tariff treatment--Con.

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Fatty substances of animal (including marine animal) or vegetable origin:		
	Sulfonated or sulfated:		
	Fatty-acid esters, ethers, amides, and amines:		
465.55	Derived from coconut, palm-kernel, or palm oil	10.5% ad val.	5% ad val.
465.60	Other	0.75¢ per lb. + 10.5% ad val.	0.3¢ per lb. + 5% ad val.
	Fats, oils, and greases, all the foregoing sulfonated or sulfated:		
465.65	Coconut, palm-kernel, and palm oils	14% ad val.	7% ad val.
465.70	Tallow	0.75¢ per lb. + 14% ad val.	0.3¢ per lb. + 7% ad val.
465.75	Wool grease	2¢ per lb. + 14% ad val.	1¢ per lb. + 7% ad val.
	Other:		
465.80	Animal (including marine animal)	1.5¢ per lb. + 14% ad val.	0.7¢ per lb. + 7% ad val.
465.85	Vegetable	14% ad val.	7% ad val.
465.87	Carboxymethyl cellulose salts	16¢ per lb.	8¢ per lb.
465.90	Dibasic-acid esters, ethers, amides and amines, all the foregoing sulfonated or sulfated	10.5% ad val.	5% ad val.
465.95	Surface-active agents (except surface-active agents described elsewhere in this part)	10.5% ad val.	5% ad val.
493.50	Products chiefly used as assistants in preparing or finishing textiles, not specially provided for	12.5% ad val.	6% ad val.

The rates effective January 1, 1972, reflect the final stage of the reductions negotiated under the General Agreement on Tariffs and Trade (GATT) in the Kennedy Round. The first of five annual stages of these reductions became operative January 1, 1968. Rates of duty for each of the individual stages are given in the Tariff Schedules

of the United States Annotated (1968), an excerpt from which is reproduced as appendix A to this volume. Item 465.87, carboxymethyl cellulose salts, was added to the TSUS on December 7, 1965 pursuant to Public Law 89-241; at the same time, item 429.80, which had previously been inserted for this product but which had proved to be an ineffective provision, was eliminated. From August 31, 1963 to December 6, 1965, imports of carboxymethyl cellulose salts were classified under various more specific "basket" provisions of the TSUS.

The following tabulation shows the ad valorem equivalent of the duty (AVE), based on 1967 imports (except where otherwise noted), for each of the TSUS classes covered by this summary.

TSUS item	AVE (percent)	TSUS item	AVE (percent)	TSUS item	AVE (percent)
465.05	24.2	465.50	13.8	465.80	19.3
465.10	22.7	465.55	10.5	465.85	14.0
465.15	23.9	465.60	12.8	465.87	15.7
465.20	20.0	465.65	14.0 1/	465.90	10.5
465.35	10.0	465.70	25.5 2/	465.95	10.5
465.40	22.2	465.75	17.1 1/	493.50	12.5
465.45	10.0				

The average ad valorem equivalent for all of these TSUS classes for which there were imports was 12.8 percent for 1967 and 12.4 percent for 1966.

U.S. consumption

Total U.S. consumption of the nonbenzenoid surface-active agents and textile assistants covered by this summary is estimated at approximately $260 million in 1964, $315 million in 1965, and $360 million in 1966. Consumption of these products, which are generally competitive with similar materials of benzenoid origin, as well as with soaps and lignin sulfonates, has been increasing at a much faster rate than population because of the continuing development of new products and new applications. Except for the sulfated oils and a few similar products, these chemicals either did not exist or were of little economic importance before World War II. Since then, synthetic detergents have almost completely replaced soap for laundry and general cleaning purposes, and a multitude of industrial uses for surface-active agents has been developed. Of increasing importance in recent years has been the trend toward production of nonbenzenoid surface-active agents from petroleum-derived intermediates

1/ Based on 1966 imports. There were no imports in 1967.
2/ Based on the unit value of domestic sales in 1966. There have been no imports since the effective date of the TSUS.

rather than from the natural fats and oils which were formerly used almost exclusively. Also of great importance for the industry is the search for products which are readily biodegradable and thus do not contribute to water pollution. This has already led to a switch from the (benzenoid) sulfated alkylphenol ethoxylate to the (nonbenzenoid) sulfated linear alcohol ethoxylate; and in the opinion of competent observers it may ultimately lead to the replacement of the (benzenoid) linear alkylbenzenesulfonate, which is the workhorse of the industry, by the (nonbenzenoid) linear alcohol sulfate.

U.S. production

The value of U.S. production of the surface-active agents covered by this summary has steadily increased from $163 million in 1961 to $293 million in 1966 (table 1). Data for production of nonbenzenoid textile assistants are not available, but the value of production is estimated at approximately $40-60 million annually during the same years. 1/ Thus total U.S. production of these products has increased from $200 million in 1961 to $350 million in 1966.

There are at least several hundred U.S. producers of the chemical compounds and mixtures covered by this summary. Most of the producers are located in the Northeastern and Midwestern states, although some are located in the Southeastern states, along the Gulf Coast, and in California. The producers include a number of large integrated concerns which manufacture a variety of other products, such as chemicals, meat products, petroleum, pharmaceuticals, and soaps; they also include many medium-sized and small firms which specialize in surface-active agents or textile chemicals.

U.S. imports and exports

The value of U.S. imports of nonbenzenoid surface-active agents and textile assistants increased from $2.5 million in 1964 to $4.8 million in 1966, and then declined to $4.4 million in 1967. Canada has been the most important source of imports, accounting for more than half the total quantity in each of the years 1964-67. Other important sources of supply have been Switzerland, West Germany, the United Kingdom, the Netherlands, and Japan (table 2).

1/ Preliminary results of a recent non-government survey indicate that domestic sales of textile resins and finishes in 1968 amounted to $300 million. This figure includes both benzenoid and nonbenzenoid products, but apparently excludes textile processing chemicals. Most of the products included in this survey are plastics materials which would presumably not be classified as textile assistants for tariff purposes.

Exports of these products are not separately classified in the official statistics. It is estimated, however, that the value of exports increased from about $10-12 million in 1961 to about $15-17 million in 1966.

Table 1.--Nonbenzenoid surface-active agents (except fatty acid salts and lignin sulfonates): U.S. production, 1961-66

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

Year	Quantity	Value 1/
1961	566,893	163,265
1962	635,049	183,529
1963	658,060	192,154
1964 2/	757,072	215,008
1965 3/	900,797	274,743
1966 3/	991,955	292,627

1/ Estimated from unit value of sales.
2/ Partially estimated.
3/ Includes 24-32 million pounds of primary fatty monoamines, valued at $7-10 million, which was not included in earlier years.

Source: U.S. Tariff Commission, Synthetic Organic Chemicals, U.S. Production and Sales.

Table 2.--Nonbenzenoid surface-active agents and textile assistants (except fatty acid salts and lignin sulfonates): U.S. imports, by principal sources, 1964-67

Source	1964 1/	1965 1/	1966	1967
	Quantity (1,000 pounds)			
Canada	5,894	12,016	13,118	9,436
Switzerland	2,192	1,741	2,669	1,849
West Germany	934	1,175	3,298	2,574
United Kingdom	1,390	1,463	1,592	1,887
Netherlands	205	883	733	581
Japan	58	322	836	842
All other	790	774	1,197	1,690
Total	11,463	18,374	23,443	18,859
	Value (1,000 dollars)			
Canada	531	1,211	1,381	1,158
Switzerland	1,077	761	1,252	877
West Germany	304	355	785	824
United Kingdom	295	317	485	604
Netherlands	59	303	259	251
Japan	22	81	263	164
All other	255	221	374	567
Total	2,543	3,249	4,799	4,445

1/ Includes some lignin sulfonates, which were not reported separately until Dec. 7, 1965.

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

Commodity	TSUS item
Lignin sulfonic acid and its salts-------	465.92

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

U.S. consumption of lignin sulfonates is of the same magnitude as production, amounting to more than 400 million pounds annually. The quantity of imports amounts to about six percent of domestic production and closely approximates the quantity of exports. The value of exports, however, is more than four times the value of imports, and the United States had a favorable trade balance of $3.4 million in 1966 and $2.6 million in 1967.

Description and uses

Lignin sulfonic acid and its salts are surface-active agents of varying molecular weight obtained as a byproduct of the sulfite pulping process used in the paper industry. Lignin, a complex polymer consisting predominantly of phenylpropane units, is one of the most abundant of all naturally occurring organic substances. It accounts for up to 40 percent of the dry weight of wood, in which it acts as a binder which holds together the cellulose fibers and contributes materially to the strength and mechanical properties of the wood. In the sulfite pulping process, wood chips are digested in sulfurous acid containing a bisulfite salt (usually the calcium salt). Digestion converts the insoluble lignin to the water-soluble calcium lignin sulfonate and thus separates it from the unchanged and undissolved cellulose. Disposal of the spent sulfite liquors which remain after the insoluble cellulose fibers have been removed has been a continuing problem for the industry. These liquors, which contain principally calcium lignin sulfonate and wood sugars, are discharged into streams (increasingly public opinion and federal and state laws operate to restrict this kind of environmental pollution), are disposed of by lagooning or by soil filtration, or are concentrated and burned as fuel. Alternatively they are used as a raw material for the production of vanillin, or they are sold in treated or untreated form as lignin sulfonates.

The primary lignin sulfonate produced by most mills is the calcium salt, although some processes produce the ammonium or the magnesium salt. These primary products may be treated to remove the sugars; they may be converted to the aluminum, chromium, iron, sodium,

or other salt; and they may be concentrated to a 50 percent solution or to a dry powder. A low-grade calcium lignin sulfonate may sell for less than two cents per pound on a dry weight basis, while a desugarized grade of some of the other salts may sell for more than ten cents per pound.

Untreated sulfite liquors or solutions of low-grade lignin sulfonates are sprayed on roads, playgrounds, and parking areas as a dust-cover, or are injected into the ground to form a water-insoluble layer for the prevention of frost-heave in rail and highway roadbeds and of leakage at dam-sites. Chemically treated lignin sulfonates are widely used as dispersing agents and emulsion stabilizers in the production of ceramics, wallboard, cement and concrete, carbon black, oil-well drilling muds, and pesticide sprays; they are used as chelating agents, as dye leveling agents, and as flotation chemicals; they are used in the tanning of leather and in pickling and plating solutions; and they are used as adhesive binders in the manufacture of charcoal briquettes, animal feed pellets, and cements for floor and ceiling tile.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
465.92	Lignin sulfonic acid and its salts	10% ad val.	5% ad val.

The rate effective January 1, 1972, represents the final stage of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. Item 465.92 was added to the TSUS on December 7, 1965. Imports of lignin sulfonates entered between August 31, 1963, and December 7, 1965, were classified in various "basket" provisions of the TSUS.

U.S. consumption, production, and foreign trade

U.S. apparent consumption of lignin sulfonates in 1966 amounted to 439 million pounds, valued at $12.7 million (see accompanying table). U.S. production of lignin sulfonates, as reported to the Tariff Commission, increased steadily from 389 million pounds, valued at $12.4 million, in 1962, to 447 million pounds, valued at $15.7 million, in 1965, and then declined to 442 million pounds, valued at $16.2 million, in 1966. It is believed that as of early 1968 there were 12 or 13 producers, all of them paper companies.

U.S. imports of lignin sulfonates amounted to 24.7 million pounds, valued at $459,000, in 1966 and 28.6 million pounds, valued at $778,000, in 1967. Although statistics are not available, it is believed that imports for 1965 were in the neighborhood of 12-15 million pounds and that imports for earlier years were correspondingly smaller. The imports have come very largely from Canada, with lesser amounts coming from the Netherlands, Norway, and Sweden; they consist principally of low-grade products, since the unit value of imports has averaged less than 3 cents per pound.

U.S. exports of lignin sulfonates (reported in official statistics as "concentrated sulfite lye") amounted to 21.5 million pounds, valued at $3.1 million, in 1965; 26.7 million pounds, valued at $3.9 million, in 1966; and 22.8 million pounds, valued at $3.3 million, in 1967. From the unit value of exports, which have averaged more than 14.5 cents per pound, and from the prominence of petroleum-producing countries in the list of countries to which U.S. exports of lignin sulfonates are shipped, it may be inferred that the exports consist largely of high-grade products, including a sizeable proportion of products used in the manufacture of oil-well drilling muds for deep-well drilling.

Lignin sulfonates: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, 1962-67

Year	Production	Imports	Exports	Apparent consumption
	Quantity (1,000 pounds)			
1962	389,075	1/	1/	1/
1963	415,035	1/	1/	1/
1964	426,788	1/	1/	1/
1965	447,207	1/	21,464	1/
1966	441,537	24,676	26,734	439,479
1967	1/	28,585	22,815	1/
	Value (1,000 dollars)			
1962	2/ 12,450	1/	1/	1/
1963	2/ 14,360	1/	1/	1/
1964	2/ 15,236	1/	1/	1/
1965	2/ 15,652	1/	3,117	1/
1966	2/ 16,160	459	3,890	12,729
1967	1/	778	3,349	1/
	Unit value (cents per pound)			
1962	3.2	1/	1/	1/
1963	3.5	1/	1/	1/
1964	3.6	1/	1/	1/
1965	3.5	1/	14.5	1/
1966	3.7	1.9	14.6	2.9
1967	1/	2.7	14.7	1/

1/ Not available.
2/ Value of production estimated from unit value of sales.

Source: Production, U.S. Tariff Commission, Synthetic Organic Chemicals, U.S. Production and Sales; imports and exports compiled from official statistics of the U.S. Department of Commerce.

Commodity	TSUS item
Castile soap	466.05
Toilet soap:	
Valued not over 20¢ per lb.	466.10
Valued over 20¢ per lb.	466.15
Soap made in whole or in part from castor oil	466.20
Other soap and soap powder (including medicinal soap and soap powder)	466.25

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

The United States is the principal world supplier of soap and soap powders and supplies more than 99 percent of its own requirements. Exports are several times larger than imports, but are not more than about 3 percent of the size of U.S. production which, in 1963, amounted to 1.2 billion pounds.

Description and uses

Soap is a detergent, or cleansing agent, obtained directly or indirectly from natural fats, oils, or greases. By chemical definition, it is, in its purest form, the salt of a fatty acid. In this summary, the term, soap (as well as the term, soap powder) is limited to formulated products that contain salts of fatty acids as the active ingredient, and which may also contain additives such as colors, brighteners, perfumes, builders, and extenders. Soaps and soap powders are used chiefly for household, laundry, and industrial cleaning. The active ingredient is usually the sodium or potassium salt of an acid such as lauric, oleic, palmitic, or stearic.

Natural fats and oils are compounds of fatty acids and glycerol. Sodium and potassium salts can be obtained by treatment of the fatty acids after first separating them chemically from the glycerol. They are not usually removed from the saponification process as pure salts, however, but have the supplementary ingredients added to them (see summary on salts of fatty acids, items 465.25-.30 and 490.30-.50).

A class of detergents of growing importance, and highly competitive with soaps, is synthetic detergents, which comprises a wide range of products obtained by chemical synthesis. These materials are discussed in the summaries on benzenoid textile assistants

and surface-active agents (items 405.30 to 405.35), on synthetic detergents (item 466.30), and on non-benzenoid textile assistants and surface-active agents (items 465.05 to 465.95 and 493.50).

Soap may be in either solid or liquid form, and is usually classified according to use. A commonly accepted system groups solid soaps as (1) toilet bars, (2) laundry bars, (3) chips and flakes, (4) granulated, powdered, and sprayed soaps, (5) mechanics bars, pastes, and powders, (6) medical and medicated soaps, (7) shaving soaps, (8) scouring cleansers, and (9) pastes and jellies. The above groupings are further subdivided according to whether they are household or non-household products and according to whether they are in bulk or packaged.

Product characteristics and methods of manufacture vary for each type of soap. Toilet soap, including castile soap, is the most important class and is usually milled soap compressed into bars; however, castile soap and some other toilet soaps are unmilled or frame-solidified. Castile soap is a pure soap made from olive oil or a mixture of oils of similar fatty acid composition. Other special types of toilet soap include transparent soaps, crystallized from alcohols; medicated soaps, containing cresylic acid, tar, sulfur, mercury, or other medicament; and mechanics' hand soaps, which usually contain more than 50 percent abrasive material.

Soap made from castor oil or sulfonated castor oil (Turkey Red oil) is of limited commercial importance.

Laundry bar soaps are either white or yellow, the latter containing a substantial proportion of rosin. Both contain builders such as sodium silicate. Naphtha soaps are white laundry soaps to which a small proportion of petroleum naphtha has been added. Soaps in the form of chips, flakes, granules, and powders, because of their quick-dissolving action, have gained in popularity in recent years over the laundry-bar-type soaps. These quick-dissolving soap products marked for general laundry use contain a substantial portion of builders, usually of the polyphosphate type. Scouring cleansers, either caked or powdered in form, contain only from 2 to 10 percent soap; the rest mainly abrasive with some builder included. Liquid soaps are largely aqueous solutions of potassium salts of coconut oil fatty acids. Other commercially important types of soap include industrial or technical soaps such as those used in commercial dry cleaning, textile processing, and synthetic rubber polymerization.

Fatty acids (items 490.10 to 490.26) present in the composition of the various fats and oils are raw materials for the manufacture of soap. They are important variables of the manufacturing process, and offer a wide range of characteristics for the finished product. The length of the fatty acid molecule and its degree of unsaturation are the prime factors underlying these characteristics. Fatty acids

whose chain lengths range between 12 and 18 carbon atoms produce the most desirable soaps and include lauric, myristic, palmitic, stearic, and oleic acids. Below this range the acids produce soaps with poor surface-active characteristics and above this range, the soaps produced are too insoluble for practical use. In general, saturated fatty acids make better soaps than unsaturated ones, and fatty acids with more than one double bond make poor detergents. In practice, poor-lathering, long fat chains such as are present in tallow account for the bulk of fats and oils used in the manufacture of soap; the shorter free-lathering fat chains such as found in coconut oil account for only a small portion.

In the manufacture of soap, fats, greases or oils are reacted with an alkali to form mixed salts of fatty acids (saponification). Thus, soaps are usually mixtures of such salts as sodium stearate, sodium laurate, sodium palmitate, sodium oleate, or sodium myristate. Glycerol (glycerin, items 428.36 and 428.38), a trihydric alcohol, is obtained as a byproduct of the saponification reaction. In the "full boiled" process the glycerol is separated from the soap; the less important semi-boiled and cold processes the glycerol remains in the soap, which is termed "framed soap." (If fatty acids are used as a starting material instead of fats or oils, glycerol is naturally not formed, since it would have been formed as a byproduct at the time the fatty acids were hydrolyzed from fats). In the "full boiled" process, the soap is separated from solution by the addition of salt, the glycerine remaining in solution. In the batch process the batch is again treated with alkali to convert any fat that has not been saponified, and the soap is then washed, dissolved with boiling water, and permitted to reform as a "neat" soap. Most soap produced commercially today is made by one of several continuous saponification processes rather than by a batch process. Although the basic operations are similar to those of soap produced batch-wise, the continuous processes are highly automated and tend toward being closed systems.

The manner in which soap is finally processed is determined by its ultimate use. For most toilet soaps, the "neat" soap is milled into chips and compressed to form bars. Perfumes, dyes, and other additives are mixed in at the milling stage. In the less-expensive framed soaps, which are cut from large slabs, the additives are incorporated at an earlier stage of processing. The quick-dissolving forms of soap such as flakes or powders are produced either by the milling of soap chips or (more commonly) by the spray drying of molten soap in a hot air chamber to produce soap granules.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
466.05	Castile soap	8.5% ad val.	4% ad val.
	Toilet soap:		
466.10	Valued not over 20¢ per lb.	1¢ per lb. + 10% ad val.	0.5¢ per lb. + 5% ad val.
466.15	Valued over 20¢ per lb.	1¢ per lb. + 6.5% ad val.	0.5¢ per lb. + 3% ad val. 1/
466.20	Soap made in whole or in part from castor oil	14% ad val.	7% ad val.
466.25	Other soap and soap powder	1¢ per lb. + 8.5% ad val.	0.5¢ per lb. + 4% ad val.

1/ This rate, as well as those for 1970 and 1971, is contingent; see footnote 1 to Staged Rates and Historical Notes to Pt. 8 of schedule 4 of the TSUSA-1968, as shown in appendix A to this volume.

The rates effective January 1, 1972, represent the final stage of concessions granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reductions became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption and production

During 1961-66, the U.S. consumption and production of soap and soap products generally continued the downward trend that began at the end of World War II. This decline in consumption was a direct result of its replacement in many uses by synthetic detergents (items 405.35 and 466.30). By 1966, sales of soap products had decreased to about 40 percent of the quantity and 60 percent of the value of soap sales in 1948. Sales of soap (excluding liquid soaps and scouring cleansers) for selected years, beginning 1948, as reported by The Soap and Detergent Association (a trade association), are as follows:

Year	Quantity (1,000 pounds)	Value (1,000 dollars)	Average unit value (per pound)
1948	2,517,790	582,666	$0.23
1958	1,138,148	324,802	.29
1961	1,014,483	312,571	.31
1962	1,041,882	317,259	.30
1963	1,026,164	322,559	.31
1964	986,854	319,085	.32
1965	967,470	339,522	.35
1966	967,133	353,897	.37

The quantity of soap sold decreased in almost every year from 1948 to 1966. The dollar value of soap sales also decreased between 1948 and 1966; however, because the average unit value of sales increased from year to year, the annual value of sales remained fairly constant between 1953 and 1964, and showed substantial increases in 1965 and 1966. The increase in the unit value of soap sales was due, at least in part, to the fact that the higher priced (mostly toilet) soaps continued to be in demand while the lower priced soaps were being displaced by synthetic detergents.

Recent official statistics on the production and shipments of soap in the United States are available only for 1958 and 1963, and are given in table 1. The U.S. production of soap amounted to 1,218 million pounds in 1958 and to 1,191 million pounds in 1963; U.S. shipments amounted to 1,248 million pounds, valued at $362 million, in 1958, and to 1,175 million pounds, valued at $354 million, in 1963. Toilet soap accounted for 43 percent of soap production in 1958 and 54 percent in 1963; it was the only class of soap for which production increased substantially in quantity between these two years. About 75 or 80 percent of the soap produced in both 1958 and 1963 was for household use.

Soap and soap powders are produced in the United States by more than 50 companies which operate a still greater number of plants and manufacture a wide range of soap products. Most of the soap produced is made by a few large companies which carry out all the steps involved in converting fats and oils into commercial end products. These companies operate numerous domestic plants and many foreign subsidiaries. The remaining U.S. soap manufacturers are relatively small concerns employing a small number of people and satisfying small, specialized markets. Unmilled or frame-solidified soap is frequently made by the small producers because only inexpensive equipment is required. Soap-producing facilities are located in all parts of the United States with the heaviest concentrations in the Middle Atlantic and North Central States and in California.

U.S. exports and imports

U.S. exports of soaps during the period, 1961-67, ranged between 23 and 27 million pounds annually (table 2), a general decrease from the 34 million pounds exported in 1958. The decline in exports was in part the result of the increased substitution of synthetic detergents and in part the result of increased activity of the overseas manufacturing facilities of domestic companies. In 1961 through 1967 soap was exported to most countries of the world; however, Canada was by far the principal destination, accounting for more than 4 million pounds, valued at more than $1 million, in each of these years. Saudi Arabia, Mexico, Japan, Panama, Lebanon, Bahamas, and Brazil were other principal destinations, each accounting for more than $250,000 in 1967. During 1961-66 the United States exported from 7 to 14 times more soap products than it imported.

U.S. imports of soap, although generally increasing between 1961 and 1966 accounted for less than 1 percent of domestic consumption. The annual quantity of imports, which was 2.0 million pounds in 1961, increased to 3.3 million pounds in 1966 and decreased to 2.8 million pounds in 1967 (table 3). The imports originated mainly in the United Kingdom and the countries of the European continent. Most of the imports were toilet soaps with prestige value. In 1966, toilet soap, valued over 20 cents per pound, accounted for 69 percent of the quantity, and 89 percent of the value, of all imports of soap.

Most of the soap imported into the United States is toilet soap (other than castile soap) valued at more than 20 cents per pound. Imports of such soap averaged 2.3 million pounds, valued at $1.6 million, annually during the 3-year period, 1965-67 (table 4) compared with an annual average of 3.1 million pounds, valued at $1.8 million, for all kinds of soap during the same period. Spain, the United Kingdom, France, and West Germany were the principal sources of these imports. Imports of low-valued toilet soap, as well as imports of castile soap, were small; the value of imports of each of these two classes of soap averaged less than $20,000 per year in 1965-67. Imports of soap other than toilet soap averaged about 676,000 pounds, valued at $150,000, annually in 1965-67; the United Kingdom was the principal market. Imports of soap made from castor oil have been negligible.

World production, consumption, and trade

Both world production and consumption of soap and soap powder (excluding scouring cleansers) were reported near 15 billion pounds in 1967, based on statistics supplied by trade sources. In that year the production of soap and soap powder increased slightly over preceding years but accounted for a smaller portion (though nearly half) of total soaps and detergents produced than in previous years. Based on geographical distribution, more than 30 percent of both world

production and consumption of soap and soap powders in 1967 were accounted for by Eastern Europe, mostly by the U.S.S.R.; more than 20 percent was accounted for by Asian countries; 15 percent by Western Europe; and about 20 percent by North and South America together. After the U.S.S.R., other large producing and consuming countries were the United States, India, the United Kingdom, Brazil, Argentina, Italy, Japan, France, West Germany, and Spain.

In terms of consumption on a per-capita basis in 1967, consumption for the United States was more than 40 pounds per person; that for Australia was 32 pounds per person. Per-capita consumption for Western Europe averaged 25 pounds per person and for Eastern Europe less than 17 pounds per person. The rate for other geographical areas was substantially lower.

International trade in soap appears to have been small compared with the size of world production. The United Kingdom, France, and the United States are believed to be the larger exporters of soap. Canada, the U.S.S.R., and certain countries of Africa are among the larger importers.

Table 1.--Soap and soap powder: U.S. production and shipments, by type, 1958 and 1963
(Quantity in millions of pounds; value in millions of dollars)

Type	Production		Shipments			
	Quantity		Quantity		Value	
	1958	1963	1958	1963	1958	1963
Household uses:						
Toilet soaps	525	642	546	637	177	216
Laundry and other bar soap	213	88	217	86	35	16
Chips, flakes, powder, etc.	226	179	231	181	63	45
Mechanics' soaps, etc.	1/	30	1/	27	2/	7
Scouring cleansers	1/	7	1/	6	2	1
Medicated, liquid, and miscellaneous	1/	1/	1/	1/	11	11
Total 3/	964	946	994	937	288	296
Non-household uses:						
Chips, flakes, powders, etc.	244	177	244	173	28	17
Mechanics' soaps	1/	59	1/	56	20	9
Scouring cleansers	10	9	10	9	2	2
Liquid and miscellaneous	1/	1/	1/	1/	24	30
Total 3/	254	245	254	238	74	58
Total, all uses 3/	1,218	1,191	1,248	1,175	362	354

1/ Not available.
2/ Included under "Non-household uses."
3/ Quantity totals do not include data categories shown as "not available."

Source: Compiled from the 1958 and 1963 Census of Manufactures taken by the Bureau of the Census.

Table 2.--Soap: U.S. exports of domestic merchandise, by principal markets, 1961-67

Market	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
Canada	8,673	5,879	5,370	7,026	5,107	5,443	3,930
Saudi Arabia	414	370	455	624	1/808	1/916	1,369
Mexico	606	516	753	1,747	989	930	1,344
Japan	612	233	804	823	1/563	1,616	1,192
Panama	1,619	1,346	1,446	1,168	1/857	1/1,372	1,386
Lebanon	919	423	476	973	1/1,543	1/943	1,149
Bahamas	362	382	502	641	696	989	800
Brazil	285	881	1,826	1,710	2/1,975	2/2,820	1,873
Australia	646	1,375	1,090	1,112	1,022	643	370
Liberia	1,297	1,067	2,216	1,464	1,685	1/223	488
All other	11,195	10,596	9,679	9,644	8,650	8,891	9,276
Total	26,628	23,068	24,617	26,932	23,895	24,786	23,177
	Value (1,000 dollars)						
Canada	1,718	1,398	1,351	1,472	1,356	1,398	1,033
Saudi Arabia	120	108	140	195	1/189	1/294	460
Mexico	166	128	210	427	271	282	455
Japan	192	91	236	249	1/186	460	453
Panama	345	313	332	321	1/258	1/381	399
Lebanon	302	134	155	329	1/276	1/297	367
Bahamas	83	102	132	175	215	311	288
Brazil	32	101	196	198	2/259	2/420	266
Australia	95	219	128	135	142	160	114
Liberia	129	105	193	185	164	1/43	54
All other	2,389	2,527	2,424	2,728	2,827	2,955	3,003
Total	6,071	5,226	5,497	6,414	6,143	7,001	6,892

1/ Does not include bulk exports, if any.
2/ Does not include packaged exports, if any.

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

Table 3.--Soap and soap powder: U.S. imports for consumption, by principal sources, 1961-67

Source	1961	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)						
Spain	299	288	326	412	527	612	732
United Kingdom	925	1,152	1,015	1,280	1,185	1,436	798
France	60	101	101	158	158	131	454
West Germany	1/209	1/163	1/280	292	242	262	196
Japan	15	24	26	40	81	225	228
Austria	296	233	93	135	142	110	7
All other	1/154	1/255	346	687	849	498	382
Total	1/1,958	1/2,216	1/2,187	3,004	3,184	3,274	2,797
	Value (1,000 dollars)						
Spain	228	295	263	365	461	514	587
United Kingdom	298	362	356	470	530	557	369
France	47	73	97	140	157	146	283
West Germany	1/127	1/105	1/248	279	223	193	152
Japan	8	11	12	20	52	146	131
Austria	144	116	62	78	91	67	7
All other	1/70	1/86	118	210	290	170	146
Total	1/922	1/1,048	1/1,156	1,562	1,804	1,793	1,675

1/ May include a small amount of alizarin assistant, Turkey red oil, or other sulfonated oils or soluble greases used in softening, dyeing, or finishing textiles.

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

Table 4.--Soap: U.S. imports for consumption, by kind and principal sources, 1965-67

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

Year	Quantity	Value	
		Total	By principal sources
	Castile Soap		
1965	24	10	Italy, 5; Spain 2; Greece, 2.
1966	18	8	Spain, 3; Italy, 2; Japan 2,; Austria, 1.
1967	36	32	Nigeria, 20; Japan, 8; Italy, 3.
	Toilet soap, valued not over 20¢ per lb.		
1965	24	5	Italy, 4.
1966	148	28	Canada, 23; Italy, 3; United Kingdom, 2.
1967	54	14	Italy, 7; Japan, 4; India, 2.
	Toilet soap, valued over 20¢ per lb.		
1965	2,523	1,634	Spain, 456; United Kingdom, 388; West Germany, 220; France, 157; Sweden, 152.
1966	2,254	1,587	Spain, 510; United Kingdom, 402; West Germany, 190; France, 145; Japan, 144.
1967	2,143	1,497	Spain, 584; France, 281; United Kingdom, 278; West Germany, 150; Japan, 119.
	Soap made from castor oil		
1965	-	-	-
1966	-	-	-
1967	2	1	West Germany, 1.
	Soap and soap powder, n.e.s.		
1965	613	155	United Kingdom, 142.
1966	854	170	United Kingdom, 153.
1967	562	131	United Kingdom, 90; Canada, 30.

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

Commodity	TSUS item
Synthetic detergents	466.30

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

Nonbenzenoid synthetic detergent formulations are a minor but substantial part of all synthetic detergent formulations produced in the United States, the world's largest producer of synthetic detergents. About 98 percent of U.S.-produced synthetic detergents, of which the nonbenzenoid detergents are a part, are consumed domestically and the importation of these products is negligible. Trade experience for the nonbenzenoid formulations is believed to be similar to that for all synthetic detergent formulations.

Description and uses

The synthetic detergents covered by this summary are formulated products used chiefly for household, laundry, and industrial cleaning purposes, and containing only nonbenzenoid surface-active agents as the active ingredient. They also contain other ingredients, such as colors, brighteners, perfumes, inerts, builders or extenders. Products containing substances which have a benzenoid, modified benzenoid, or quinonoid structure either as the active ingredient or as an additive (other than substances added as colors, brighteners, germicides, deodorizers or scents) are discussed elsewhere (see item 405.35). Similarly, detergents which are not formulated products are covered by a separate summary (items 465.05-95).

The nonbenzenoid formulated synthetic detergents covered by this summary are considerably less important commercially than benzenoid-containing detergents. Although substantial quantities of nonbenzenoid synthetic detergent materials are manufactured, most formulations that contain nonbenzenoid materials also contain a benzenoid material.

Sulfated long-chain alcohols are the most important type of nonbenzenoid detergent chemicals. The most common are the sodium, potassium, tri- and diethanolamine, and ammonium salts of dodecyl (lauryl) sulfate or octadecyl (stearyl) sulfate. The alcohols used as raw materials are derived either from natural fats and oils or by one of several synthetic processes. Frequently the sulfated alcohols

are a mixture of alcohols produced by any one of these methods. Coconut alcohols, for example, are mixtures rich in lauryl and myristyl alcohols while tallow alcohols are rich in cetyl and stearyl alcohols (items 490.65 to 490.75). Synthetically produced alcohols (item 428.12) are available as mixtures generally comparable to the naturally derived alcohols. Sodium coconut oil isothionate is also of importance among the sulfur-containing nonbenzenoid detergents and condensates of lauric acids or mixed coconut oil acids with diethanolamine are probably the most important of the non-sulfur-containing type.

Synthetic detergent formulations, in general, are marketed mainly as powders or spray-dried pellets, toilet bars, and water-based liquids. The formulation content varies for uses such as toilet, heavy duty (mainly for laundry), light duty (mainly for washing dishes and light fabrics), general-purpose cleansers, and scouring cleansers.

Builders, usually inorganic phosphates, are added to detergent formulations, principally as water softeners, to improve the effectiveness of the detergent. Sodium tripolyphosphate, trisodium pyrophosphate, tetrasodium pyrophosphate, and tetrapotassium pyrophosphate are the most common. Silicates serve as suspending and deflocculating agents as do organics such as carboxymethyl cellulose. Ethanolamides, frequently those of lauric acid or coconut acid, act as foam stabilizers, and compounds such as potassium xylenesulfonate are used in some liquid detergents to improve solubility. A variety of perfuming, coloring, and brightening materials are employed in small amounts.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
466.30	Synthetic detergents--	10.5% ad val.	5% ad val.

The rate effective January 1, 1972, represents the final stage of a concession granted by the United States in the sixth round of trade negotiations under the General Agreement on Tariffs and Trade (GATT). The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rate shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption, production, and foreign trade

The consumption and production of formulated nonbenzenoid synthetic detergents in the United States probably amounts to several hundred million pounds annually. This represents a relatively small portion of the total quantity of all synthetic detergents consumed and produced in the United States each year. During 1964-66, U.S. sales of all synthetic detergents amounted to 4 billion pounds, or more, annually.

In terms of value, about 90 percent of these sales was detergents for household use. More than half of the total value of sales was accounted for by heavy-duty dry detergents; and about a third, by liquid detergents.

Nonbenzenoid synthetic detergent formulations are produced by many of the same firms that produce benzenoid detergent formulations and soap products. Detergent producers number in the hundreds and operate plants in four-fifths of the States. They range in size from the very small to the few large companies that together account for a major share of domestic production.

U.S. exports of all types of synthetic detergents during 1962-67 were about 2 percent of U.S. production. Statistics on the portion of these exports accounted for by nonbenzenoid formulations are not available, but the ratio of such exports to the corresponding domestic output is probably comparable.

U.S. imports of all synthetic detergents during 1962-67 were much smaller than exports and accounted for less than half of 1 percent of the U.S. consumption. Imports of nonbenzenoid detergent formulations probably supplied a like percentage of their domestic consumption. During the period 1964-67, imports of nonbenzenoid synthetic detergent formulations ranged from a low of 90,000 pounds, valued at $32,000, in 1965, to a high of 310,000 pounds, valued at $110,000, in 1967 (see accompanying table). West Germany, the United Kingdom, and Canada were the principal sources. Statistics on these imports were not available prior to August 31, 1963, the effective date of the TSUS.

Synthetic detergents (nonbenzenoid formulations): U.S. imports for consumption, by principal sources, 1964-67

Source	1964	1965	1966	1967
	Quantity (1,000 pounds)			
West Germany	78	54	71	181
United Kingdom	14	17	35	85
Canada	114	7	9	25
All other	15	12	12	19
Total	221	90	127	310
	Value (1,000 dollars)			
West Germany	24	18	21	47
United Kingdom	5	4	23	46
Canada	27	2	3	11
All other	10	8	5	6
Total	66	32	52	110

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

Commodity	TSUS item
Annato, archil, cochineal, cudbear, and litmus	470.05
Brazil wood, cutch, fustic, henna, logwood, madder, Persian berry, safflower, and saffron:	
Crude	470.10
Other	470.15

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

U.S. consumption of dyeing materials is believed to be valued in excess of $2 million, a substantial part of which is supplied by imports.

Description and uses

The dyes covered by this summary are obtained from nature and, with the exception of cochineal, are of vegetable origin. Cochineal is obtained by drying and grinding the female of a species of insect that lives on cactus; the others are derived from lichens, the wood of trees, and plant parts, including the seeds, roots, leaves, fruit, and flowers. In most cases the dyeing materials are obtained from the vegetable matter by aqueous extraction, although in some cases fermentation is required. Many of the dyes included here have been known since ancient times and are still used, although many are now being replaced by synthetic dyes (items 406.02-.80) in some or all of their uses. The tabulation of pages 138 and 139 lists the dyes, the colors they furnish, their origin in nature, and their geographic sources.

Name	Color	Natural origin	Country source
Annato (bixin; butter color)	Yellow, orange-yellow, or reddish brown	Seeds of the shrub Bixa orellana	South America, the West Indies, and India.
Archil (orchil; orseille)	Dark reddish-brown	Various species of the lichens Rocella, Lecanora, Variolaria	Azores, Canary Islands, and the Mediterranean region.
Brazil wood	Bluish-red, orange, and violet-gray, when combined with salts of metals	Soluble redwoods related to species Caesalpinia, including sappon wood, peach wood, lima wood, pernambuco wood, and brazil wood	Brazil and other parts of South America.
Cochineal	Crimson and scarlet, and in purples	The insect Coccus cacti	Canary Islands, Spain, and Central America.
Cudbear	Purplish-red	The lichen Lecanora tartarea	Norway, Sweden, European mountains, and Mediterranean coast.
Cutch	Brown	Extract of the tree Acacia catechu	India and other tropical regions.
Fustic	Yellow	Heartwood of the tree Morus tinctoria	West Indies, Mexico, Central and South America.
Henna	Orange-yellow	Dried leaves of the tree Lawsonia alba	North Africa, Arabia, Iran, and Ceylon.
Litmus	Blue/red	Various species of the lichens Lecanora and Rocella	The Mediterranean region.

Name	Color	Natural origin	Country source
Logwood (campeche wood)	Purple, blue, or black, depending on auxiliary chemicals	Wood of the tree *Haematoxylon campechianum*	Tropical and subtropical Western Hemisphere.
Madder	Red and variations with certain metal salts	Root of the plant *Rubia tinctorum* and related species	Tropical and temperate zones, particularly in Asia and Europe.
Persian berry	Yellow with tin salt; orange with aluminum salt; olive green with copper salt	Dried, half-ripe fruit of the plant *Rhamnus oleoides* and related species	Spain, France, and Italy.
Safflower	Brilliant red	Dried flowers of a thistle-like plant *Carthamus tinctorius*	Southern Asia, but cultivated in Europe and Central and South America.
Saffron	Red and orange	Dried petals of the plant *Crocus sativus*	Southwestern Asia, but cultivated in Spain, France, and the United States

The principal uses of the dyeing materials covered here have been for textiles although they have applications in several other industries. Annato and cutch are used for dyeing cotton and silk; brazil wood and logwood for cotton, silk, and wool; cochineal for wool and silk; and, fustic, madder, and Persian berries for cotton. Madder contains the dye alizarin and is the source of the turkey-red color for cottons. Fustic is used in compound shades, particularly for khaki uniforms and tent cloth. Brazil wood, cochineal, madder, safflower, and saffron have been largely or entirely replaced in textile dyeing by synthetic benzenoid materials. Archil and cudbear have been used for dyeing carpet yarns, particularly to modify the effect of other dyes but also have been displaced in this use largely by synthetics. Annato, cochineal, safflower, and saffron are used in the food industry as coloring agents; annato is used in oils, butter, cheese, and margarine. Cochineal and safflower are used in confections as well as in cosmetics. Miscellaneous uses for some of the dyes include: annato for paints; logwood for printing ink; and Persian berries for staining paper and leather. Henna is well known as a hair dye and litmus as a color indicator of acidity in analytical chemistry.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
470.05	Annato, archil, cochineal, cudbear, and litmus	Free	Free 1/
	Brazil wood, cutch, fustic, henna, logwood, madder, Persian berry, safflower, and saffron:		
470.10	Crude	Free	Free 1/
470.15	Extracts	5.5% ad val.	2.5% ad val. 2/

1/ Rate not affected by the sixth round of trade negotiations under the General Agreement on Tariffs and Trade.

2/ This rate, as well as those for 1970 and 1971, in contingent; see footnote 1 to Staged Rates and Historical Notes to Pt. 9 of schedule 4 of the TSUSA-1968, as shown in appendix A to this volume.

The duty-free status of the articles described in items 470.05 and 470.10 was provided for in the Tariff Act of 1930 as originally enacted and in the TSUS, effective August 31, 1963, and has been bound by virtue of concessions granted by the United States in the General Agreement on Tariffs and Trade (GATT). The rate of duty effective January 1, 1972, for the articles in item 470.15 represents the final stage of a reduction resulting from a concession granted by the United States in the sixth round of trade negotiations under the GATT. The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rate for this item, shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967.

U.S. consumption and production

Statistics on plant shipments of natural dyeing materials in 1963, in conjunction with known imports and estimated exports in recent years, indicate that U.S. annual consumption of these materials is probably in excess of $2 million. The total value of shipments, as reported in the 1963 Census of Manufactures, amounted to $1.8 million; the amount of dyeing materials consumed by producers in the manufacture of end products is not known.

Most of the natural dyeing materials covered in this summary and the natural tanning materials covered elsewhere are produced by three establishments. Another 24 establishments produce smaller quantities of either or both of these kinds of materials. Most of the establishments are located in the Middle Atlantic and New England States.

U.S. foreign trade

Separate official statistics are not available on exports of natural dyeing materials; however, combined official statistics are available on exports of natural dyeing extracts (included in this summary) and natural tanning extracts (included in the summary covering items 470.20-.85). In 1965-67, exports of the dyeing and tanning extracts amounted to 4,187,000 pounds, valued at $1,345,000, in 1965, 4,257,000 pounds, valued at $1,515,000, in 1966, and 4,497,000 pounds, valued at $1,588,000, in 1967.

U.S. imports of the natural dyeing materials covered here are shown in the following table by total and by TSUS item for the years 1964-67. Imports for prior years were reported on a somewhat different basis and statistics for later years are not strictly comparable with statistics prior to August 31, 1963, the effective date of the TSUS. In general, however, the quantity and average unit value of imports in recent years have fluctuated from year to year. The fluctuations are attributable to variation in the kinds of dyeing materials imported as well as to the variability of supply and demand for natural products and to increasing competition from synthetics.

Natural dyeing materials: U.S. imports for consumption, 1964-67

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

	Total		TSUS 470.05		TSUS 470.10		TSUS 470.15	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1964	3,255	724	1,278	350	1,237	181	710	193
1965	6,509	742	691	284	5,044	238	774	220
1966	3,187	711	515	216	2,207	368	465	127
1967	2,271	648	295	119	1,501	390	475	139

During 1964-67, imports of annato, archil, cochineal, cudbear, and litmus (item 470.05), as a group, were considerably smaller than those of brazil wood, cutch, fustic, henna, logwood, madder, Persian berry, safflower, and saffron (items 470.10 and 470.15). Although statistics are not available on imports of individual natural dyes within each item, a partial analysis indicates that annato seed and annato extract were the principal imports in item 470.05; saffron and henna in item 470.10; and, logwood extract in item 470.15. Imports in item 470.05 decreased from 1,278,000 pounds, valued at $350,000, in 1964 to 295,000 pounds, valued at $119,000, in 1967 (table 1). Those in item 470.10 were of much lower unit value in 1964 and 1965 than in 1966 and 1967; these imports amounted to 5,044,000 pounds, valued at $238,000, in 1965 and 1,501,000 pounds, valued at $390,000, in 1967 (table 2). Annual imports in item 470.15 during 1964-67 were higher in 1964 and 1965, when they exceeded 700,000 pounds, valued near $200,000, than in 1966 and 1967, when they were less than 500,000 pounds, valued at less than $150,000 (table 3).

In 1964-67, Spain, Peru, India, Ecuador, Jamaica, and the Dominican Republic were the principal sources of the natural dyeing materials included in TSUS item 470.05 (table 1). Although Haiti was the source of a large quantity of low-unit-value imports in TSUS item 470.10, Spain was the principal source of materials on a value basis (table 2). The imports from Haiti consisted almost entirely of crude logwood, while those from Spain consisted almost entirely of crude saffron. Jamaica and France were the most important sources of imports in item 470.15 (table 3).

Table 1.--Annato, archil, cochineal, cudbear, litmus, and their extracts: U.S. imports for consumption, by principal sources, 1964-67

Source	1964	1965	1966	1967
	Quantity (1,000 pounds)			
Spain	10	37	22	13
Peru	559	405	267	103
India	55	1/	19	85
Jamaica	133	-	7	15
Ecuador	91	77	111	1
Dominican Republic	325	108	44	27
All other	105	64	45	51
Total	1,278	691	515	295
	Value (1,000 dollars)			
Spain	30	84	46	28
Peru	176	128	80	26
India	8	1	5	18
Jamaica	32	-	22	14
Ecuador	26	23	34	10
Dominican Republic	47	27	9	8
All other	31	21	20	15
Total	350	284	216	119

1/ Less than 500 pounds.

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

Table 2.--Brazil wood, cutch, fustic, henna, logwood, madder, Persian berry, safflower, and saffron, crude: U.S. imports for consumption, by principal sources, 1964-67

Source	1964	1965	1966	1967
	Quantity (1,000 pounds)			
Spain	4	2	3	3
Haiti	1,012	4,380	1,823	1,355
Italy	1	1	1/	1/
India	137	37	166	128
Nicaragua	-	546	185	-
All other	83	78	30	15
Total	1,237	5,044	2,207	1,501
	Value (1,000 dollars)			
Spain	114	143	297	281
Haiti	13	56	23	19
Italy	14	16	22	20
India	18	3	13	10
Nicaragua	-	10	4	-
All other	22	10	9	60
Total	181	238	368	390

1/ Less than 500 pounds.

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

Table 3.--Brazil wood, cutch, fustic, henna, logwood, madder, Persian berry, safflower, and saffron, other than crude: U.S. imports for consumption, by principal sources, 1964-67

Source	1964	1965	1966	1967
	Quantity (1,000 pounds)			
Jamaica	552	670	337	345
France	115	92	96	83
United Kingdom	1/	1	1	1
Trinidad	-	-	31	21
Canada	-	-	1/	-
All other	43	11	-	2/ 25
Total	710	774	465	475
	Value (1,000 dollars)			
Jamaica	151	188	88	95
France	27	22	21	25
United Kingdom	3	8	10	6
Trinidad	-	-	8	5
Canada	-	-	3/	-
All other	12	2		2/ 7
Total	193	220	127	138

1/ Less than 500 pounds.
2/ All from Italy.
3/ Less than $500.

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

NATURAL TANNING MATERIALS

Commodity	TSUS item
Canaigre, chestnut, curupay, divi-divi, eucalyptus, hemlock, larch, and tara:	
Crude	470.20
Extracts:	
Chestnut, divi-divi, and hemlock	470.23
Other	470.25
Gall nuts, crude	470.30
Gambier	470.40
Mangrove, myrobalan, oak, quebracho, sumac, urunday, and wattle:	
Crude	470.50
Extracts:	
Myrobalan and sumac	470.55
Other	470.57
Valonia:	
Crude	470.60
Extracts:	470.65
Products of vegetable origin used chiefly for coloring or tanning, not specially provided for:	
Crude	470.80
Extracts:	470.85

Note.--For the statutory description, see the Tariff Schedules of the United States Annotated (TSUSA-1968) (pertinent sections thereof are reproduced in appendix A to this volume).

U.S. trade position

U.S. consumption of the materials covered by this summary is believed to be in excess of $13 million annually, more than three-fourths of which is supplied by imports.

Description and uses

This summary covers natural tanning materials and the extracts obtained from them. It also covers those few natural dyeing materials of minor significance which are provided for in the basket items, 470.80 and 470.85.

Tanning materials are characterized by the presence of tannins, which are a group of complex organic compounds capable of converting raw hides and skins into leather. In addition to their use in the tanning of leather, tannins have other important commercial applications in inks and dyes, in mud conditioners for drilling oil and gas wells, in the preservation of fishing nets, and in preventing the formation of deposits inside steam boilers.

Although tannins are found to a varying degree in almost all plant life, only a comparatively few materials contain sufficient tannin for economic use. The tannin contained in these vegetable substances is usually leached out before utilization. The extract so obtained may be used directly in the tanning process, but most tanning extracts are reduced to a highly concentrated form, either liquid or solid, to facilitate transportation and storage and to permit more accurate control in use.

In the tanning of leather, the extract (or blend of extracts) used depends upon the kind of skin to be processed and the properties desired in the leather. Some of the better-known extracts, and their source materials, are described in the following tabulation:

Name	Natural origin	Source
Canaigre	Seeds of a plant, *Rumex hymenosepalus*	South Western United States
Chestnut extract	Bark of trees of *Castenea* spp.	Europe
Curupay	Bark of tree, *Piptadenia rigida*	South America
Divi-divi	Pods of tree, *Caesalpinea coriaria*	Venezuela, Columbia, Central America, and the West Indies
Eucalyptus extract	Bark of one species of *Eucalyptus*	Australia and Tasmania
Gall nuts	Pathological growths, generally on oaks, but also on one species of sumac	Asia Minor and eastern Mediterranean countries; China
Gambier	Leaves and twigs of woody vine, *Uncaria gambir*	Southeast Asia and Indonesia
Hemlock	Bark of hemlock trees	United States and Canada
Mangrove extract	Bark of tree, *Rhizophora mangle* and related species	Widely distributed throughout the world
Myrobalan	Fruit of *Terminalia* spp.	Far East tropical areas
Oak tannin	Bark of oak trees	Europe
Quebracho extract	Wood of tree, *Quebrachia lorentzii*	South America
Sumac	Leaves and twigs of shrubs of *Rhus* spp.	United States (Virginia sumac); Europe (Sicilian sumac)
Tara	Pods of tara tree	Peru
Urunday	Wood of trees of *Astronium* spp.	Southern South America
Valonia	The acorn of the oak *Quercus aegilops*	Greece, Asia Minor, and France
Wattle	Bark of several species of *Acacia*, especially *A. Mollissima*	Australia, Africa, Brazil, et al.

U.S. tariff treatment

The column 1 rates of duty applicable to imports (see general headnote 3 in the TSUSA-1968) are as follows:

TSUS item	Commodity	Rate prior to Jan. 1, 1968	Rate effective Jan. 1, 1972
	Canaigre, chestunut, curupay, divi-divi, eucalyptus, hemlock, larch, and tara:		
470.20	Crude	Free	Free 1/
	Extracts:		
470.23	Chestnut, divi-divi, and hemlock	4% ad val. 2/	Free
470.25	Canaigre, curupay, eucalyptus, larch, and tara	6% ad val. 2/	6% ad val. 1/
470.30	Gall nuts, crude	Free	Free 1/
470.40	Gambier	Free	Free 1/
	Mangrove, myrobalan, oak, quebracho, sumac, urunday, and wattle:		
470.50	Crude	Free	Free 1/
	Extracts:		
470.55	Myrobalan and sumac	5.5% ad val. 2/	2.5% ad val.
470.57	Mangrove, oak, quebracho, urunday, and wattle	7.5% ad val. 2/	3.5% ad val.
	Valonia:		
470.60	Crude	Free	Free 1/
470.65	Extracts	3.75% ad val. 2/	Free
	Other vegetable products used chiefly for tanning or coloring:		
470.80	Crude	Free	Free 1/
470.85	Extracts	5.5% ad val.	2.5% ad val. 3/

1/ Rate not affected by the sixth round of trade negotiations under the General Agreement on Tariffs and Trade.

2/ Suspended until Sept. 30, 1969, under P. L. 89-573 (80 Stat. 765).

3/ This rate, as well as those for 1970 and 1971, is contingent; see footnote 1 to Staged Rates and Historical Notes to Pt. 9 of schedule 4 of the TSUSA-1968, as shown in appendix A to this volume.

The duty-free status of the articles described in items 470.20, 470.30, 470.40, 470.50, 470.60, and 470.80 was provided for in the Tariff Act of 1930 as originally enacted and in the TSUS, effective August 31, 1963, and has been bound by virtue of concessions granted by the United States in the General Agreement on Tariffs and Trade (GATT). The articles described in items 470.23, 470.25, 470.55, 470.57, and 470.65 are temporarily free of duty under item 907.80. The rates of duty, effective January 1, 1972, for the articles described in items 470.23, 470.55, 470.57, 470.65, and 470.85 represent the final stage of reductions resulting from concessions granted by the United States in the sixth round of trade negotiations under the GATT. The first of five annual stages of the reduction became operative January 1, 1968. Rates of duty for the individual stages are given in the TSUSA-1968, an excerpt from which is reproduced as appendix A to this volume. The rates for these items, shown above as existing prior to January 1, 1968, remained unchanged under the TSUS from August 31, 1963 (the effective date of the TSUS), through the end of 1967, except for those temporarily suspended.

U.S. consumption and production

Based on statistics for plant shipments in 1963 and known imports and estimated exports for recent years, U.S. annual consumption of tanning materials is believed to be in excess of $13 million. The total value of shipments of tanning materials in 1963, as reported by the Census of Manufactures, was $5.2 million; the amount consumed by producers in the manufacture of end products is not shown.

Most of the natural tanning materials covered in this summary and the natural dyeing materials covered elsewhere are produced by three establishments. Another 24 establishments produce smaller quantities of either or both of these kinds of materials. Most of the establishments are located in the Middle Atlantic and New England States.

U.S. foreign trade

The annual value of U.S. exports of the materials covered by this summary is estimated at no more than 10 percent of the annual value of imports; however, the average unit value of exports is considerably higher than that of the imports; accordingly, the ratio of the quantity of exports to the quantity of imports is probably considerably less than 10 percent. Exports of the materials covered by this summary are not reported separately in official statistics but are combined with exports of the dyeing materials discussed in the summary covering items 470.05-.15. During 1965-67 the combined exports ranged between 4.2 and 4.5 million pounds, valued at from $1.3 to $1.6 million, annually and had as their principal destinations Canada, Venezuela, Mexico, the United Kingdom, Belgium, and Japan.

NATURAL TANNING MATERIALS

During 1962-67 U.S. imports of the tanning and miscellaneous dyeing materials covered herein ranged from 156 million pounds, valued at $10 million, in 1963 to nearly 190 million pounds, valued at $14 million, in 1966. Imports in 1967 amounted to 166 million pounds, valued at $12 million.

In 1967, quebracho in both the crude and extract forms constituted the largest group of imported tanning materials, accounting for 79 million pounds, valued at $5.7 million (tables 5 and 6). Imports of quebracho extract accounted for 69 million pounds, valued at $5.0 million.

Combined imports of canaigre, chestnut, curupay, divi-divi, eucalyptus, hemlock, larch, and tara, which are grouped together for tariff purposes, comprised the second largest group of imports of tanning materials in 1967. These amounted to 34 million pounds, valued at $2.6 million (tables 1, 2, and 3), of which 26 million pounds, valued at $2.1 million, were accounted for by imports of chestnut, divi-divi, and hemlock extracts.

Imports of wattle, amounting to 33 million pounds, valued at $1.6 million, comprised the third largest group of imports of tanning materials (tables 7 and 8). Of these imports, wattle extract accounted for 20 million pounds, valued at $1.2 million.

The tariff grouping of mangrove, myrobalan, oak, sumac, and urunday accounted for imports amounting to 10 million pounds, valued at $600,000, in 1967 (tables 9, 10, and 11). Extracts of these products accounted for 6 million pounds, valued at $450,000, of the total.

Imports of other materials covered by this summary included: Valonia, amounting to 3 million pounds, valued at $100,000 (table 12), about three-fourths of which was in the crude form; gall nuts, amounting to 900,000 pounds, valued at $200,000 (table 4); and tanning and dyeing materials, not elsewhere enumerated, amounting to 5 million pounds, valued at $1.2 million (table 13). The latter include those minor natural dyeing materials not provided for by TSUS items 470.05-.15. In recent years (1964-67) there have been no U.S. imports of gambier (item 470.40).

The sources for U.S. imports of the individual groups of tanning materials are shown in the tables at the end of this summary; however, of the total imports of these products, which supply the bulk of U.S. requirements, about 70 percent of the volume and 65 percent of the value are supplied by four countries--Argentina, the Republic of South Africa, Paraguay, and Canada. The following tabulation lists the principal suppliers, and the quantity and value of exports and the probable kinds of tanning materials supplied by each.

NATURAL TANNING MATERIALS

Country	Quantity 1,000 pounds	Value 1,000 dollars	Apparent principal U.S. imports
Argentina	63,643	4,583	Quebracho; wattle extract
Rep. of So. Africa	27,108	1,311	Wattle
Paraguay	14,237	1,027	Quebracho
Canada	10,482	897	Hemlock extract
Italy	8,824	850	Chestnut and quebracho extract
France	8,794	664	Chestnut extract
Australia	7,856	506	Eucalyptus
Brazil	5,333	338	Wattle, urunday, and quebracho
Peru	2,144	337	Tara and others
United Kingdom	3,128	314	Various
Mozambique	2,639	169	Wattle extract and mangrove
Turkey	3,404	158	Valonia and gall nuts
All other	8,091	922	Various
Total	165,683	12,076	

World production and trade

In international trade the three most important tanning materials are quebracho, wattle (mimosa), and chestnut. Other tanning materials traded in smaller but substantial quantities are divi-divi, gall nuts, mangrove, myrobalan, oak, sumac, tara, and valonia. The remaining tanning materials as well as the few dyeing materials covered here are of small or negligible importance.

Quebracho and its extract is produced mainly in Argentina, Paraguay, Uruguay, and Brazil and to some extent in South Africa. The United States is by far the largest importer and consumer. Wattle (mimosa) bark and extract are produced and exported principally by the Republic of South Africa, Argentina, Mozambique, and Brazil. The United Kingdom is the largest importer and consumer of wattle; the United States, India, and the Netherlands are also substantial markets. The chestnut tree is indigenous to Europe and the extract is the largest tannin in terms of production, exports, and consumption there. France and Italy are the two largest producers and exporters.

Among the tanning materials of somewhat lesser importance are divi-divi and tara which are produced only in the West Indies, Central America, and Northern South America. The trees from which gall nuts are gathered grow chiefly in Asia Minor, the Eastern Mediterranean countries, and China. Turkey and Iraq are the largest exporters to the Western World. China is probably still a large

producer and exporter although it does not supply the United States. Kenya, Mozambique, and nearby East African nations are the chief producers and exporters of mangrove bark and extract. India is the only producer of myrobalan, about 60,000 tons of which is harvested annually. Australia is the largest producer and exporter of eucalyptus extract. European countries are the chief producers and exporters of oak and sumac and their extracts. Valonia cups and beards are produced in Turkey, Greece and other Eastern Mediterranean countries.

Table 1.--Canaigre, chestnut, curupay, divi-divi, eucalyptus, hemlock, larch, and tara, crude: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Australia	-	868	1,502	3,492	3,746	3,464
Peru	4,160	2,253	1,404	3,494	4,057	710
Colombia	220	397	309	441	315	353
Italy	-	164	-	243	347	265
France	-	946	985	1,032	1,065	124
All other	862	1,827	462	137	563	190
Total	5,242	6,455	4,662	8,839	10,093	5,106
	Value (1,000 dollars)					
Australia	-	60	106	236	264	225
Peru	208	121	90	343	550	56
Colombia	15	29	23	36	32	29
Italy	-	14	-	20	26	21
France	-	68	74	67	80	9
All other	11	44	37	14	44	12
Total	234	336	330	716	996	352

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

Table 2.--Chestnut, divi-divi, and hemlock extracts: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Canada	8	4,689	10,862	10,595	12,855	10,442
France	11,074	11,920	7,740	6,755	9,403	8,451
Italy	7,836	4,801	539	3,529	6,853	7,108
All other	-	20	33	342	105	281
Total	18,918	21,430	19,174	21,221	29,216	26,282
	Value (1,000 dollars)					
Canada	2	526	1,027	1,030	1,282	894
France	740	842	593	601	699	631
Italy	556	343	35	303	506	514
All other	-	1	3	32	10	28
Total	1,298	1,712	1,658	1,966	2,497	2,067

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

Table 3.--Canaigre, curupay, eucalyptus, larch, and tara extracts: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Australia	6,020	5,142	5,508	3,564	2,573	2,978
France	-	-	809	-	-	110
Italy	-	-	-	-	529	10
All other	328	373	449	689	644	8
Total	6,348	5,515	6,766	4,253	3,746	3,106
	Value (1,000 dollars)					
Australia	339	305	347	237	165	196
France	-	16	59	-	-	8
Italy	-	-	-	-	35	3
All other	16	6	36	69	52	1
Total	355	327	442	306	252	208

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

Table 4.--Gall nuts, crude: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Iraq	-	261	360	154	392	331
Turkey	807	934	951	1,073	559	312
Lebanon	430	559	-	-	5	224
All other	14	-	127	130	143	66
Total	1,251	1,754	1,438	1,357	1,099	933
	Value (1,000 dollars)					
Iraq	-	72	130	61	162	84
Turkey	174	267	290	383	194	70
Lebanon	110	159	-	-	2	52
All other	3	-	37	39	44	13
Total	287	498	457	483	402	219

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

Table 5.--Quebracho, crude: U.S. imports for consumption, by principal sources, 1964-67

Source	1964	1965	1966	1967
	Quantity (1,000 pounds)			
Argentina	16,482	5,276	8,757	7,621
Paraguay	1,046	110	3,386	1,409
Brazil	458	-	127	551
All other	133	231	67	-
Total	18,119	5,617	12,337	9,581
	Value (1,000 dollars)			
Argentina	1,101	389	638	550
Paraguay	73	9	242	101
Brazil	29	-	9	38
All other	8	16	9	-
Total	1,211	414	898	689

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

Table 6.--Quebracho extract: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Argentina	56,763	37,556	49,543	55,922	57,964	54,055
Paraguay	29,963	21,509	25,417	29,033	19,709	12,613
All other	5,552	1,582	1,797	3,935	2,271	2,697
Total	92,278	60,647	76,757	88,890	79,944	69,365
	Value (1,000 dollars)					
Argentina	3,313	2,297	3,277	4,006	4,223	3,894
Paraguay	1,862	1,397	1,743	2,072	1,413	911
All other	304	104	126	274	164	217
Total	5,479	3,798	5,146	6,352	5,800	5,022

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

Table 7.--Wattle, crude: U.S. imports for consumption, by principal sources, 1962-67

Year	Total		Republic of South Africa		All other	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars
1962	11,419	253	11,013	241	406	12
1963	13,002	383	12,400	343	602	40
1964	16,328	551	15,644	513	684	38
1965	15,571	540	15,472	534	99	6
1966	13,246	441	11,779	364	1,467	77
1967	12,208	429	10,983	357	1,225	72

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

Table 8.--Wattle extract: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Republic of South Africa--	15,101	10,609	17,656	13,393	17,507	14,468
Argentina-------	-	117	55	110	174	1,835
Mozambique------	-	-	-	-	2,370	1,727
Brazil----------	-	-	98	2,737	2,525	1,713
United Kingdom--	46	47	34	452	657	131
All other-------	1/6,789	2/2,261	3/3,504	982	1,275	599
Total-------	21,936	13,034	21,347	17,674	24,508	20,473
	Value (1,000 dollars)					
Republic of South Africa--	847	621	1,099	920	1,031	832
Argentina-------	-	7	4	8	13	129
Mozambique------	-	-	-	-	135	95
Brazil----------	-	-	6	163	148	95
United Kingdom--	5	5	3	50	81	17
All other	1/ 385	2/ 147	3/ 226	73	81	37
Total-------	1,237	780	1,338	1,214	1,489	1,205

1/ Includes 4,863 thousand pounds, valued at $284 thousand, from British East Africa; and 1,926 pounds, valued at $101 thousand, from Rhodesia and Nyasaland.

2/ Includes 2,194 thousand pounds, valued at $143 thousand, from British East Africa.

3/ Includes 2,514 thousand pounds, valued at $164 thousand, from Kenya.

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

Table 9.--Mangrove, myrobalan, oak, sumac, and urunday, crude: U.S. imports for consumption, by principal sources, 1964-67

Source	1964	1965	1966	1967
	Quantity (1,000 pounds)			
United Kingdom	402	427	321	915
Tanzania	1,316	439	299	1,716
Mozambique	234	747	544	192
Spain	-	-	6	220
Italy	105	35	49	42
All other	1/ 7,786	2/ 3,598	3/ 3,683	1,086
Total	9,843	5,246	4,902	4,171
	Value (1,000 dollars)			
United Kingdom	36	32	33	62
Tanzania	30	10	9	29
Mozambique	18	58	45	18
Spain	-	-	1	16
Italy	12	3	9	13
All other	1/ 185	2/ 108	3/ 117	22
Total	281	211	214	160

1/ Includes 5,002 thousand pounds, valued at $82 thousand, from India; 1,293 thousand pounds, valued at $34 thousand, from Kenya; and 1,316 thousand pounds, valued at $30 thousand, from Tanganyika.

2/ Includes 1,876 thousand pounds, valued at $36 thousand, from India.

3/ Includes 2,002 thousand pounds, valued at $48 thousand, from India.

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

Table 10.--Mangrove, oak, and urunday extracts: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Brazil	-	-	-	68	527	1,751
United Kingdom	12	-	148	-	186	770
Republic of South Africa	146	225	915	142	44	734
Mozambique	1,542	901	1,228	388	771	544
Argentina	165	-	-	-	-	132
All other	1/ 1,798	925	2/ 2,624	3/ 2,043	583	270
Total	3,663	2,051	4,915	2,641	2,111	4,201
	Value (1,000 dollars)					
Brazil	-	-	-	4	30	107
United Kingdom	1	-	15	-	21	96
Republic of South Africa	11	18	59	12	4	58
Mozambique	107	64	98	32	65	46
Argentina	7	-	-	-	-	11
All other	1/ 102	59	2/ 188	3/ 136	33	20
Total	228	141	360	184	153	338

1/ Includes 1,080 thousand pounds, valued at $57 thousand, from Singapore.

2/ Includes 1,268 thousand pounds, valued at $69 thousand, from Australia.

3/ Includes 827 thousand pounds, valued at $44 thousand, from Australia.

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

Table 11.--Myrobalan and sumac extracts: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
United Kingdom	1,001	638	822	1,329	578	767
Australia	-	291	533	-	-	664
India	329	600	232	66	662	329
All other	-	-	70	120	63	25
Total	1,330	1,529	1,657	1,515	1,303	1,785
	Value (1,000 dollars)					
United Kingdom	92	55	72	121	60	67
Australia	-	13	32	-	-	36
India	9	16	5	6	17	6
All other	-	-	13	28	24	2
Total	101	84	122	155	101	111

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

Table 12.--Valonia: U.S. imports for consumption, by type, 1962-67

Year	Crude		Extract	
	Quantity	Value	Quantity	Value
	1,000 pounds	1,000 dollars	1,000 pounds	1,000 dollars
1962	1,208	23	584	50
1963	1,227	23	375	30
1964	3,212	52	309	23
1965	1,991	34	375	26
1966	2,060	45	815	45
1967	2,419	59	766	42

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

Table 13.--Products of vegetable origin used chiefly for coloring or tanning, not specially provided for: U.S. imports for consumption, by principal sources, 1962-67

Source	1962	1963	1964	1965	1966	1967
	Quantity (1,000 pounds)					
Peru	252	576	354	972	898	1,434
Dominican Republic	-	-	293	907	1,173	1,361
Ecuador	-	-	55	308	342	561
Bolivia	-	-	88	135	22	211
India	2,445	2,079	326	78	89	195
All other	422	825	2,105	2,545	1,469	1,525
Total	3,119	3,480	3,221	4,945	3,993	5,287
	Value (1,000 dollars)					
Peru	27	73	87	301	259	281
Dominican Republic	-	-	43	248	199	271
Ecuador	-	-	15	92	84	117
Bolivia	-	-	19	41	8	48
India	353	356	33	20	24	39
All other	55	163	511	524	455	419
Total	435	592	708	1,226	1,029	1,175

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 (1968): 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 pertaining to summaries in this volume.

GENERAL HEADNOTES AND RULES OF INTERPRETATION

1. Tariff Treatment of Imported Articles. All articles imported into the customs territory of the United States from outside thereof are subject to duty or exempt therefrom as prescribed in general headnote 3.

2. Customs Territory of the United States. The term "customs territory of the United States", as used in the schedules, includes only the States, the District of Columbia, and Puerto Rico.

3. Rates of Duty. The rates of duty in the "Rates of Duty" columns numbered 1 and 2 of the schedules apply to articles imported into the customs territory of the United States as hereinafter provided in this headnote:

(a) Products of Insular Possessions.

(i) Except as provided in headnote 6 of schedule 7, part 2, subpart E, [and] except as provided in headnote 4 of schedule 7, part 7, subpart A, articles imported from insular possessions of the United States which are outside the customs territory of the United States are subject to the rates of duty set forth in column numbered 1 of the schedules, except that all such articles the growth or product of any such possession, or manufactured or produced in any such possession from materials the growth, product, or manufacture of any such possession or of the customs territory of the United States, or of both, which do not contain foreign materials to the value of more than 50 percent of their total value, coming to the customs territory of the United States directly from any such possession, and all articles previously imported into the customs territory of the United States with payment of all applicable duties and taxes imposed upon or by reason of importation which were shipped from the United States, without remission, refund, or drawback of such duties or taxes, directly to the possession from which they are being returned by direct shipment, are exempt from duty.

(ii) In determining whether an article produced or manufactured in any such insular possession contains foreign materials to the value of more than 50 percent, no material shall be considered foreign which, at the time such article is entered, may be imported into the customs territory from a foreign country, other than Cuba or the Philippine Republic, and entered free of duty.

(b) Products of Cuba. Products of Cuba imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. Preferential rates of duty for such products apply only as shown in the said column 1. 1/

(c) Products of the Philippine Republic.

(i) Products of the Philippine Republic imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty which are set forth in column numbered 1 of the schedules or to fractional parts of the rates in the said column 1, as hereinafter prescribed in subdivisions (c)(ii) and (c)(iii) of this headnote.

(ii) Except as otherwise prescribed in the schedules, a Philippine article, as defined in subdivision (c)(iv) of this headnote, imported into the customs territory of the United States and entered on or before July 3, 1974, is subject to that rate which results from the application of the following percentages to the most favorable rate of duty (i.e., including a preferential rate prescribed for any product of Cuba) set forth in column numbered 1 of the schedules:

(A) 20 percent, during calendar years 1963 through 1964,

(B) 40 percent, during calendar years 1965 through 1967,

(C) 60 percent, during calendar years 1968 through 1970,

(D) 80 percent, during calendar years 1971 through 1973,

(E) 100 percent, during the period from January 1, 1974, through July 3, 1974.

(iii) Except as otherwise prescribed in the schedules, products of the Philippine Republic, other than Philippine articles, are subject to the rates of duty (except any preferential rates prescribed for products of Cuba) set forth in column numbered 1 of the schedules.

(iv) The term "Philippine article", as used in the schedules, means an article which is the product of the Philippines, but does not include any article produced with the use of materials imported into the Philippines which are products of any foreign country (except materials produced within the customs territory of the United States) if the aggregate value of such imported materials when landed at the Philippine port of entry, exclusive of any landing cost and Philippine duty, was more than 20 percent of the appraised customs value of the article imported into the customs territory of the United States.

(d) Products of Canada.

(i) Products of Canada imported into the customs territory of the United States, whether imported directly or indirectly, are subject to the rates of duty set forth in column numbered 1 of the schedules. The rates of duty for a Canadian article, as defined in subdivision (d)(ii) of this headnote, apply only as shown in the said column numbered 1.

(ii) The term "Canadian article", as used in the schedules, means an article which is the product of Canada, but does not include any article produced with the use of materials imported into Canada which are products of any foreign country (except materials produced within the customs territory of the United States), if the aggregate value of such imported materials when landed at the Canadian port of entry (that is, the actual purchase price, or if not purchased, the export value, of such materials, plus, if not included therein, the cost of transporting such materials to Canada but exclusive of any landing cost and Canadian duty) was --

(A) with regard to any motor vehicle or automobile truck tractor entered on or before December 31, 1967, more than 60 percent of the appraised value of the article imported into the customs territory of the United States; and

(B) with regard to any other article (including any motor vehicle or automobile truck tractor entered after December 31, 1967), more than 50 percent of the appraised value of the article imported into the customs territory of the United States.

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".

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

General Headnotes and Rules of Interpretation

(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 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. 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.

4. Modification or Amendment of Rates of Duty. Except as otherwise provided in the Appendix to the Tariff Schedules --

(a) a statutory rate of duty supersedes and terminates the existing rates of duty in both column numbered 1 and column numbered 2 unless otherwise specified in the amending statute;

(b) a rate of duty proclaimed pursuant to a concession granted in a trade agreement shall be reflected in column numbered 1 and, if higher than the then existing rate in column numbered 2, also in the latter column, and shall supersede but not terminate the then existing rate (or rates) in such column (or columns);

(c) a rate of duty proclaimed pursuant to section 336 of the Tariff Act of 1930 shall be reflected in both column numbered 1 and column numbered 2 and shall supersede but not terminate the then existing rates in such columns; and

(d) whenever a proclaimed rate is terminated or suspended, the rate shall revert, unless otherwise provided, to the next intervening proclaimed rate previously superseded but not terminated or, if none, to the statutory rate.

5. Intangibles. For the purposes of headnote 1 --

(a) corpses, together with their coffins and accompanying flowers,
(b) currency (metal or paper) in current circulation in any country and imported for monetary purposes,
(c) electricity,
(d) securities and similar evidences of value, and
(e) vessels which are not "yachts or pleasure boats" within the purview of subpart D, part 6, of schedule 6,

are not articles subject to the provisions of these schedules.

6. Containers or Holders for Imported Merchandise. For the purposes of the tariff schedules, containers or holders are subject to tariff treatment as follows:

(a) Imported Empty: Containers or holders if imported empty are subject to tariff treatment as imported articles and as such are subject to duty unless they are within the purview of a provision which specifically exempts them from duty.

(b) Not Imported Empty: Containers or holders if imported containing or holding articles are subject to tariff treatment as follows:

(i) The usual or ordinary types of shipping or transportation containers or holders, if not designed for, or capable of, reuse, and containers of usual types ordinarily sold at retail with their contents, are not subject to treatment as imported articles. Their cost, however, is, under section 402 or section 402a of the tariff act, a part of the value of their contents and if their contents are subject to an ad valorem rate of duty such containers or holders are, in effect, dutiable at the same rate as their contents, except that their cost is deductible from dutiable value upon submission of satisfactory proof that they are products of the United States which are being returned without having been advanced in value or improved in condition by any means while abroad.

(ii) The usual or ordinary types of shipping or transportation containers or holders, if designed for, or capable of, reuse, are subject to treatment as imported articles separate and distinct from their contents. Such holders or containers are not part of the dutiable value of their contents and are separately subject to duty upon each and every importation into the customs territory of the United States unless within the scope of a provision specifically exempting them from duty.

(iii) In the absence of context which requires otherwise, all other containers or holders are subject to the same treatment as specified in (ii) above for usual or ordinary types of shipping or transportation containers or holders designed for, or capable of, reuse.

7. Commingling of Articles. (a) Whenever articles subject to different rates of duty are so packed together or mingled that the quantity or value of each class of articles cannot be readily ascertained by customs officers (without physical segregation of the shipment or the contents of any entire package thereof), by one or more of the following means:

(i) sampling,

(ii) verification of packing lists or other documents filed at the time of entry, or

(iii) evidence showing performance of commercial settlement tests generally accepted in the trade and filed in such time and manner as may be prescribed by regulations of the Secretary of the Treasury,

the commingled articles shall be subject to the highest rate of duty applicable to any part thereof unless the consignee or his agent segregates the articles pursuant to subdivision (b) hereof.

(b) Every segregation of articles made pursuant to this headnote shall be accomplished by the consignee or his agent at the risk and expense of the consignee within 30 days (unless the Secretary authorizes in writing a longer time) after the date of personal delivery or mailing, by such employee as the Secretary of the Treasury shall designate, of written notice to the consignee that the articles are commingled and that the quantity or value of each class of articles cannot be readily ascertained by customs officers. Every such segregation shall be accomplished under customs supervision, and the compensation and expenses of the supervising customs officers shall be reimbursed to the Government by the consignee under such regulations as the Secretary of the Treasury may prescribe.

(c) The foregoing provisions of this headnote do not apply with respect to any part of a shipment if the consignee or his agent furnishes, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(i) that such part (A) is commercially negligible, (B) is not capable of segregation without excessive cost, and (C) will not be segregated prior to its use in a manufacturing process or otherwise, and

(ii) that the commingling was not intended to avoid the payment of lawful duties.

Any article with respect to which such proof is furnished shall be considered for all customs purposes as a part of the article, subject to the next lower rate of duty, with which it is commingled.

(d) The foregoing provisions of this headnote do not apply with respect to any shipment if the consignee or his agent shall furnish, in such time and manner as may be prescribed by regulations of the Secretary of the Treasury, satisfactory proof --

(i) that the value of the commingled articles is less than the aggregate value would be if the shipment were segregated;

(ii) that the shipment is not capable of segregation without excessive cost and will not be segregated prior to its use in a manufacturing process or otherwise; and

(iii) that the commingling was not intended to avoid the payment of lawful duties.

Any merchandise with respect to which such proof is furnished shall be considered for all customs purposes to be dutiable at the rate applicable to the material present in greater quantity than any other material.

(e) The provisions of this headnote shall apply only in cases where the schedules do not expressly provide a particular tariff treatment for commingled articles.

8. Abbreviations. In the schedules the following symbols and abbreviations are used with the meanings respectively indicated below:

$	-	dollars
¢	-	cents
%	-	percent
+	-	plus
ad val.	-	ad valorem
bu.	-	bushel
cu.	-	cubic
doz.	-	dozen
ft.	-	feet
gal.	-	gallon
in.	-	inches
lb.	-	pounds
oz.	-	ounces
sq.	-	square
wt.	-	weight
yd.	-	yard
pcs.	-	pieces
prs.	-	pairs
lin.	-	linear
I.R.C.	-	Internal Revenue Code

9. Definitions. For the purposes of the schedules, unless the context otherwise requires --

(a) the term "entered" means entered, or withdrawn from warehouse, for consumption in the customs territory of the United States;

(b) the term "entered for consumption" does not include withdrawals from warehouse for consumption;

(c) the term "withdrawn for consumption" means withdrawn from warehouse for consumption and does not include articles entered for consumption;

(d) the term "rate of duty" includes a free rate of duty; rates of duty proclaimed by the President shall be referred to as "proclaimed" rates of duty; rates of duty enacted by the Congress shall be referred to as "statutory" rates of duty; and the rates of duty in column numbered 2 at the time the schedules become effective shall be referred to as "original statutory" rates of duty;

(e) the term "ton" means 2,240 pounds, and the term "short ton" means 2,000 pounds;

(f) the terms "of", "wholly of", "almost wholly of", "in part of" and "containing", when used between the description of an article and a material (e.g., "furniture of wood", "woven fabrics, wholly of cotton", etc.), have the following meanings:

(i) "of" means that the article is wholly or in chief value of the named material;

(ii) "wholly of" means that the article is, except for negligible or insignificant quantities of some other material or materials, composed completely of the named material;

(iii) "almost wholly of" means that the essential character of the article is imparted by the named material, notwithstanding the fact that significant quantities of some other material or materials may be present; and

(iv) "in part of" or "containing" mean that the article contains a significant quantity of the named material.

With regard to the application of the quantitative concepts specified in subparagraphs (ii) and (iv) above, it is intended that the de minimis rule apply.

10. General Interpretative Rules. For the purposes of these schedules --

(a) the general, schedule, part, and subpart headnotes, and the provisions describing the classes of imported articles and specifying the rates of duty or other import restrictions to be imposed thereon are subject to the rules of interpretation set forth herein and to such other rules of statutory interpretation, not inconsistent therewith, as have been or may be developed under administrative or judicial rulings;

(b) the titles of the various schedules, parts, and subparts and the footnotes therein are intended for convenience in reference only and have no legal or interpretative significance;

(c) an imported article which is described in two or more provisions of the schedules is classifiable in the provision which most specifically describes it; but, in applying this rule of interpretation, the following considerations shall govern:

(i) a superior heading cannot be enlarged by inferior headings indented under it but can be limited thereby;

(ii) comparisons are to be made only between provisions of coordinate or equal status, i.e., between the primary or main superior headings of the schedules or between coordinate inferior headings which are subordinate to the same superior heading;

(d) if two or more tariff descriptions are equally applicable to an article, such article shall be subject to duty under the description for which the original statutory rate is highest, and, should the highest original statutory rate be applicable to two or more of such descriptions, the article shall be subject to duty under that one of such descriptions which first appears in the schedules;

(e) in the absence of special language or context which otherwise requires --

(i) a tariff classification controlled by use (other than actual use) is to be determined in accordance with the use in the United States at, or immediately prior to, the date of importation, of articles of that class or kind to which the imported articles belong, and the controlling use is the chief use, i.e., the use which exceeds all other uses (if any) combined;

(ii) a tariff classification controlled by the actual use to which an imported article is put in the United States is satisfied only if such use is intended at the time of importation, the article is so used, and proof thereof is furnished within 3 years after the date the article is entered;

(f) an article is in chief value of a material if such material exceeds in value each other single component material of the article;

(g) a headnote provision which enumerates articles not included in a schedule, part, or subpart is not necessarily exhaustive, and the absence of a particular article from such headnote provision shall not be given weight in determining the relative specificity of competing provisions which describe such article;

(h) unless the context requires otherwise, a tariff description for an article covers such article, whether assembled or not assembled, and whether finished or not finished;

(ij) a provision for "parts" of an article covers a product solely or chiefly used as a part of such article, but does not prevail over a specific provision for such part.

11. Issuance of Rules and Regulations. The Secretary of the Treasury is hereby authorized to issue rules and regulations governing the admission of articles under the provisions of the schedules. The allowance of an importer's claim for classification, under any of the provisions of the schedules which provide for total or partial relief from duty or other import restrictions on the basis of facts which are not determinable from an examination of the article itself in its condition as imported, is dependent upon his complying with any rules or regulations which may be issued pursuant to this headnote.

12. The Secretary of the Treasury is authorized to prescribe methods of analyzing, testing, sampling, weighing, gauging, measuring, or other methods of ascertainment whenever he finds that such methods are necessary to determine the physical, chemical, or other properties or characteristics of articles for purposes of any law administered by the Customs Service.

General statistical headnotes:

1. Statistical Requirements for Imported Articles. Persons making customs entry or withdrawal of articles imported into the customs territory of the United States shall complete the entry or withdrawal forms, as provided herein and in regulations issued pursuant to law, to provide for statistical purposes information as follows:

(a) the number of the Customs district and of the port where the articles are being entered for consumption or warehouse, as shown in Statistical Annex A of these schedules;

(b) the name of the carrier or the means of transportation by which the articles were transported to the first port of unloading in the United States;

(c) the foreign port of lading;

(d) the United States port of unlading;

(e) the date of importation;

(f) the country of origin of the articles expressed in terms of the designation therefor in Statistical Annex B of these schedules;

(g) a description of the articles in sufficient detail to permit the classification thereof under the proper statistical reporting number in these schedules;

(h) the statistical reporting number under which the articles are classifiable;

(ij) gross weight in pounds for the articles covered by each reporting number when imported in vessels or aircraft;

(k) the net quantity in the units specified herein for the classification involved;

(l) the U.S. dollar value in accordance with the definition in Section 402 or 402a of the Tariff Act of 1930, as amended, for all merchandise including that free of duty or dutiable at specific rates; and

(m) such other information with respect to the imported articles as is provided for elsewhere in these schedules.

2. Statistical Annotations. (a) The statistical annotations to the Tariff Schedules of the United States consist of --

(i) the 2-digit statistical suffixes,
(ii) the indicated units of quantity,
(iii) the statistical headnotes and annexes, and
(iv) the italicized article descriptions.

(b) The legal text of the Tariff Schedules of the United States consists of the remaining text as more specifically identified in headnote 10(a) of the general headnotes and rules of interpretation.

(c) The statistical annotations are subordinate to the provisions of the legal text and cannot change their scope.

3. Statistical Reporting Number. (a) General Rule: Except as provided in paragraph (b) of this headnote, and in the absence of specific instructions to the contrary elsewhere, the statistical reporting number for an article consists of the 7-digit number formed by combining the 5-digit item number with the appropriate 2-digit statistical suffix. Thus, the statistical reporting number for live monkeys dutiable under item 100.95 is "100.9520".

(b) Wherever in the tariff schedules an article is classifiable under a provision which derives its rate of duty from a different provision, the statistical reporting number is, in the absence of specific instructions to the contrary elsewhere, the 7-digit number for the basic provision followed by the item number of the provision from which the rate is derived. Thus, the statistical reporting number of mixed apple and grape juices, not containing over 1.0 percent of ethyl alcohol by volume, is "165.6500-165.40".

4. Abbreviations. (a) The following symbols and abbreviations are used with the meanings respectively indicated below:

s. ton	-	short ton
C.	-	one hundred
Cwt.	-	100 lbs.
mg.	-	milligram
M.	-	1,000
bd. ft.	-	board feet
M. bd. ft.	-	1,000 board feet
mc.	-	millicurie
cord	-	128 cubic feet
square	-	amount to cover 100 square feet of surface
sup. ft.	-	superficial foot
oz.	-	ounces avoirdupois
fl. oz.	-	fluid ounce
oz. troy	-	troy ounce
pf. gal.	-	proof gallon

(b) An "X" appearing in the column for units of quantity means that no quantity (other than gross weight) is to be reported.

(c) Whenever two separate units of quantity are shown for the same article, the "v" following one of such units means that the value of the article is to be reported with that quantity.

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HISTORICAL NOTES

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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.
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 4. - CHEMICALS AND RELATED PRODUCTS

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

SCHEDULE 4. - CHEMICALS AND RELATED PRODUCTS

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Schedule 4 headnotes:

1. This schedule does not include --
   (i) any of the mineral products provided for in schedule 5;
   (ii) metal-bearing ores and other metal-bearing materials, provided for in part 1 of schedule 6; or
   (iii) metals provided for in part 2 of schedule 6.

2. (a) The term "compounds", as used in this schedule, means substances occurring naturally or produced artificially by the reaction of two or more ingredients, each compound --
   (i) consisting of two or more elements,
   (ii) having its own characteristic properties different from those of its elements and from those of other compounds, and
   (iii) always consisting of the same elements united in the same proportions by weight with the same internal arrangement.

The presence of impurities which occur naturally or as an incident to production does not in itself affect the classification of a product as a compound.

(b) The term "compounds", as used in this schedule, includes a solution of a single compound in water, and, in determining the amount of duty on any such compound subject to duty in this schedule at a specific rate, an allowance in weight or volume, as the case may be, shall be made for the water in excess of any water of crystallization which may have been in the compound.

3. (a) The term "mixtures", as used in this schedule, means substances consisting of two or more ingredients (i.e., elements or compounds), whether occurring as such in nature, or whether artificially produced (i.e., brought about by mechanical, physical, or chemical means), which do not bear a fixed ratio to one another and which, however thoroughly commingled, retain their individual chemical properties and are not chemically united. The fact that the ingredients of a product are incapable of separation or have been commingled in definite proportions does not in itself affect the classification of such product as a mixture.

(b) The term "mixtures", as used in this schedule, includes solutions, except solutions defined as compounds in headnote 2(b) of this schedule.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

SCHEDULE 4. - CHEMICALS AND RELATED PRODUCTS
Part 6. - Glue, Gelatin, and Related Products

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 6. - GLUE, GELATIN, AND RELATED PRODUCTS			
		Part 6 headnote:			
		1. The glue, gelatin, and other products in this part are products of animal or vegetable origin. The classification of these products in the provisions of this part is not affected by the addition to such products of any product described in part 1 of this schedule as a deodorant or preservative or to control viscosity.			
455.02	00	Agar agar	Lb.	13% ad val.	25% ad val.
455.04	00	Pectin	Lb.	9% ad val.	25% ad val.
455.06	00	Isinglass	Lb.	15% ad val.	25% ad val.
455.08	00	Bones, crude, steamed, or ground	S. ton.	Free	Free
455.10	00	Hide cuttings, raw, with or without hair	Lb.	Free	Free
455.12	00	Ossein	Lb.	Free	Free
455.14	00	Glue stock, not specially provided for	Lb.	Free	Free
		Edible gelatin:			
455.16	00	Valued under 40 cents per pound	Lb.	1.4¢ per lb. + 7% ad val.	5¢ per lb. + 12% ad val.
455.18	00	Valued 40 or more but not over 80 cents per pound	Lb.	2.4¢ per lb. + 9% ad val.	7¢ per lb. + 20% ad val.
455.20	00	Valued over 80 cents per pound	Lb.	3.5¢ per lb. + 11% ad val.	7¢ per lb. + 20% ad val.
		Photographic gelatin:			
455.22	00	Valued not over 80 cents per pound	Lb.	2.4¢ per lb. + 9% ad val.	7¢ per lb. + 20% ad val.
455.24	00	Valued over 80 cents per pound	Lb.	3.8¢ per lb. + 11% ad val.	7¢ per lb. + 20% ad val.
		Glue, glue size, and inedible gelatin:			
		Vegetable glue:			
455.30	00	Valued under 40 cents per pound	Lb.	0.9¢ per lb. + 11% ad val.	2¢ per lb. + 25% ad val.
455.32	00	Valued 40 cents or more per pound	Lb.	3.5¢ per lb. + 11% ad val.	8¢ per lb. + 25% ad val.
455.34	00	Casein glue	Lb.	13% ad val.	30% ad val.
		Fish glue:			
455.36	00	Valued under 40 cents per pound	Lb.	0.45¢ per lb. + 6.5% ad val.	2¢ per lb. + 25% ad val.
455.38	00	Valued 40 cents or more per pound	Lb.	3.5¢ per lb. + 11% ad val.	8¢ per lb. + 25% ad val.
		Inedible gelatin and animal glue:			
455.40	00	Valued under 40 cents per pound	Lb.	1.4¢ per lb. + 9% ad val.	2.5¢ per lb. + 20% ad val.
455.42	00	Valued 40 cents or more per pound	Lb.	3.5¢ per lb. + 11% ad val.	8¢ per lb. + 25% ad val.
		Glue size:			
455.44	00	Valued under 40 cents per pound	Lb.	0.45¢ per lb. + 6.5% ad val.	2¢ per lb. + 25% ad val.
455.46	00	Valued 40 cents or more per pound	Lb.	3.5¢ per lb. + 11% ad val.	8¢ per lb. + 25% ad val.

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STAGED RATES AND HISTORICAL NOTES

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Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 11, 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
455.02	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
455.04	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
455.06	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
455.16	1.6¢ per lb. + 8% ad val.	1.4¢ per lb. + 7% ad val.	1.25¢ per lb. + 6% ad val.	1¢ per lb. + 5.5% ad val.	0.9¢ per lb. + 4.5% ad val.	0.8¢ per lb. + 4% ad val.
455.18	2.75¢ per lb. + 10% ad val.	2.4¢ per lb. + 9% ad val.	2¢ per lb. + 8% ad val.	1.9¢ per lb. + 7% ad val.	1.5¢ per lb. + 6% ad val.	1.3¢ per lb. + 5% ad val.
455.20	4.25¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.9¢ per lb. + 8.5% ad val.	2¢ per lb. + 7.5% ad val.	2¢ per lb. + 6% ad val.
455.22	2.75¢ per lb. + 10% ad val.	2.4¢ per lb. + 9% ad val.	2¢ per lb. + 8% ad val.	1.9¢ per lb. + 7% ad val.	1.3¢ per lb. + 6% ad val.	1.3¢ per lb. + 5% ad val.
455.24	4.25¢ per lb. + 12.5% ad val.	3.8¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.9¢ per lb. + 8.5% ad val.	2.5¢ per lb. + 7.5% ad val.	2¢ per lb. + 6% ad val.
455.30	1¢ per lb. + 12.5% ad val.	0.9¢ per lb. + 11% ad val.	0.8¢ per lb. + 10% ad val.	0.7¢ per lb. + 8.5% ad val.	0.6¢ per lb. + 7% ad val.	0.5¢ per lb. + 6% ad val.
455.32	4¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.8¢ per lb. + 8.5% ad val.	2.4¢ per lb. + 7% ad val.	2¢ per lb. + 6% ad val.
455.34	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
455.36	0.5¢ per lb. + 7.5% ad val.	0.45¢ per lb. + 6.5% ad val.	0.4¢ per lb. + 6% ad val.	0.35¢ per lb. + 5% ad val.	0.3¢ per lb. + 4% ad val.	0.25¢ per lb. + 3.5% ad val.
455.38	4¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.8¢ per lb. + 8.5% ad val.	2.4¢ per lb. + 7% ad val.	2¢ per lb. + 6% ad val.
455.40	1.625¢ per lb. + 10% ad val.	1.4¢ per lb. + 9% ad val.	1.3¢ per lb. + 8% ad val.	1.1¢ per lb. + 7% ad val.	0.97¢ per lb. + 6% ad val.	0.8¢ per lb. + 5% ad val.
455.42	4¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.8¢ per lb. + 8.5% ad val.	2.4¢ per lb. + 7% ad val.	2¢ per lb. + 6% ad val.
455.44	0.5¢ per lb. + 7.5% ad val.	0.45¢ per lb. + 6.5% ad val.	0.4¢ per lb. + 6% ad val.	0.35¢ per lb. + 5% ad val.	0.3¢ per lb. + 4% ad val.	0.25¢ per lb. + 3.5% ad val.
455.46	4¢ per lb. + 12.5% ad val.	3.5¢ per lb. + 11% ad val.	3¢ per lb. + 10% ad val.	2.5¢ per lb. + 8.5% ad val.	2.4¢ per lb. + 7% ad val.	2¢ per lb. + 6% ad val.

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 7. - AROMATIC OR ODORIFEROUS SUBSTANCES; PERFUMERY, COSMETICS, AND TOILET PREPARATIONS			
		Subpart A. - Aromatic and Odoriferous Substances			
		Subpart A headnote:			
		1. This subpart covers aromatic or odoriferous substances, natural and synthetic (including artificial mixtures containing aromatic or odoriferous compounds provided for in part 1C of this schedule, but not including products provided for in part 5 of this schedule), which are chiefly used in the manufacture of perfumery, cosmetics, or toilet preparations, or otherwise for the purpose of scenting or of counteracting undesirable odors, but which themselves are not marketable as perfumery, cosmetics, or toilet preparations.			
460.05	00	Enfleurage greases, floral essences, floral concretes, and other aromatic or odoriferous substances obtained from natural substances by enfleurage, maceration, or extraction, all the foregoing containing no alcohol	Lb.....	Free	Free
		Aromatic or odoriferous substances containing no alcohol or not over 10 percent alcohol by weight:			
		Not artificial mixtures (other than substances admixed with alcohol):			
460.10	00	Ambergris	Oz.....	7% ad val.	20% ad val.
460.15	00	Anethol	Lb.....	21.5% ad val.	45% ad val.
460.20	00	Castoreum	Oz.....	18% ad val.	20% ad val.
460.25	00	Citral	Lb.....	21.5% ad val.	45% ad val.
460.30	00	Civet	Oz.....	14% ad val.	20% ad val.
460.35	00	Geraniol	Lb.....	13% ad val.	45% ad val.
460.40	00	Heliotropin	Lb.....	21.5% ad val.	45% ad val.
460.45	00	Hydroxycitronellal	Lb.....	13% ad val.	45% ad val.
460.50	00	Ionone	Lb.....	21.5% ad val.	45% ad val.
460.55	00	Linalyl acetate	Lb.....	32% ad val.	45% ad val.
460.60	00	Musk, grained or in pods	Oz.....	18% ad val.	20% ad val.
460.65	00	Rhodinol	Lb.....	21.5% ad val.	45% ad val.
460.70	00	Safrol	Lb.....	27% ad val.	45% ad val.
460.75	00	Terpineol	Lb.....	21.5% ad val.	45% ad val.
460.80	00	Other	Lb.....	21.5% ad val.	45% ad val.
460.85	00	Artificial mixtures	Lb.....	14¢ per lb. + 10.5% ad val.	40¢ per lb. + 50% ad val.
460.90	00	Aromatic and odoriferous substances containing over 10 percent alcohol by weight	Lb.....	14.4¢ per lb. + 13% ad val.	40¢ per lb. + 75% ad val.

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SCHEDULE 4. - CHEMICALS AND RELATED PRODUCTS

Part 7. - Aromatic or Odoriferous Substances; Perfumery, Cosmetics and Toilet Preparations

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart B. - Perfumery, Cosmetics, and Toilet Preparations			
		Subpart B headnote:			
		1. The term "cosmetics and other toilet preparations" in this subpart covers products such as dentifrices, powders, lotions, pastes, and creams, whether or not described in part 1 of this schedule, chiefly used in applications to the surface of the human body for lending attractiveness, for theatrical make-up, or for cleansing or conditioning the hair, mouth, teeth, skin, or nails, but the term does not include any of the products described in part 8 of this schedule.			
		Bath salts, whether or not having medicinal properties:			
461.05	00	Not perfumed	Lb.	13% ad val.	25% ad val.
461.10	00	Perfumed	Lb.	18% ad val.	75% ad val.
461.15	00	Bay rum or bay water	Lb.	14.4¢ per lb. + 21.5% ad val.	40¢ per lb. + 60% ad val.
461.20	00	Floral or flower waters	Gal.	4% ad val.	20% ad val.
		Perfumes, colognes, and toilet waters:			
461.30	00	Not containing alcohol	Lb.	13% ad val.	75% ad val.
461.35	00	Containing alcohol	Lb.	14.4¢ per lb. + 13% ad val.	40¢ per lb. + 75% ad val.
		Cosmetics and other toilet preparations:			
461.40	00	Not containing alcohol	X	13% ad val.	75% ad val.
461.45	00	Containing alcohol	Lb.	14.4¢ per lb. + 13% ad val.	40¢ per lb. + 75% ad val.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 1
Schedule 4,
Part 7

Staged Rates

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
460.10	8% ad val.	7% ad val.	6% ad val.	5.5% ad val.	4.5% ad val.	4% ad val.
460.15	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.20	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
460.25	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.30	16% ad val.	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.
460.35	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
460.40	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.45	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
460.50	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.55	36% ad val.	32% ad val.	28.5% ad val.	25% ad val.	21.5% ad val.	18% ad val.
460.60	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
460.65	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.70	30% ad val.	27% ad val.	24% ad val.	21% ad val.	18% ad val.	15% ad val.
460.75	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.80	24% ad val.	21.5% ad val.	19% ad val.	16.5% ad val.	14% ad val.	12% ad val.
460.85	16¢ per lb. + 12% ad val.	14¢ per lb. + 10.5% ad val.	12¢ per lb. + 9.5% ad val.	11¢ per lb. + 8% ad val.	9¢ per lb. + 7% ad val.	8¢ per lb. + 6% ad val.
460.90	16¢ per lb. + 15% ad val.	14.4¢ per lb. + 13% ad val.	12¢ per lb. + 12% ad val.	11.2¢ per lb. + 10% ad val.	9¢ per lb. + 9% ad val.	8¢ per lb. + 7.5% ad val.
461.05	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
461.10	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
461.15	16¢ per lb. + 24% ad val.	14.4¢ per lb. + 21.5% ad val.	12.8¢ per lb. + 19% ad val.	11.2¢ per lb. + 16.5% ad val.	9.6¢ per lb. + 14% ad val.	8¢ per lb. + 12% ad val.
461.20 1/	5% ad val.	4% ad val.	4% ad val.	3% ad val.	3% ad val.	2.5% ad val.
461.30	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
461.35	16¢ per lb. + 15% ad val.	14.4¢ per lb. + 13% ad val.	12¢ per lb. + 12% ad val.	11.2¢ per lb. + 10% ad val.	9¢ per lb. + 9% ad val.	8¢ per lb. + 7.5% ad val.
461.40	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
461.45	16¢ per lb. + 15% ad val.	14.4¢ per lb. + 13% ad val.	12¢ per lb. + 12% ad val.	11.2¢ per lb. + 10% ad val.	9¢ per lb. + 9% ad val.	8¢ per lb. + 7.5% ad val.

1/ In accordance with general note 3(f) to Schedule XX (Geneva - 1967), the rates of duty for this item in the columns headed 1970, 1971, 1972 will become effective unless the European Economic Community and the United Kingdom do not proceed with certain reductions provided for in their respective schedules annexed to the Geneva (1967) Protocol to the GATT. If these two participants do not so proceed, the President shall so proclaim, and the rate of duty in the column headed 1969 will continue in effect unless or until the President proclaims that they have agreed so to proceed. See related footnote 1 to Kennedy Round Staged Rates at the end of schedule 4, parts 3, 4, 5, 7, 8, 9, and 13; schedule 5, part 1; schedule 6, part 2; and schedule 7, parts 2, 9, 12, and 13.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

SCHEDULE 4. - CHEMICALS AND RELATED PRODUCTS
Part 8. - Surface-Active Agents; Soaps and Synthetic Detergents

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 8. - SURFACE-ACTIVE AGENTS; SOAPS AND SYNTHETIC DETERGENTS			
		Part 8 headnote:			
		1. This part covers surface-active agents, soaps, and synthetic detergents, except those provided for in items 405.30 and 405.35 of part 1C of this schedule. This part also covers certain specified products which may or may not be surface-active agents. The addition of any product described in part 1 of this schedule to these products as a color, brightener, germicide, deodorizer, whitener, or scent does not affect their classification under this part (8).			
		Subpart A. - Surface-Active Agents			
		Subpart A headnote:			
		1. The term "surface-active agents", as used in item 465.95 means synthetic organic chemical compounds, or mixtures thereof, which function as surface tension modifiers and are chiefly used for any one or combination of the following purposes: As detergents, wetting agents, emulsifiers, dispersants, or foaming agents			
		Fatty substances of animal (including marine animal) or vegetable origin:			
		Not sulfonated or sulfated:			
		Fatty-acid esters, ethers, and ether-esters of polyhydric alcohols:			
465.05	00	Derived from coconut, palm-kernel, or palm oil	Lb.	2.7¢ per lb. + 13% ad val.	6¢ per lb. + 30% ad val.
465.10	00	Other	Lb.	3.3¢ per lb. + 13.5% ad val.	7.5¢ per lb. + 30% ad val.
		Fatty-acid amides, amines, and quaternary ammonium salts:			
465.15	00	Derived from coconut, palm-kernel, or palm oil	Lb.	2.7¢ per lb. + 13% ad val.	6¢ per lb. + 30% ad val.
465.20	00	Other	Lb.	3.3¢ per lb. + 13.5% ad val.	7.5¢ per lb. + 30% ad val.
		Sodium and potassium salts of fats, oils, and greases, and of fatty acids derived therefrom:			
465.25	00	Derived from coconut, palm-kernel, or palm oil	Lb.	9% ad val.	25% ad val.
465.30	00	Other	Lb.	1.3¢ per lb. + 9% ad val.	5¢ per lb. + 25% ad val.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

SCHEDULE 4. - CHEMICALS AND RELATED PRODUCTS
Part 8. - Surface-Active Agents; Soaps and Synthetic Detergents

4 - 8 - A
465.35 - 465.95

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Fatty substances of animal, etc. (con.):			
		Sulfonated or sulfated:			
		Fatty acids and salts of fatty acids:			
465.35	00	Derived from coconut, palm-kernel, or palm oil	Lb.	9% ad val.	25% ad val.
465.40	00	Other	Lb.	1.3¢ per lb. + 9% ad val.	3¢ per lb. + 25% ad val.
		Fatty alcohols and salts of fatty alcohols:			
465.45	00	Derived from coconut, palm-kernel, or palm oil	Lb.	9% ad val.	25% ad val.
465.50	00	Other	Lb.	1.3¢ per lb. + 9% ad val.	3¢ per lb. + 25% ad val.
		Fatty-acid esters, ethers, amides, and amines:			
465.55	00	Derived from coconut, palm-kernel, or palm oil	Lb.	9% ad val.	25% ad val.
465.60	00	Other	Lb.	0.6¢ per lb. + 9.4% ad val.	1.5¢ per lb. + 25% ad val.
		Fats, oils, and greases, all the foregoing sulfonated or sulfated:			
465.65	00	Coconut, palm-kernel, and palm oils	Lb.	12.5% ad val.	35% ad val.
465.70	00	Tallow	Lb.	0.65¢ per lb. + 12.5% ad val.	3¢ per lb. + 35% ad val.
465.75	00	Wool grease	Lb.	1.8¢ per lb. + 12.5% ad val.	3¢ per lb. + 35% ad val.
		Other:			
465.80	00	Animal (including marine animal)	Lb.	1.3¢ per lb. + 12.5% ad val.	3¢ per lb. + 35% ad val.
465.85	00	Vegetable	Lb.	12.5% ad val.	35% ad val.
465.87	00	Carboxymethyl cellulose salts	Lb.	14.4¢ per lb.	45¢ per lb.
465.90	00	Dibasic-acid esters, ethers, amides and amines, all the foregoing sulfonated or sulfated	Lb.	9% ad val.	25% ad val.
465.92	00	Lignin sulfonic acid and its salts	Lb.	9% ad val.	20% ad val.
465.95	00	Surface-active agents (except surface-active agents described elsewhere in this part)	Lb.	9% ad val.	25% ad val.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

SCHEDULE 4. - CHEMICALS AND RELATED PRODUCTS
Part 8. - Surface-Active Agents; Soaps and Synthetic Detergents

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart B. - Soap and Synthetic Detergents			
		Subpart B headnote: 1. For the purposes of this subpart -- (a) the terms "soap" and "soap powder" embrace formulated products, which are used chiefly for household, laundry, and industrial cleaning purposes, and which contain salts of fatty acids (usually sodium or potassium salts of such fatty acids as lauric, oleic, palmitic, and stearic acids) obtained directly or indirectly from natural oils, fats, and greases, and which may contain added ingredients such as colors, brighteners, perfumes, and builders and extenders including rosin, wax, inorganic salts, and alkaline detergents; and (b) the term "synthetic detergents" embraces formulated materials which are used chiefly for household, laundry, and industrial cleaning purposes, and which consist of one or more surface-active agents as the active ingredients in combination with colors, brighteners, perfumes, inert diluents, builders and extenders such as inorganic salts, polyphosphates, polysilicates or sodium carboxymethylcellulose.			
466.05	00	Castile soap	Lb.	7.5% ad val.	15% ad val.
		Toilet soap:			
466.10	00	Valued not over 20 cents per pound	Lb.	0.9¢ per lb. + 9% ad val.	2¢ per lb. + 30% ad val.
466.15	00	Valued over 20 cents per pound	Lb.	0.9¢ per lb. + 5.5% ad val.	2¢ per lb. + 30% ad val.
466.20	00	Soap made in whole or in part from castor oil	Lb.	12.5% ad val.	35% ad val.
466.25	00	Other soap and soap powder (including all medicinal soap and soap powder)	Lb.	0.9¢ per lb. + 7.5% ad val.	2¢ per lb. + 15% ad val.
466.30	00	Synthetic detergents	Lb.	9% ad val.	25% ad val.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 1
Schedule 4,
Part 8

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3821 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19001:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
465.05	3¢ per lb. + 15% ad val.	2.7¢ per lb. + 13% ad val.	2.4¢ per lb. + 12% ad val.	2.1¢ per lb. + 10% ad val.	1.8¢ per lb. + 9% ad val.	1.5¢ per lb. + 7.5% ad val.
465.10	3.75¢ per lb. + 15% ad val.	3.3¢ per lb. + 13.5% ad val.	3¢ per lb. + 12% ad val.	2.5¢ per lb. + 10.5% ad val.	2.2¢ per lb. + 9% ad val.	1.8¢ per lb. + 7.5% ad val.
465.15	3¢ per lb. + 15% ad val.	2.7¢ per lb. + 13% ad val.	2.4¢ per lb. + 12% ad val.	2.1¢ per lb. + 10% ad val.	1.8¢ per lb. + 9% ad val.	1.5¢ per lb. + 7.5% ad val.
465.20	3.75¢ per lb. + 15% ad val.	3.3¢ per lb. + 13.5% ad val.	3¢ per lb. + 12% ad val.	2.5¢ per lb. + 10.5% ad val.	2.2¢ per lb. + 9% ad val.	1.8¢ per lb. + 7.5% ad val.
465.25	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
465.30	1.5¢ per lb. + 10% ad val.	1.3¢ per lb. + 9% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.	0.9¢ per lb. + 6% ad val.	0.7¢ per lb. + 5% ad val.
465.35	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
465.40	1.5¢ per lb. + 10% ad val.	1.3¢ per lb. + 9% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.	0.9¢ per lb. + 6% ad val.	0.7¢ per lb. + 5% ad val.
465.45	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
465.50	1.5¢ per lb. + 10% ad val.	1.3¢ per lb. + 9% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.	0.9¢ per lb. + 6% ad val.	0.7¢ per lb. + 5% ad val.
465.55	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
465.60	0.75¢ per lb. + 10.5% ad val.	0.6¢ per lb. + 9.4% ad val.	0.6¢ per lb. + 8% ad val.	0.5¢ per lb. + 7% ad val.	0.4¢ per lb. + 6% ad val.	0.3¢ per lb. + 5% ad val.
465.65	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
465.70	0.75¢ per lb. + 14% ad val.	0.65¢ per lb. + 12.5% ad val.	0.6¢ per lb. + 11% ad val.	0.52¢ per lb. + 9.5% ad val.	0.45¢ per lb. + 8% ad val.	0.3¢ per lb. + 7% ad val.
465.75	2¢ per lb. + 14% ad val.	1.8¢ per lb. + 12.5% ad val.	1.6¢ per lb. + 11% ad val.	1.4¢ per lb. + 9.5% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.
465.80	1.5¢ per lb. + 14% ad val.	1.3¢ per lb. + 12.5% ad val.	1.2¢ per lb. + 11% ad val.	1¢ per lb. + 9.5% ad val.	0.9¢ per lb. + 8% ad val.	0.7¢ per lb. + 7% ad val.
465.85	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
465.87	16¢ per lb.	14.4¢ per lb.	12.5¢ per lb.	11¢ per lb.	9.5¢ per lb.	8¢ per lb.
465.90	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
465.92	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
465.95	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
466.05	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
466.10	1¢ per lb. + 10% ad val.	0.9¢ per lb. + 9% ad val.	0.8¢ per lb. + 8% ad val.	0.7¢ per lb. + 7% ad val.	0.6¢ per lb. + 6% ad val.	0.5¢ per lb. + 5% ad val.
466.15 1/	1¢ per lb. + 6.5% ad val.	0.9¢ per lb. + 5.5% ad val.	0.8¢ per lb. + 5% ad val.	0.7¢ per lb. + 4.5% ad val.	0.6¢ per lb. + 3.5% ad val.	0.5¢ per lb. + 3% ad val.
466.20	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.	7% ad val.
466.25	1¢ per lb. + 8.5% ad val.	0.9¢ per lb. + 7.5% ad val.	0.8¢ per lb. + 6.5% ad val.	0.7¢ per lb. + 5.5% ad val.	0.5¢ per lb. + 5% ad val.	0.5¢ per lb. + 4% ad val.
466.30	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.

1/ In accordance with general note 3(f) to Schedule XX (Geneva - 1967), the rates of duty for this item in the columns headed 1970, 1971, 1972 will become effective unless the European Economic Community and the United Kingdom do not proceed with certain reductions provided for in their respective schedules annexed to the Geneva (1967) Protocol to the GATT. If these two participants do not so proceed, the President shall so proclaim, and the rate of duty in the column headed 1969 will continue in effect unless or until the President proclaims that they have agreed so to proceed. See related footnote 1 to Kennedy Round Staged Rates at the end of schedule 4, parts 3, 4, 5, 7, 8, 9, and 13; schedule 5, part 1; schedule 6, part 2; and schedule 7, parts 2, 9, 12, and 13.

Other Amendments and Modifications

PROVISION

Part 8--Language "This part also covers certain specified prod-
hdnte 1 ucts which may or may not be surface-active agents." added. Pub. L. 89-241, Secs. 2(a), 24(e), Oct. 7, 1965, 79 Stat. 933, 938, effective date Dec. 7, 1965.

Subpt A--Headnote 2 deleted. Pub. L. 89-388, Secs. 1(f)(2), 2,
hdnte 2 April 13, 1966, 80 Stat. 110, effective date April 13, 1966.

465.05--Rates of duty for items 465.05 and 465.15 (column 1--
465.15 4.5¢ per lb. + 15% ad val.; column 2--7.5¢ per lb. + 30% ad val.) reduced by 1.5¢ per lb. Pub. L. 89-388, Secs. 1(e)(1), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966. The rates of duty for these items had been temporarily reduced by 1.5¢ per lb. by former items 907.70 and 907.71.

465.25--Rates of duty for items 465.25, 465.35, and 465.45
465.35 (column 1--3¢ per lb. + 10% ad val.; column 2--3¢
465.45 per lb. + 25% ad val.) reduced by 3¢ per lb. Pub. L. 89-388, Secs. 1(e)(2), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966. The rates of duty for these items had been temporarily reduced by 3¢ per lb. by former items 907.72, 907.73 and 907.74.

PROVISION

465.55--Rates of duty for item 465.55 (column 1--1.5¢ per lb. + 10.5% ad val.; column 2--1.5¢ per lb. + 25% ad val.) reduced by 1.5¢ per lb. Pub. L. 89-388, Secs. 1(e)(3), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966. The rates of duty for this item had been temporarily reduced by 1.5¢ per lb. by former item 907.75.

465.65--Rates of duty for item 465.65 (column 1--3¢ per lb. + 14% ad val.; column 2--3¢ per lb. + 35% ad val.) reduced by 3¢ per lb. Pub. L. 89-388, Secs. 1(e)(2), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966. The rates of duty for this item had been temporarily reduced by 3¢ per lb. by former item 907.77.

465.87--Item 465.87 added. Pub. L. 89-241, Secs. 2(a), 24(b), Oct. 7, 1965, 79 Stat. 933, 938, effective date Dec. 7, 1965.

465.92--Item 465.92 added. Pub. L. 89-241, Secs. 2(a), 24(c), Oct. 7, 1965, 79 Stat. 933, 938, effective date Dec. 7, 1965.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 2
Schedule 4,
Part 8

Statistical Notes

PROVISION	Effective date
Note 1--See Other Amendments and Modifications for clarifying language covering items 465.05-466.30	
465.05--See Other Amendments and Modifications	
465.15--See Other Amendments and Modifications	
465.25--See Other Amendments and Modifications	
465.35--See Other Amendments and Modifications	
465.45--See Other Amendments and Modifications	
465.55--See Other Amendments and Modifications	
465.65--See Other Amendments and Modifications	
465.87--See Other Amendments and Modifications 00--Estab. (transferred from 429.8000pt).....	*Dec. 7, 1965*
465.92--See Other Amendments and Modifications 00--Estab. (transferred from 799.0000pt).....	*Dec. 7, 1965*

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 9. - DYEING AND TANNING PRODUCTS; PIGMENTS AND PIGMENT-LIKE MATERIALS; INKS, PAINTS, AND RELATED PRODUCTS			
		Part 9 headnote: 1. Any product described in this part and also in part 1 of this schedule is classifiable under said part 1, except varnishes, inks, and artists', students', and children's pigments or paints.			
		Subpart A. - Dyeing and Tanning Products			
		Subpart A headnotes: 1. This subpart covers only materials, extracts, decoctions, and other preparations suitable for coloring (including dyeing and staining) or for tanning. All the products provided for are of vegetable origin except cochineal (item 470.05) which is of animal origin. 2. For the purposes of this subpart -- (a) the term "crude or processed" means materials which are crude or which have been processed by shredding, grinding, chipping, crushing, or any similar process, but not otherwise processed; and (b) the term "cutch" refers to products obtained from the Acacia catechu or Areca catechu trees.			
470.05	00	Annato, archil, cochineal, cudbear, and litmus	Lb	Free	Free
		Brazil wood, cutch, fustic, henna, logwood, madder, Persian berry, safflower, and saffron:			
470.10	00	Crude or processed	Lb	Free	Free
470.15	00	Other	Lb	4.5% ad val.	15% ad val.
		Canaigre, chestnut, curupay, divi-divi, eucalyptus, hemlock, larch, and tara:			
470.20	00	Crude or processed	Lb	Free	Free
		Other:			
470.23	00	Chestnut, divi-divi, and hemlock	Lb	3% ad val. 1/	15% ad val. 1/
470.25	00	Other	Lb	6% ad val. 1/	15% ad val. 1/
470.30	00	Gall nuts, crude or processed	Lb	Free	Free
470.40	00	Gambier	Lb	Free	Free
		Mangrove, myrobalan, oak, quebracho, sumac, urunday, and wattle:			
470.50		Crude or processed		Free	Free
	30	*Quebracho*	*Lb.*		
	40	*Wattle*	*Lb.*		
	70	*Other*	*Lb.*		
		Other:			
470.55	00	Myrobalan and sumac	Lb	4.5% ad val. 1/	15% ad val. 1/
470.57		Other		6.5% ad val. 1/	15% ad val. 1/
	40	*Quebracho*	*Lb.*		
	60	*Wattle*	*Lb.*		
	90	*Other*	*Lb.*		

1/ Duty temporarily suspended by legislation. See Appendix to Tariff Schedules.

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Valonia:			
470.60	00	Crude or processed	Lb	Free	Free
470.65	00	Other	Lb	3% ad val. 1/	15% ad val. 1/
		Products of vegetable origin used chiefly for coloring or tanning, not specially provided for:			
470.80	00	Crude or processed	Lb	Free	Free
470.85	00	Other	Lb	4.5% ad val.	15% ad val.
		Subpart B. - Pigments and Pigment-Like Materials			
		Subpart B headnote:			
		1. The term "pigments", as used in this subpart, means products consisting of fine solid particles or powder, in dry form, in pulp, or ground in or mixed with oil, water, or other vehicle, commonly known as pigments and suitable for use in imparting color (including black and white) in paints, inks, rubber, plastics, linoleum, and other products.			
		Barium carbonate:			
		Natural (witherite):			
472.02	00	Crude	Ton	Free	Free
472.04	00	Ground	Ton	10% ad val.	30% ad val.
472.06	00	Precipitated	Lb	1.65¢ per lb.	1.5¢ per lb.
		Barium sulfate:			
		Natural (barytes):			
472.10	00	Crude	Ton	$2.19 per ton	$4 per ton
472.12	00	Ground	Ton	$8.80 per ton	$17.60 per ton
472.14	00	Precipitated (blanc fixe)	Lb	0.55¢ per lb.	1.25¢ per lb.
		Calcium carbonate:			
		Natural:			
472.20	00	Chalk, crude	Ton	Free	Free
472.22	00	Chalk whiting	Lb	0.09¢ per lb.	0.44 per lb.
472.24	00	Precipitated	Lb	8.8% ad val.	25% ad val.
472.30	00	Calcium sulfate, precipitated, and satin white	Lb	0.44¢ per lb.	0.5¢ per lb.
		Iron-oxide and iron-hydroxide pigment materials, natural, if crude or washed but not ground:			
472.40	00	Ochers	Lb	0.1¢ per lb.	0.3754¢ per lb.
		Siennas:			
472.42	00	Crude	Lb	0.05¢ per lb.	0.1254¢ per lb.
472.44	00	Washed	Lb	0.1¢ per lb.	0.375¢ per lb.
		Umbers:			
472.46	00	Crude	Lb	0.05¢ per lb.	0.1254¢ per lb.
472.48	00	Washed	Lb	0.15¢ per lb.	0.375¢ per lb.
472.50	00	Other	Lb	14.5% ad val.	25% ad val.

1/ Duty temporarily suspended by legislation. See Appendix to Tariff Schedules.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 1
Schedule 4,
Part 9

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19082:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
470.15 1/	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
470.23	4% ad val.	3% ad val.	2% ad val.	1.5% ad val.	0.5% ad val.	Free
470.55	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
470.57	7.5% ad val.	6.5% ad val.	6% ad val.	5% ad val.	4% ad val.	3.5% ad val.
470.65	3.75% ad val.	3% ad val.	2% ad val.	1% ad val.	0.5% ad val.	Free
470.85 1/	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
472.04	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
472.06	1.2¢ per lb.	1.08¢ per lb.	0.96¢ per lb.	0.84¢ per lb.	0.72¢ per lb.	0.6¢ per lb.
472.10	$2.65 per ton	$2.29 per ton	$2.04 per ton	$1.78 per ton	$1.53 per ton	$1.27 per ton
472.12	$6.30 per ton	$5.83 per ton	$5.20 per ton	$4.54 per ton	$3.90 per ton	$3.25 per ton
472.14	0.625¢ per lb.	0.55¢ per lb.	0.5¢ per lb.	0.43¢ per lb.	0.35¢ per lb.	0.3¢ per lb.
472.22	0.1¢ per lb.	0.09¢ per lb.	0.08¢ per lb.	0.07¢ per lb.	0.06¢ per lb.	0.05¢ per lb.
472.24 1/	6.5% ad val.	5.5% ad val.	5% ad val.	4.5% ad val.	3.5% ad val.	3% ad val.
472.30 1/	0.5¢ per lb.	0.45¢ per lb.	0.4¢ per lb.	0.35¢ per lb.	0.3¢ per lb.	0.25¢ per lb.
472.40	0.125¢ per lb.	0.1¢ per lb.	0.1¢ per lb.	0.06¢ per lb.	0.06¢ per lb.	0.06¢ per lb.
472.42	0.0625¢ per lb.	0.05¢ per lb.	0.03¢ per lb.	0.03¢ per lb.	0.03¢ per lb.	0.03¢ per lb.
472.44	0.2¢ per lb.	0.2¢ per lb.	0.1¢ per lb.	0.15¢ per lb.	0.15¢ per lb.	0.1¢ per lb.
472.46	0.0625¢ per lb.	0.05¢ per lb.	0.03¢ per lb.	0.02¢ per lb.	0.01¢ per lb.	Free
472.48	0.1875¢ per lb.	0.15¢ per lb.	0.15¢ per lb.	0.13¢ per lb.	0.1¢ per lb.	0.09¢ per lb.
473.00	16% ad val.	14.5% ad val.	13.5% ad val.	12% ad val.	11% ad val.	10% ad val.
473.02	10% ad val.	9% ad val.	8% ad val	7% ad val.	6% ad val.	5% ad val.
473.04	5% ad val.	4% ad val.	3% ad val.	2% ad val.	1% ad val.	Free
473.06	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.10	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.12	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.14	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.16	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.18	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.19	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.40	10% ad val.	9% ad val.	8% ad val	7% ad val.	6% ad val.	5% ad val.
473.24	1.375¢ per lb. + 15% ad val.	1¢ per lb. + 13.5% ad val.	1¢ per lb. + 12% ad val.	0.84 per lb. + 10.5% ad val.	0.7¢ per lb. + 9% ad val.	0.6¢ per lb. + 7.5% ad val.
473.28 1/	3.4¢ per lb.	3¢ per lb.	2.7¢ per lb.	2.3¢ per lb.	2¢ per lb.	1.7¢ per lb.
473.30	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
473.32	0.125¢ per lb.	0.1¢ per lb.	0.1¢ per lb.	0.08¢ per lb.	0.06¢ per lb.	0.06¢ per lb.
473.36	0.25¢ per lb.	0.2¢ per lb.	0.2¢ per lb.	0.15¢ per lb.	0.13¢ per lb.	0.1¢ per lb.
473.38	0.1875¢ per lb.	0.16¢ per lb.	0.15¢ per lb.	0.13¢ per lb.	0.1¢ per lb.	0.09¢ per lb.
473.40	16% ad val.	14.5% ad val.	13.5% ad val.	12% ad val.	11% ad val.	10% ad val.
473.44	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
473.46 1/	0.6¢ per lb.	0.5¢ per lb.	0.48¢ per lb.	0.4¢ per lb.	0.3¢ per lb.	0.3¢ per lb.
473.48 1/	1¢ per lb.	0.9¢ per lb.	0.8¢ per lb.	0.7¢ per lb.	0.6¢ per lb.	0.5¢ per lb.
473.50	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
473.54	2¢ per lb.	1.8¢ per lb.	1.6¢ per lb.	1.4¢ per lb.	1.2¢ per lb.	1¢ per lb.
473.60 1/	1.05¢ per lb.	0.9¢ per lb.	0.8¢ per lb.	0.7¢ per lb.	0.6¢ per lb.	0.5¢ per lb.
473.62	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
473.66 1/	30¢ per lb.	27¢ per lb.	24¢ per lb.	21¢ per lb.	18¢ per lb.	15¢ per lb.
473.70	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
473.72	0.875¢ per lb.	0.78¢ per lb.	0.7¢ per lb.	0.6¢ per lb.	0.52¢ per lb.	0.43¢ per lb.
473.74	0.875¢ per lb. + 7.5% ad val.	0.78¢ per lb. + 6.5% ad val.	0.7¢ per lb. + 6% ad val.	0.6¢ per lb. + 5% ad val.	0.5¢ per lb. + 4.5% ad val.	0.43¢ per lb. + 3.5% ad val.
473.80	2.5¢ per lb.	2.2¢ per lb.	2¢ per lb.	1.7¢ per lb.	1.5¢ per lb.	1.2¢ per lb.
473.82	8% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.	4.5% ad val.

1/ See footnote 1 at the end of this list of Staged Rates.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 2
Schedule 4,
Part 9

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
473.84	2.125¢ per lb.	1.9¢ per lb.	1.7¢ per lb.	1.4¢ per lb.	1.2¢ per lb.	1¢ per lb.
473.86	17% ad val.	15% ad val.	13.5% ad val.	11.5% ad val.	10% ad val.	8.5% ad val.
473.88	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
473.90	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
474.02	0.75¢ per piece	0.67¢ per piece	0.6¢ per piece	0.52¢ per piece	0.45¢ per piece	0.37¢ per piece
474.04	1.4¢ per piece + 8.5% ad val.	1.2¢ per piece + 7.5% ad val.	1.1¢ per piece + 6.5% ad val.	0.9¢ per piece + 5.9% ad val.	0.8¢ per piece + 5% ad val.	0.7¢ per piece + 4% ad val.
474.06	1.25¢ per piece + 12.5% ad val.	1.1¢ per piece + 11% ad val.	1¢ per piece + 10% ad val.	0.88¢ per piece + 8.5% ad val.	0.75¢ per piece + 7% ad val.	0.62¢ per piece + 6% ad val.
474.08	24% ad val. on the entire set	21.5% ad val. on the entire set	19% ad val. on the entire set	16.5% ad val. on the entire set	14% ad val. on the entire set	12% ad val. on the entire set
474.20 1/	3% ad val.	2.5% ad val.	2% ad val.	2% ad val.	1.5% ad val.	1.5% ad val.
474.22 1/	5.5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.	2.5% ad val.
474.28 1/	3% ad val.	2.5% ad val.	2% ad val.	2% ad val.	1.5% ad val.	1.5% ad val.
474.30	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
474.35	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
474.40	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
474.42	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
474.44	12¢ per lb.	10.5¢ per lb.	9.5¢ per lb.	8¢ per lb.	7¢ per lb.	6¢ per lb.
474.46	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
474.50	8.5% ad val.	7.5% ad val.	6.5% ad val.	5.5% ad val.	5% ad val.	4% ad val.
474.60 1/	0.25¢ per lb.	0.2¢ per lb.	0.2¢ per lb.	0.15¢ per lb.	0.16¢ per lb.	0.1¢ per lb.
474.62	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.

1/ In accordance with general note 3(f) to Schedule XX (Geneva - 1967), the rates of duty for this item in the columns headed 1970, 1971, 1972 will become effective unless the European Economic Community and the United Kingdom do not proceed with certain reductions provided for in their respective schedules annexed to the Geneva (1967) Protocol to the GATT. If these two participants do not so proceed, the President shall so proclaim, and the rate of duty in the column headed 1969 will continue in effect unless or until the President proclaims that they have agreed so to proceed. See related footnote 1 to Kennedy Round Staged Rates at the end of schedule 4, parts 3, 4, 5, 7, 8, 9, and 13; schedule 5, part 1; schedule 6, part 2; and schedule 7, parts 2, 9, 12, and 13.

Other Amendments and Modifications

PROVISION

Subpt B--Language "chiefly used to impart color" deleted and
hdnte 1 language "commonly known as pigments and suitable for use in imparting color" inserted in lieu thereof. Pub. L. 89-241, Secs. 2(a), 26, Oct. 7, 1965, 79 Stat. 933, 939, effective date Dec. 7, 1965.

PROVISION

472.50--Column 1 rate of duty of 18% ad val. reduced to 16% ad val. on Jan. 1, 1964. General headnote 3(g).

475.40--Column 1 rate of duty of 18% ad val. reduced to 16% ad val. on Jan. 1, 1964. General headnote 3(g).

Statistical Notes

PROVISION	Effective date
470.23--See Amendments and Modifications (item 907.80)	
470.25--See Amendments and Modifications (item 907.80)	
470.50--	
20--Disc.(transferred to 470.5070)...........	*Jan. 1, 1966*
60--Disc.	*do*
70--Estab.(transferred from 470.5020 & 60)....	*do*
470.55--See Amendments and Modifications (item 907.80)	
470.57--See Amendments and Modifications (item 907.80)	
20--Disc.(transferred to 470.5790)...........	*Jan. 1, 1966*
80--Disc.	*do*
90--Estab.(transferred from 470.5720 & 80)....	*do*
470.65--See Amendments and Modifications (item 907.80)	

Subpt. B,
hdnte. 1--See Other Amendments and Modifications for clarifying language covering items 472.02-473.00

472.50--See Other Amendments and Modifications

4[illegible]--See Other Amendments and Modifications

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		PART 13. - FATTY SUBSTANCES, CAMPHOR, CHARS AND CARBONS, ISOTOPES, WAXES, AND OTHER PRODUCTS			
		Part 13 headnote:			
		1. Any product described in this part and also in part 1 of this schedule is classifiable under the said part 1, except any product provided for in item 493.10, 493.75, 494.50, 494.52, or 494.60, and except any product provided for in subpart C of this part.			
		Subpart A. - Fatty Substances			
490.05	00	Fats, oils, and greases, all the foregoing, of animal (including marine animal) or vegetable origin, which have been halogenated, nitrated, or vulcanized	lb.	16% ad val.	20% ad val.
		Fatty substances, not sulfonated or sulfated, and not specially provided for:			
		Fatty acids:			
		Of animal (including marine animal) origin:			
490.10	00	Oleic acid	lb.	2.7¢ per lb. + 9% ad val.	3¢ per lb. + 20% ad val.
490.12	00	Stearic acid	lb.	2.7¢ per lb. + 11% ad val.	3¢ per lb. + 25% ad val.
490.14	00	Other	lb.	1.3¢ per lb. + 9% ad val.	3¢ per lb. + 20% ad val.
		Of vegetable origin:			
490.20	00	Derived from linseed oil	lb.	4¢ per lb. + 9% ad val.	4.5¢ per lb. + 20% ad val.
490.22	00	Derived from hempseed, kapot, perilla, rapeseed, sesame, or sunflower oil	lb.	2¢ per lb. + 9% ad val.	4.5¢ per lb. + 20% ad val.
490.24	00	Derived from coconut, palm-kernel, or palm oil	lb.	9% ad val.	20% ad val.
490.26	00	Other	lb.	9% ad val.	20% ad val.

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Subpart B. - Camphor, Chars and Carbons, Isotopes, Waxes, and Other Products			
		Subpart B headnote: 1. For the purposes of this part -- (a) the term "crude", in items 493.02, 493.20, and 493.35, has the same meaning as is given for that term in headnote 3(c) of part 3 of this schedule, and (b) the term "advanced" in items 493.04, 493.21, and 493.36, has the same meaning as is given for that term in headnote 3(d) in part 3 of this schedule.			
		Barbasco or cube root, and derris, tuba or tuba root:			
493.02	00	Crude	Lb.	Free	Free
493.04	00	Advanced	Lb.	0.5% ad val.	10% ad val.
493.10	00	Blackings, powders, liquids, and creams for polishing and cleaning, all the foregoing in immediate containers holding not over 10 pounds each	%	5% ad val.	25% ad val.
		Casein and mixtures in chief value thereof:			
493.15	00	Casein	Lb.	Free	Free
493.16	00	Other	Lb.	2.4¢ per lb.	5.5¢ per lb.
493.18	00	Cellulose compounds, not specially provided for	Lb.	14.4¢ per lb.	45¢ per lb.
		Camphor:			
		Natural:			
493.20	00	Crude	Lb.	0.4¢ per lb.	1¢ per lb.
493.21	00	Advanced	Lb.	2.5¢ per lb.	5¢ per lb.
493.22	00	Synthetic	Lb.	4.5¢ per lb.	9¢ per lb.
		Chars and carbons:			
493.25	00	Bone char	Lb.	10% ad val.	30% ad val.
493.26	00	Decolorizing and gas or vapor absorbing chars and carbons, whether or not activated	Lb.	15% ad val.	45% ad val.
493.30	00	Dextrins and soluble or chemically treated starches	Lb.	1.125¢ per lb. 1/	3¢ per lb.
493.35	00	Fibrin	Lb.	Free	Free
493.40	00	Mineral salts obtained by evaporation from the waters of a designated mineral spring	Lb.	Free	Free
493.42	00	Preparations containing over 50 percent by weight of monosodium glutamate	%	10% ad val.	25% ad val.
		Pitch:			
493.45	00	Burgundy	Lb.	Free	Free
493.46	00	Marine glue	Lb.	14% ad val.	20% ad val.
493.47	00	Wood	Lb.	0.45¢ per lb.	1¢ per lb.
493.50	00	Products chiefly used as assistants in preparing or finishing textiles, not specially provided for	Lb.	11% ad val.	25% ad val.
		Pyrethrum or insect flowers:			
493.55	00	Crude	Lb.	Free	Free
493.56	00	Advanced	Lb.	2% ad val.	10% ad val.

1/ Rate temporarily increased by proclamation. See Appendix to Tariff Schedules.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

STAGED RATES AND HISTORICAL NOTES

Notes p. 1
Schedule 4,
Part 13

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 3822 (Kennedy Round), Dec. 16, 1967, 32 F.R. 19001:

TSUS item	Prior rate	Rate of duty, effective with respect to articles entered on and after January 1 --				
		1968	1969	1970	1971	1972
490.10	5¢ per lb. + 10% ad val.	4.7¢ per lb. + 9% ad val.	2.4¢ per lb. + 8% ad val.	2¢ per lb. + 7% ad val.	1.8¢ per lb. + 6% ad val.	1.5¢ per lb. + 5% ad val.
490.12	3¢ per lb. + 12.5% ad val.	2.7¢ per lb. + 11% ad val.	2.4¢ per lb. + 10% ad val.	2.1¢ per lb. + 8.5% ad val.	1.8¢ per lb. + 7% ad val.	1.5¢ per lb. + 6% ad val.
490.14	1.5¢ per lb. + 10% ad val.	1.3¢ per lb. + 9% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.	0.9¢ per lb. + 6% ad val.	0.7¢ per lb. + 5% ad val.
490.20	4.5¢ per lb. + 10% ad val.	4¢ per lb. + 9% ad val.	3.6¢ per lb. + 8% ad val.	3¢ per lb. + 7% ad val.	2.5¢ per lb. + 6% ad val.	2.2¢ per lb. + 5% ad val.
490.24	2.25¢ per lb. + 10% ad val.	2¢ per lb. + 9% ad val.	1.8¢ per lb. + 8% ad val.	1.5¢ per lb. + 7% ad val.	1.3¢ per lb. + 6% ad val.	1.1¢ per lb. + 5% ad val.
490.24	13% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
490.26	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
490.30	1.5¢ per lb. + 10% ad val.	1.3¢ per lb. + 9% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.	0.9¢ per lb. + 6% ad val.	0.7¢ per lb. + 5% ad val.
490.32	1.5¢ per lb. + 10% ad val.	1.3¢ per lb. + 9% ad val.	1.2¢ per lb. + 8% ad val.	1¢ per lb. + 7% ad val.	0.9¢ per lb. + 6% ad val.	0.7¢ per lb. + 5% ad val.
490.40	7.2¢ per lb.	6.5¢ per lb.	5.8¢ per lb.	5¢ per lb.	4.3¢ per lb.	3.6¢ per lb.
490.42	4.25¢ per lb. + 15% ad val.	4¢ per lb. + 13.5% ad val.	1.8¢ per lb. + 12% ad val.	1.5¢ per lb. + 10.5% ad val.	1.3¢ per lb. + 9% ad val.	1¢ per lb. + 7.5% ad val.
490.44	2.25¢ per lb. + 10% ad val.	2¢ per lb. + 9% ad val.	1.8¢ per lb. + 8% ad val.	1.5¢ per lb. + 7% ad val.	1.3¢ per lb. + 6% ad val.	1.1¢ per lb. + 5% ad val.
490.46	2.25¢ per lb. + 10% ad val.	2¢ per lb. + 9% ad val.	1.8¢ per lb. + 8% ad val.	1.5¢ per lb. + 7% ad val.	1.3¢ per lb. + 6% ad val.	1¢ per lb. + 5% ad val.
490.48	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
490.50	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
490.65	2.5¢ per lb. + 12.5% ad val.	2.2¢ per lb. + 11% ad val.	2¢ per lb. + 10% ad val.	1.7¢ per lb. + 8.5% ad val	1.5¢ per lb. + 7% ad val.	1.2¢ per lb. + 6% ad val.
490.73	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
490.75	10.5% ad val.	9% ad val.	8% ad val	7% ad val	6% ad val	5% ad val.
490.90	0.75¢ per lb. + 10.5% ad val.	0.65¢ per lb. + 9% ad val.	0.6¢ per lb. + 8% ad val.	0.5¢ per lb. + 7% ad val.	0.4¢ per lb. + 6% ad val.	0.3¢ per lb. + 5% ad val.
490.93	10.5% ad val.	9% ad val.	8% ad val.	7% ad val	6% ad val.	5% ad val
490.94	10.5% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.
491.00	10.5% ad val., but not less than the highest rate applicable to any component	9% ad val., but not less than the highest rate applicable to any component	8% ad val., but not less than the highest rate applicable to any component	7% ad val., but not less than the highest rate applicable to any component	6% ad val., but not less than the highest rate applicable to any component	5% ad val., but not less than the highest rate applicable to any component
493.04	1% ad val.	0.5% ad val.	0.5% ad val.	Free	Free	Free
493.10	6% ad val.	5% ad val.	4.5% ad val.	4% ad val.	3.5% ad val.	3% ad val.
493.16	.75¢ per lb.	.2 4¢ per lb.	2¢ per lb.	1.9¢ per lb.	1.5¢ per lb.	1.3¢ per lb.
493.18	16¢ per lb.	14.4¢ per lb.	12.8¢ per lb.	11¢ per lb.	9.6¢ per lb.	8¢ per lb.
493.20 1/	0.3¢ per lb.	0.4¢ per lb.	0.4¢ per lb.	0.2¢ per lb.	0.2¢ per lb.	0.2¢ per lb.
493.21 1/	3¢ per lb.	2.5¢ per lb.	2.4¢ per lb.	2¢ per lb.	1.5¢ per lb.	1.5¢ per lb.
493.22	5¢ per lb.	4.5¢ per lb.	4¢ per lb.	3.5¢ per lb.	3¢ per lb.	2.5¢ per lb.
493.25	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
493.34	15% ad val.	13% ad val.	12% ad val.	10% ad val.	9% ad val.	7.5% ad val.
493.46	16% ad val.	14% ad val.	12.5% ad val.	11% ad val.	9.5% ad val.	8% ad val.
493.47 1/	0.5¢ per lb.	0.45¢ per lb.	0.4¢ per lb.	0.35¢ per lb.	0.3¢ per lb.	0.25¢ per lb.
493.50	12.5% ad val.	11% ad val.	10% ad val.	8.5% ad val.	7% ad val.	6% ad val.
493.56	2.5% ad val.	2% ad val.	1% ad val.	1% ad val.	Free	Free
493.65	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
493.66	40% ad val.	36% ad val.	32% ad val.	28% ad val.	24% ad val.	20% ad val.
493.67	17.5% ad val.	15.5% ad val.	14% ad val.	12% ad val.	10% ad val.	8.5% ad val.
493.68	20% ad val.	18% ad val.	16% ad val.	14% ad val.	12% ad val.	10% ad val.
493.82	10% ad val.	9% ad val.	8% ad val.	7% ad val.	6% ad val.	5% ad val.

1/ See footnote 1 at the end of this list of Staged Rates.

APPENDIX TO THE TARIFF SCHEDULES

Appendix Headnotes:

1. The provisions of this Appendix relate to legislation and to executive and administrative actions pursuant to duly constituted authority, under which --

(a) one or more of the provisions in schedules 1 through 8 are temporarily amended or modified, or

(b) additional duties or other import restrictions are imposed by, or pursuant to, collateral legislation.

2. Unless the context requires otherwise, the general headnotes and rules of interpretation and the respective schedule, part, and subpart headnotes in schedules 1 through 8 apply to the provisions of this Appendix.

Appendix statistical headnotes:

1. For statistical reporting of merchandise provided for herein --

(a) unless more specific instructions appear in the parts or subparts of this appendix, report the 5-digit item number (or 7-digit number, if any) found in the appendix in addition to the 7-digit number appearing in schedules 1-7 which would be applicable but for the provisions of this appendix; and

(b) the quantities reported should be in the units provided in schedules 1-7.

2. For those items herein for which no rate of duty appears (i.e., those items for which an absolute quota is prescribed), report the 5-digit item number herein followed by the appropriate 7-digit reporting number from schedules 1-7. The quantities reported should be in the units provided in schedules 1-7.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

APPENDIX TO THE TARIFF SCHEDULES
Part 1. - Temporary Legislation

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2	Effective Period
		Subpart B. - Temporary Provisions Amending the Tariff Schedules				
		Subpart B headnotes: ❶ 1. Any article described in the provisions of this subpart, if entered during the period specified in the last column, is subject to duty at the rate set forth herein in lieu of the rate provided therefor in schedules 1 to 8, inclusive. ❶ 2. Articles exempted under item 915.25 from the payment of duty shall be exempt also from the payment of any internal revenue tax imposed upon or by reason of importation.				
		Subpart B statistical headnotes: *1. For the purpose of statistical reporting of any item for which a unit of quantity (including X) appears in this subpart no additional reporting number (from schedules 1-7) is to be furnished.* *2. No statistical reporting information for item 915.25 is required.*				
903.20 903.21	1/ 1/	Chicory roots (provided for in part 11A, schedule 4): Crude (item 160.30)..... Ground or otherwise prepared (item 160.35).....	1/ 1/	3.5¢ 2¢ per lb.	Free 2¢ per lb.	On or before 6/30/69
		1/ See Appendix statistical headnote 1.				
						(1st supp. 3/15/68)

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2	Effective Period
903.90	1/	Istle, processed (provided for in item 192.70, part 15C, schedule 1).....	1/	Free	Free	On or before 9/3/68
		Yarns, wholly of noncontinuous silk fibers (provided for in part 1D, schedule 3):				
905.30	1/	Singles, not bleached and not colored, measuring over 58,800 yards per pound (item 308.40)	1/	Free	Free	On or before 11/7/68
905.31	1/	Plied, not bleached and not colored, measuring over 29,400 yards per pound (item 308.50 and item 308.51)	1/	Free	Free	
907.15	00	Aluminum oxide (alumina) (provided for in item 417.12, part 2C, schedule 4) when imported for use in producing aluminum.....	ton ...	Free	Free	On or before 7/15/68
907.30	00	Heptanoic acid (provided for in item 425.98, part 2D, schedule 4).....	lb. ...	Free	Free	On or before 8/8/69
907.80	1/	Canaigre, chestnut, curupay, divi-divi, eucalyptus, hemlock, larch, tara, mangrove, myrobalan, oak, quebracho, sumac, urunday, wattle, and valonia, all the foregoing provided for in items 470.23, 470.25, 470.55, 470.57, and 470.65, part 9A, schedule 4.....	1/	Free	Free	On or before 9/30/69
909.25	00	Electrodes (provided for in item 517.61, part 4E, schedule 5) when imported for use in producing aluminum.....	S. ton..	Free	Free	On or before 7/15/68
909.30	1/	Bauxite, calcined (provided for in item 521.17, part 1J, schedule 5).....	1/	Free	Free	On or before 7/15/68
911.05	1/	Bauxite ore (provided for in item 601.06, part 1, schedule 6).....	1/	Free	Free	On or before 7/15/68
911.07		Manganese ore, including ferruginous manganese ore, and manganiferous iron ore, all the foregoing containing over 10 percent by weight of manganese (provided for in item 601.17, part 1, schedule 6).....	.....	Free	1¢ per lb. on manganese content	On or before 9/30/70
	20	*Containing under 35% by weight of manganese*.....	*lb. manganese content..*	*lb.*		
	40	*Containing 35% or over, but less than 47% by weight of manganese*.....	*lb. manganese content..*	*lb.*		
	80	*Containing 47% or more by weight of manganese*.....	*lb. manganese content..*	*lb.*		

1/ See Appendix statistical headnote 1.

TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1968)

HISTORICAL NOTES

Notes p. 1
Appendix,
Part 1

Amendments and Modifications

PROVISION

901.00--Tax termination date extended from June 30, 1967 to June 30, 1972. Pub. L. 89-331, Secs. 13, 14, Nov. 8, 1965, 79 Stat. 1280, 1281.

Subpt B--Reference to item 915.25 added. Pub. L. 89-368, Secs.
hdnte 2 303(b), (c), March 15, 1966, 80 Stat. 71, effective date March 16, 1966.

Headnote 2 deleted. Pub. L. 89-436, Secs. 1(b), (c), May 31, 1966, 80 Stat. 189, effective date July 1, 1966.

1 New headnote 2 added. Pub. L. 90-240, Secs. 1(b), 2, Jan. 2, 1968, 81 Stat. 776, effective date Jan. 1, 1968.

903.20--Effective period extended from June 30, 1966 to June 30,
903.21 1969. Pub. L. 89-430, May 31, 1966, 80 Stat. 191.

903.30--Items 903.30, 903.31, and 903.32 (Copra); item 903.40
903.31 (Palm-nut kernels and palm nuts); items 903.43, 903.44,
903.32 903.45, 903.46, 903.47, 903.48, and 903.49 (Coconut oil);
903.40 items 903.60 and 903.61 (Palm-kernel oil); item 903.65
903.43 (Palm oil); and headings immediately preceding such items
903.44 deleted. Pub. L. 89-368, Secs. 1(g), 2, April 13, 1966,
903.45 80 Stat. 110, effective date April 13, 1966.
903.46
903.47
903.48
903.49
903.60
903.61
903.65

903.90--Effective period extended from Sept. 5, 1966 to Sept. 5, 1969. Pub. L. 89-575, Secs. 1(a), (b), Sept. 13, 1966, 80 Stat. 771, effective date Sept. 5, 1966.

904.40--Item 904.40 (Insulation of compressed cork) deleted. Pub. L. 89-431, Secs. 1(b), 2, May 24, 1966, 80 Stat. 168, 169, effective date May 27, 1966.

905.30--Effective period extended from Nov. 7, 1965 to Nov. 7, 1968.
905.31 Pub. L. 89-429, Sec. 1, Oct. 1, 1965, 79 Stat. 901.

907.15--Effective period extended from July 15, 1964 to July 15, 1966. Pub. L. 88-362, July 7, 1964, 78 Stat. 298.

Effective period extended from July 15, 1966 to July 15, 1968. Pub. L. 89-440, May 31, 1966, 80 Stat. 192.

907.30--Effective period extended from Aug. 8, 1966 to Aug. 8, 1969. Pub. L. 89-432, May 31, 1966, 80 Stat. 169.

907.70--Items 907.70, 907.71, 907.72, 907.73, 907.74, and 907.75
907.71 (Fatty substances derived from coconut, palm-kernel, or
907.72 palm oil) and headings immediately preceding items 907.70
907.73 and 907.73 deleted. Pub. L. 89-368, Secs. 1(g), 2,
907.74 April 13, 1966, 80 Stat. 110, effective date April 13,
907.75 1966.

907.77--Column 1 rate of duty of 17.5% ad val. reduced to 14% ad val. Pub. L. 89-241, Secs. 2(a), 86, Oct. 7, 1965, 79 Stat. 933, 950, effective date Dec. 7, 1965.

Item 907.77 (Coconut, palm-kernel, and palm oils) deleted. Pub. L. 89-368, Secs. 1(g), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966.

PROVISION

907.80--Effective period extended from Sept. 30, 1966 to Sept. 30, 1969. Pub. L. 89-575, Sept. 13, 1966, 80 Stat. 765.

907.85--Items 907.85, 907.86, 907.87, and 907.88 (Fatty
907.86 substances derived from coconut, palm-kernel, or
907.87 palm oil) and heading preceding item 907.87 deleted.
907.88 Pub. L. 89-368, Secs. 1(g), 2, April 13, 1966, 80 Stat. 110, effective date April 13, 1966.

909.20--Effective period extended from June 30, 1964 to June 30, 1966. Pub. L. 88-329, June 29, 1964, 78 Stat. 225, 226.

Item 909.20 deleted. Pub. L. 89-433, Secs. 1(b), (c), May 31, 1966, 80 Stat. 169, effective date July 1, 1966.

909.25--Item 909.25 added. Pub. L. 89-241, Secs. 87(a), (b), Oct. 7, 1965, 79 Stat. 950, effective date Oct. 8, 1965.

Effective period extended from July 15, 1966 to July 15, 1968. Pub. L. 89-434, May 31, 1966, 80 Stat. 189.

909.30--Effective period extended from July 15, 1964 to
911.05 July 15, 1966. Pub. L. 88-303, July 7, 1964, 78 Stat. 208.

Effective period extended from July 15, 1966 to July 15, 1968. Pub. L. 89-440, May 31, 1966, 80 Stat. 192.

911.07--Item 911.07 added. Pub. L. 88-328, Secs. 1(a), (b), June 30, 1964, 78 Stat. 232, effective date July 1, 1964.

Effective period extended from June 30, 1967 to June 30, 1970. Pub. L. 90-49, Secs. 1(a), (b), July 7, 1967, 81 Stat. 119, effective date July 1, 1967.

911.10--Effective period for items 911.10, 911.11, and 911.12
911.11 extended from June 30, 1964 to June 30, 1969. Pub.
911.12 L. 88-324, June 29, 1964, 78 Stat. 222.

Effective period for items 911.10, 911.11, and 911.12 extended from June 30, 1965 to June 30, 1967. Pub. L. 89-61, June 30, 1965, 79 Stat. 207.

Item 911.10 amended by deleting in column 1-a "1.7¢ per lb. on 99.6% of copper content" and adding "Free" in lieu thereof; by deleting in columns 1-b and 2 "2¢ per lb. on 99.6% of copper content" and "4¢ per lb. on 99.6% of copper content", respectively, and adding "No change" in lieu thereof; and by extending the effective period from June 30, 1967 to June 30, 1968. Pub. L. 89-465, Secs. 1(a), (b), 2, June 23, 1966, 80 Stat. 218, 219, effective date Feb. 9, 1966.

(Int supp. 2/15/68)

A P P E N D I X B

Value of U.S. imports for consumption, by TSUS items included in the individual summaries of this volume, total and from the 3 principal suppliers, 1967.

Value of U.S. imports for consumption, for TSUS items covered by each summary in this volume, total and from the three countries that are the principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Agar (p. 7)								
455.02	2,207	+61	Morocco	1,548	Spain	293	Japan	267
Pectin (p. 11)								
455.04	399	+28	Denmark	299	Netherlands	75	W. Germany	21
Isinglass (p. 17)								
455.06	36	-16	U. Kingdom	34	Japan	1	Taiwan	1
Glue Stock (p. 21)								
455.08	4,160	- 9	Argentina	1,883	Brazil	1,199	India	733
455.10	839	+48	Canada	261	Colombia	132	Argentina	96
455.12	3,422	+37	Belgium	2,875	France	547	-	-
455.14	789	+111	Brazil	204	Argentina	108	Italy	85
Refined gelatin (p. 31)								
455.16	692	+36	U. Kingdom	546	France	57	Canada	25
455.18	4,251	+10	U. Kingdom	1,536	Belgium	1,102	France	856
455.20	5	-85	Italy	4	W. Germany	1	France	1/
455.22	1,260	-11	France	831	U. Kingdom	208	Belgium	163
455.24	315	+232	Belgium	231	France	48	Netherlands	28
Vegetable glue (p. 39)								
455.30	38	+1,016	Netherlands	21	W. Germany	16	Canada	1
455.32	1	-64	Switzerland	1/	U. Kingdom	1/	-	-
Casein glue (p. 43)								
455.34	13	-34	W. Germany	11	Netherlands	2	-	-
Fish glue (p. 49)								
455.36	252	+10	Canada	203	U. Kingdom	28	France	12
455.38	-	-	-	-	-	-	-	-
Animal glue (p. 53)								
455.40	3,984	+11	W. Germany	1,635	Netherlands	827	U. Kingdom	631
455.42	20	+43	Colombia	11	W. Germany	6	U. Kingdom	3
Glue size (p. 61)								
455.44	21	+43	India	11	W. Germany	5	U. Kingdom	4
455.46	1	+53	U. Kingdom	1	-	-	-	-
Floral essences obtained by enfleurage, maceration, or extraction (p. 65)								
460.05	3,337	-5	France	2,582	Switzerland	593	Yugoslavia	77
Natural perfume fixatives (p. 69)								
460.10	62	+99	France	17	New Zealand	16	Portugal	11
460.20	4	-47	Canada	4	-	-	-	-
460.30	154	-20	France	76	Ethiopia	72	Spain	4
460.60	48	-56	India	40	W. Germany	7	Netherlands	1

See footnotes at end of table.

Value of U.S. imports for consumption, for TSUS items covered by each summary in this volume, total and from the three countries that are the principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Aromatic and odoriferous substances and mixtures (p. 77)								
460.15	-	-	-	-	-	-	-	-
460.25	10	+275	U. Kingdom	10	-	-	-	-
460.35	20	+58	Switzerland	8	France	6	Japan	6
460.45	25	+86	U. Kingdom	13	Switzerland	7	Netherlands	3
460.50	6	-50	Netherlands	3	Canada	2	W. Germany	1
460.55	11	+15	U. Kingdom	8	Switzerland	2	France	1
460.65	10	+22	France	10	-	-	-	-
460.70	7	2/	Netherlands	5	France	1	Taiwan	1
460.75	-	-	-	-	-	-	-	-
460.80	1,281	+14	U. Kingdom	353	France	275	Switzerland	245
460.85	9,112	+33	Switzerland	4,092	France	3,745	U. Kingdom	521
460.90	639	+82	France	492	Switzerland	89	U. Kingdom	57
Cosmetics and toilet preparations (p. 85)								
461.05	4	-9	W. Germany	1	France	1	Japan	1
461.10	32	-37	U. Kingdom	16	W. Germany	11	Japan	3
461.15	8	-53	Denmark	2	U. Kingdom	2	W. Germany	2
461.40	3,120	+15	France	1,150	W. Germany	504	U. Kingdom	332
461.45	602	+46	France	317	Japan	91	Canada	65
Perfumes, toilet waters, and floral waters (p. 99)								
461.20	13	-25	Lebanon	7	France	6	-	-
461.30	128	+162	France	100	U. Kingdom	11	Spain	11
461.35	8,349	-8	France	7,101	Spain	465	W. Germany	433
Nonbenzenoid surface-active agents and textile assistants (p. 109)								
465.05	45	+207	W. Germany	23	U. Kingdom	13	Japan	8
465.10	309	+41	W. Germany	126	U. Kingdom	62	Netherlands	53
465.15	71	+49	W. Germany	57	Switzerland	13	U. Kingdom	1
465.20	96	+113	Denmark	41	W. Germany	18	France	14
465.35	46	+47	U. Kingdom	35	Belgium	10	W. Germany	1
465.40	11	+74	Norway	9	Australia	1	Japan	1
465.45	384	+10	W. Germany	168	U. Kingdom	156	Japan	57
465.50	58	+31	France	43	W. Germany	10	U. Kingdom	3
465.55	4	-80	W. Germany	4	U. Kingdom	1/	-	-
465.60	23	-1	W. Germany	15	Switzerland	6	U. Kingdom	1
465.65	-	3/	-	-	-	-	-	-
465.70	-	-	-	-	-	-	-	-
465.75	-	3/	-	-	-	-	-	-
465.80	2	-11	Canada	2	-	-	-	-
465.85	22	+132	Switzerland	14	W. Germany	5	France	3
465.87	11	-58	U. Kingdom	8	W. Germany	3	Japan	1/
465.90	48	+3,067	Canada	28	Japan	20	-	-
465.95	1,420	-8	Canada	1,116	Nicaragua	115	Belgium	106
493.50	1,894	-22	Switzerland	800	W. Germany	378	U. Kingdom	302
Lignin sulfonates (p. 117)								
465.92	778	+70	Canada	535	Netherlands	202	Norway	29
Soap (p. 121)								
466.05	32	+277	Nigeria	20	Japan	8	Italy	3
466.10	14	-50	Italy	7	Japan	4	India	2
466.15	1,497	-6	Spain	584	France	281	U. Kingdom	278
466.20	1	2/	W. Germany	1	-	-	-	-
466.25	131	-23	U. Kingdom	90	Canada	30	Switzerland	3

See footnotes at end of table.

Value of U.S. imports for consumption, for TSUS items covered by each summary in this volume, total and from the three countries that are the principal suppliers, 1967

(In thousands of dollars. The dollar value of imports shown is defined generally as the market value in the foreign country and therefore excludes U.S. import duties, freight, and transportation insurance)

Summary title and page; TSUS item	All countries		First supplier		Second supplier		Third supplier	
	Amount in 1967	Percent change from 1966	Country	Value	Country	Value	Country	Value
Synthetic detergents (nonbenzenoid formulations) (p. 133)								
466.30	110	+112	W. Germany	47	U. Kingdom	46	Canada	11
Natural dyeing materials (p. 137)								
470.05	119	-45	Spain	28	Peru	26	India	18
470.10	390	+6	Spain	281	France	57	Italy	20
470.15	138	+9	Jamaica	95	France	25	Italy	7
Natural tanning materials (p. 147)								
470.20	352	-65	Australia	225	Peru	56	Colombia	29
470.23	2,067	-17	Canada	894	France	631	Italy	514
470.25	208	-17	Australia	196	France	8	Italy	3
470.30	219	-46	Iraq	84	Turkey	70	Lebanon	51
470.40	-	-	-	-	-	-	-	-
470.50	1,278	-18	Argentina	549	Rep. So. Af.	365	Paraguay	101
470.55	111	+10	U. Kingdom	67	Australia	36	India	5
470.57	6,564	-12	Argentina	4,033	Rep. So. Af.	947	Paraguay	926
470.60	59	+31	Turkey	46	Dom. Rep.	13	-	-
470.65	42	-7	Turkey	41	W. Germany	1	-	-
470.80	883	+14	Peru	281	Dom. Rep.	271	Ecuador	117
470.85	292	+15	Italy	251	Bermuda	20	U. Kingdom	8

1/ Less than $500.
2/ No imports in 1966.
3/ No imports in 1967.

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