

Carbon Black

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Carbon black shipments continued their long-term growth pattern in 1972 by increasing 8.0%, following a 6.1% rise in 1971.

Production was a record 3,201 million pounds. Exports continued their decline to a low level of 111 million pounds. A 10.3% gain in domestic sales was one factor that resulted in yearend producer's stocks being 58 million pounds below the 1971 level. The rubber industry continued to be the leading user of carbon black. In 1972, U.S. passenger tire production increased 4% to 195.3 million tires, according to preliminary figures of the Rubber Manufacturers Association, Inc.

The carbon black industry operated at 76.6% capacity in 1972. Daily plant capacity increased 7.2% to a record 11.4 million pounds per day.

Overall production of carbon black in 1972 topped that of the preceding year by 184 million pounds. Channel-black output dropped 24 million pounds.

As shown in table 1, the average value of carbon black at the plant in 1972 was 7.76 cents per pound, an increase of 0.07 cents per pound over that of the previous year.

The volume of natural gas used for manufacturing carbon black declined 9.8 billion cubic feet. Yield also declined from 5.06 pounds per thousand cubic feet in 1971 to 5.02 pounds per thousand cubic feet in 1972. Liquid hydrocarbons feedstocks increased 43 million gallons to a total of 591 million gallons. Average yield increased slightly from 4.92 to 4.96 pounds per gallon.

PRODUCTION AND CAPACITY

Production by State.—Production of carbon black totaled 3,201 million pounds in 1972, an increase of 184 million pounds, 6.1% above the previous year's total. Louisiana supplied 33.7% of the total. Texas' share of the national total was 44.5%. The seven States that produced the remaining 21.8% of carbon black were Alabama, Arkansas, California, Kansas, Ohio, Oklahoma, and West Virginia.

Production by Grade and Type.—Although carbon black was produced by both the channel and furnace processes, the latter accounted for 99.3% of 1972 production. There are seven major grades of carbon black plus thermal black produced by the furnace process. Two of these grades, SRF (Semireinforcing-furnace) and HMF (High-modulus furnace), are gas furnace blacks. The remaining five grades are oil furnace blacks. The HAF

(High-abrasion furnace) and ISAF (Intermediate-abrasion furnace) grades continued to lead in the production of oil furnace blacks.

Number and Capacity of Plants.—The total number of producing carbon black plants was 34, three less than in the previous year. In terms of capacity, however, there was an increase from 10.6 million to 11.4 million pounds per day. As shown in table 4, plants in Texas and Louisiana accounted for the major share of the increase in daily capacity.

J. M. Huber Corp. started construction to double its thermal black production capacity to 50 million pounds per year at Borger, Tex.

Materials Used and Yields.—In 1972, a total of 590.8 million gallons of liquid hy-

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drocarbons was consumed in the manufacture of 2,930 million pounds of carbon black. This quantity was 43.1 million gallons more than was consumed in 1971. Yields from liquid hydrocarbons in 1972 averaged 4.96 pounds per gallon, compared with 4.92 pounds in 1971. The yield from

natural gas dropped to 5.02 pounds from 5.06 pounds per thousand cubic feet. Natural gas feedstock continued to decrease to 53.9 billion cubic feet, and production from natural gas declined to 271 million pounds, 51.5 million pounds below the 1971 level.

CONSUMPTION AND USES

Domestic sales of carbon black increased 10.3% to 3,147 million pounds. Rubber industry consumption increased 10.3% to 2,954 million pounds and accounted for 93.9% of the U.S. total. Sales for use in the manufacture of ink increased 9.7% to 82.5 million pounds. The oil-furnace-type carbon black, known as "Short Ink," was used in manufacturing ink for printing newspapers. Carbon black produced by the

channel process, known as "Long Ink," was used in lithographic or halftone printing ink. Consumption of carbon black in paint manufacturing had the greatest increase, 14.5%. The volume of carbon black used in paints increased to 21.4 million pounds. Miscellaneous uses, including chemical, food, and plastics, increased 9.1% to 84.8 million pounds.

STOCKS

Inventory of carbon black at yearend 1972 was 238 million pounds, 19.7% less than comparable yearend stocks in 1971. Largest contributor to the decline was thermal black inventories, which declined from 68 million to 17 million pounds. HAF and SAF were the only grades of fur-

nace blacks that had significantly higher yearend 1972 stocks than at yearend 1971. Respectively, these stocks were 14.6 million and 1.0 million pounds higher. Inventory of channel black at yearend 1972 was 7.7 million pounds, 2.0 million pounds less than yearend 1971 stocks.

FOREIGN TRADE

Carbon black exports totaled 111.3 million pounds, a decrease of 51.9 million pounds from the 1971 total. Value of exports totaled \$14.9 million, \$5.5 million less than the value of 1971 exports. Furnace black accounted for 89% of exports.

Leading recipients of carbon black produced in the United States were Canada, 19.7 million pounds; Netherlands, 16.0 million pounds; France, 13.8 million pounds; and Japan, 8.0 million pounds. These four countries accounted for approximately one-half of U.S. exports.

Most carbon black imported into the United States was specialty grades. Total imported volume was 7.24 million pounds, of which 6.02 million pounds was acetylene black. Major suppliers of acetylene black to the U.S. were Canada, 5.72 million pounds, and East Germany, 0.25 million pounds. Brazil exported 66,138 pounds of bone black to the U.S. Other major exporters of carbon black to the U.S. included West Germany, 0.58 million pounds, and Indonesia, 0.52 million pounds.

WORLD REVIEW

Carbon black production continued to increase worldwide. Decreased production was not reported for any country. Total world output was estimated to be 7.07 billion pounds. Insufficient data were available to make reliable estimates of output

for several countries. (See table 11.) Japan, with an increase of 10.6%, had a high rate of growth. However, the United States, with an increase in output of 184 million pounds, had the largest volume increase.

Worldwide, several new operations and expansions were under construction or in the engineering stage to increase output of carbon black. Among the projects were the following: Cancarb Ltd. was in the engineering stage for a 480-ton-per-day thermal carbon black plant at Medicine Hat, Alberta, Canada. Gofi-Nasr Petroleum Co. had a 10,000-ton-per-year plant at Alexandria, Egypt, in the engineering stage. United Carbon India Ltd. expanded capacity of its Bombay, India, plant by 4,900 tons per year. Phillips Carbon Black Italiana S.p.A. increased capacity at its Milan, Italy, plant from 92.6 million to 114.7 million pounds per year. Continental-Columbian Carbon Nederland NV., subsidiary of Continental Carbon and Columbia Carbon Co., was increasing capacity of its Botlek-Rotterdam plant by 15,000 tons per year. Also, Phillips Carbon Black Co. Pty. Ltd. was expanding its Port Elizabeth, Republic of South Africa, plant from 56.7 million to

83.8 million pounds per year. Ashland Oil Canada Ltd. was constructing in Levis County, Quebec, a 40-million-pound-per-year carbon black plant. The French subsidiary of a U.S. joint venture of Phillips Petroleum Co. and Continental Carbon Co. was expanding its Bordeaux carbon black plant from 97 to 129 million pounds per year.

In Canada, Cantex Associates started construction of a 40-million-pound-per-year specialty carbon black plant in Medicine Hat, Alberta. The specialty thermal black, currently produced only in the southern United States, is used in rubber products with a growth market in a new generation of products now being manufactured. This new plant is expected to meet total Canadian demand, estimated to be about 20 million pounds in 1974 and serve export markets in the U.S. and Pacific countries. Presently all Canadian needs for specialty black are imported.

TECHNOLOGY

Carbon black, a petrochemical, is an extremely fine soot, primarily carbon (90 to 99%), that contains some oxygen and hydrogen. Oil furnace black may contain also small amounts of sulfur. The properties of carbon black are determined largely by the process by which it is manufactured. Furnace black, which accounts for 99% of all carbon black produced, is made by three different processes—oil furnace, gas furnace, and thermal. Brief descriptions of these processes, of the channel process, and of the manufacture of lamp-black and acetylene black follow.

Oil Furnace.—In the oil furnace process, liquid hydrocarbons are used. Natural gas is generally burned to furnish the heat of combustion, and atomized oil is introduced into the combustion zone to be burned to various grades of carbon black. Yields range from 35 to 65%, depending on the grade of black produced. Oil furnace grades are GPF, FEF, HAF, ISAF, and SAF. (The full name of each grade is given in the footnotes to table 3.)

The most desirable feedstock oil for furnace black plants has zero to 4° API gravity and is low in sulfur and high in aromatics and olefins. It comes from near the "bottom of the refinery barrel" and is similar in many respects to residual fuel oil.

The rising cost of natural gas has been a factor in the shift to greater use of liquid feedstocks and a decline in the use of natural gas as a source of carbon. At the same time, it should be recognized that oil furnace processing has become very flexible. Oil furnace blacks supplement channel blacks in most high-performance applications, notably passenger car tire treads. Over the past 2 decades, carbon black technology has centered on the oil furnace black process.

Gas Furnace.—The gas furnace process is based on partial combustion of natural gas in refractory-lined furnaces. Carbon black is removed by flocculation and high-voltage electric precipitators. Yields of the gas furnace blacks range from 10 to 30% and are lowest for the smaller particle-size grades. Properties of gas furnace blacks can be modified to a degree by changing the ratio of air to gas. The grades SRF and HMF are generally produced from gas. (The full name of each grade is given in the footnotes to table 3.)

Thermal.—Unlike channel and furnace blacks, thermal blacks are produced by cracking a hydrocarbon; that is, by separating the carbon from the hydrogen and not by the combustion of a hydrocarbon. Thermal furnaces are built in a checker-

board brickwork pattern. Two refractory-lined furnaces, or generators, are used. One generator is heating, using hydrogen as a fuel, while the other generator is being charged with natural gas, which decomposes to produce thermal black and hydrogen. The hydrogen is collected and used as fuel for the generator being heated. Yields of carbon black are primarily in the large particle sizes and range from 40 to 50%.

Channel Black.—Made by the oldest process, channel black is a product of incomplete combustion of natural gas. Small flames are impinged on cool surfaces, or channels, where carbon black is deposited and then scraped off as the channel moves back and forth over a scraper. The properties of channel black are varied by changes in burner tip design, distances from tip to channel, and the amount of air made available for combustion. The process is extraordinarily inefficient chemically. For rubber-reinforcing grades, the yield is only 5%; for high-color blacks of finer particle sizes, the yield shrinks to 1%. Low yields and rising gas prices have spurred the industry to develop other methods to make blacks.

Lampblacks.—Lampblacks are manufactured by slowly burning selected oils and tars in a restricted supply of air. These

blacks are of large particle size, possess little reinforcing ability in rubber, and are lower in jetness and coloring power. They are of value as tinting pigments in certain paints and lacquers. In most applications they have been replaced by carbon blacks.

Acetylene Black.—Acetylene blacks, produced by the thermal decomposition of acetylene, possess a high degree of structural, or chaining, tendency. Their particle size is about 40 micrometers. They provide high elastic modulus and high conductivity in rubber stocks.

A process for the manufacture of carbon black using highly volatile, vitrain-rich, low-ash coals of Assam has been developed at the Regional Research Laboratory, Jorhot, Assam, for the National Research Development Corp. of New Delhi, India. In the process, handpicked coal is crushed, finely ground, and flash decomposed. The product is subsequently treated in a fluidized-bed refractory reactor at a fixed temperature, with air as the fluidizing medium. After initial separation of the char in a cyclone separator, the carbon black can be recovered from the flue gases by water scrubbing and electrostatic precipitation. The carbon black is then pelletized and dried at a temperature of 300°–400° C. The yield is approximately 20%.

Table 1.—Salient statistics of carbon black produced from natural gas and liquid hydrocarbons in the United States

	(Thousand pounds)				
	1968	1969	1970	1971	1972
Production:					
Channel process.....	142,948	132,471	113,548	46,354	22,378
Furnace process.....	2,668,858	2,830,790	2,817,605	2,970,781	3,178,731
Total	2,811,806	2,963,261	2,931,153	3,017,135	3,201,109
Shipments (including losses):					
Domestic.....	2,588,761	2,783,208	2,650,450	2,853,948	3,148,114
Exports.....	263,122	196,203	192,636	163,246	111,328
Total	2,851,883	2,979,411	2,843,086	3,017,194	3,259,442
Producer stocks Dec. 31.....	224,170	208,020	296,087	296,028	237,695
Value:					
Production..... thousand dollars..	205,849	215,120	222,271	232,049	248,361
Average per pound..... cents..	7.32	7.26	7.53	7.69	7.76

Table 2.—Carbon black produced from natural gas and liquid hydrocarbons in the United States, by State

	(Thousand pounds)					Change from 1971 (%)
	1968	1969	1970	1971	1972	
Louisiana.....	1,031,349	1,045,902	982,416	1,078,732	1,077,977	-0.1
Texas.....	1,426,307	1,442,033	1,395,851	1,326,153	1,425,874	+7.5
Other States.....	354,150	475,326	552,886	612,250	697,258	+13.9
Total	2,811,806	2,963,261	2,931,153	3,017,135	3,201,109	+6.1

Table 3.—Production and shipments of carbon black in the United States in 1972, by month and grade

(Thousand pounds)

	SRF ¹	GPF ²	FEF ³	HAF ⁴	SAF ⁵	ISAF ⁶	Thermal	Total (furnace)	Channel	Total
PRODUCTION ⁷										
January.....	20,993	47,319	28,980	72,116	3,788	49,047	21,321	243,564	2,603	246,167
February.....	21,834	43,165	27,849	78,345	2,740	46,179	20,303	240,415	2,394	242,809
March.....	22,261	57,418	34,109	95,627	3,205	41,854	23,287	277,761	2,527	280,288
April.....	22,135	51,908	31,749	91,593	3,085	44,550	20,975	265,990	2,158	268,148
May.....	23,478	55,777	33,651	100,116	2,927	41,597	21,214	276,760	2,298	279,058
June.....	22,649	50,332	33,163	87,270	4,299	36,946	18,341	253,000	1,663	254,663
July.....	23,022	56,625	28,322	92,341	2,643	29,455	19,279	251,687	1,370	253,057
August.....	22,699	51,821	29,382	100,659	3,855	29,554	20,867	258,837	1,644	260,481
September.....	21,748	51,146	31,727	102,126	2,986	31,930	20,164	261,827	1,743	263,570
October.....	25,534	57,221	35,211	108,329	4,921	32,446	21,260	284,922	1,629	286,551
November.....	26,846	59,758	33,010	106,459	6,522	30,163	19,560	282,318	1,134	283,452
December.....	22,413	55,973	35,586	109,977	2,763	32,641	22,297	281,650	1,215	282,865
Total.....	275,612	638,458	382,739	1,144,958	41,734	446,362	248,863	3,178,731	22,378	3,201,109
SHIPMENTS (including exports) ⁸										
January.....	22,535	52,277	31,804	78,733	3,658	48,551	24,340	261,898	3,939	265,837
February.....	23,116	49,813	30,977	81,638	2,452	48,005	23,168	259,169	2,669	261,838
March.....	26,818	58,594	33,131	91,713	4,452	47,337	23,714	285,759	2,008	287,767
April.....	22,131	48,231	30,297	81,089	2,303	40,956	24,020	249,027	2,030	251,057
May.....	25,719	57,276	32,922	102,467	1,940	42,744	26,605	289,673	2,139	291,812
June.....	23,012	51,182	31,737	89,407	3,444	35,984	22,944	257,710	2,019	259,729
July.....	20,212	48,154	25,727	85,553	2,496	28,058	21,914	232,114	1,193	233,307
August.....	23,335	52,867	31,179	96,703	3,673	30,360	25,791	263,908	1,692	265,600
September.....	22,905	53,466	33,938	102,186	3,333	34,433	26,050	276,361	1,779	278,140
October.....	26,341	59,339	33,719	111,339	4,517	33,199	31,240	299,694	1,520	301,214
November.....	27,211	58,190	37,349	111,993	5,361	31,625	25,606	297,335	1,810	299,145
December.....	21,519	54,761	29,761	97,489	3,035	31,422	24,363	262,350	1,646	263,996
Total.....	284,854	644,150	382,541	1,130,310	40,714	452,674	299,755	3,234,998	24,444	3,259,442

¹ Semireinforcing furnace.
² General purpose furnace (includes High-modulus furnace).
³ Fast-extrusion furnace.
⁴ High-abrasion furnace.
⁵ Superabrasion furnace.
⁶ Intermediate-abrasion furnace.
⁷ Compiled from reports of a survey firm and producing companies. Figures adjusted to agree with annual reports of individual producers.
⁸ Includes losses.

Table 4.—Number and capacity of carbon black plants operated in the United States

State	County or Parish	Number of plants				Total daily capacity (pounds)	
		1971		1972		1971	1972
		Channel	Furnace	Channel	Furnace		
Texas.....	Aransas.....	--	1	--	1	4,697,737	5,075,602
	Carson.....	1	--	1	--		
	Ector.....	1	--	--	--		
	Gaines.....	1	--	1	--		
	Gray.....	--	1	--	1		
	Harris.....	--	1	--	1		
	Howard.....	--	2	--	2		
	Hutchinson.....	--	2	--	2		
	Montgomery.....	--	1	--	1		
	Moore.....	--	1	--	1		
Orange.....	--	1	--	1			
Terry.....	--	1	--	1			
Wheeler.....	--	1	--	1			
Total Texas.....		3	12	2	12		
Louisiana.....	Avoyelles.....	--	1	--	1	3,575,374	3,870,108
	Calcasieu.....	--	1	--	1		
	Evangeline.....	--	1	--	1		
	Ouachita.....	--	2	--	2		
	St. Mary.....	--	3	--	3		
West Baton Rouge.....	--	1	--	1			
Total Louisiana.....		--	9	--	9		

See footnote at end of table.

Table 4.—Number and capacity of carbon black plants operated in the United States—Continued

State	County or Parish	Number of plants		Total daily capacity (pounds)	
		1971	1972	1971	1972
		Channel Furnace	Channel Furnace		
Alabama	Russell	--	1	--	1
Arkansas	Union	--	1	--	1
	(Contra Costa	--	1	--	--
California	Kern	--	2	--	3
	Mojave (District)	--	1	--	--
Kansas	Grant	--	1	--	1
New Mexico	Lea	--	1	--	--
Ohio	Lucas	--	1	--	1
	Washington	--	1	--	1
Oklahoma	Kay	--	1	--	1
West Virginia	Pleasants	--	1	--	1
	Marshall	--	1	--	1
Total other States		--	13	--	11
Total United States		3	34	2	32
				2,374,219	2,465,849
				10,647,330	11,411,559

^r Revised.

Table 5.—Carbon black and the feedstocks used in its production, by State

	Louisiana	Texas	Other States ¹	Total
1971				
Carbon black production:				
Total.....thousand pounds	1,078,732	1,326,153	612,250	3,017,135
Value.....thousand dollars	78,169	108,679	45,201	232,049
Average value.....cents per pound	7.25	8.19	7.38	7.69
Natural gas used: ²				
Total.....million cubic feet	25,984	31,987	5,728	63,699
Value.....thousand dollars	4,552	5,551	1,051	11,154
Average value.....cents per thousand cubic feet	17.52	17.35	18.35	17.51
Carbon black produced ³thousand pounds	257,759	42,855	21,817	322,431
Liquid hydrocarbons used:				
Total.....thousand gallons	170,864	263,976	112,864	547,704
Value.....thousand dollars	12,989	21,139	9,469	43,597
Average value.....cents per gallon	7.60	8.01	8.39	7.96
Carbon black produced.....thousand pounds	820,973	1,283,298	590,433	2,694,704
1972				
Carbon black production:				
Total.....thousand pounds	1,077,977	1,425,874	697,258	3,201,109
Value.....thousand dollars	78,843	117,963	51,555	248,361
Average value.....cents per pound	7.31	8.27	7.39	7.76
Natural gas used: ²				
Total.....million cubic feet	23,563	24,720	5,656	53,939
Value.....thousand dollars	4,721	4,356	1,460	10,537
Average value.....cents per thousand cubic feet	20.04	17.62	25.81	19.54
Carbon black produced ³thousand pounds	207,575	43,219	20,182	270,976
Liquid hydrocarbons used:				
Total.....thousand gallons	177,633	277,642	135,478	590,753
Value.....thousand dollars	14,051	22,572	11,405	48,028
Average value.....cents per gallon	7.91	8.13	8.41	8.13
Carbon black produced.....thousand pounds	870,402	1,382,655	677,076	2,930,133

¹ Arkansas, California, Kansas, Ohio, Oklahoma, and West Virginia.

² Includes natural gas used to enrich liquid hydrocarbons.

³ Produced from natural gas used as feedstock.

Table 6.—Natural gas and liquid hydrocarbons used in manufacturing carbon black in the United States and average yield

	1968	1969	1970	1971	1972
Natural gas used ¹million cubic feet	104,973	98,251	85,884	63,699	53,939
Average yield of carbon black per thousand cubic feet.....pounds	4.34	4.64	4.44	5.06	5.02
Average value of natural gas used per thousand cubic feet.....cents	13.71	14.88	16.45	17.51	19.54
Liquid hydrocarbons used.....thousand gallons	484,404	524,370	523,914	547,704	590,753
Average yield of carbon black per gallon.....pounds	4.86	4.78	4.87	4.92	4.96
Average value of liquid hydrocarbons used per gallon.....cents	7.11	7.23	7.35	7.96	8.13
Number of producers reporting.....	8	9	9	9	8
Number of plants.....	35	38	37	37	34

¹ Includes natural gas used to enrich liquid hydrocarbons.

Table 7.—Sales of carbon black for domestic consumption in the United States, by use
(Thousand pounds)

Use	1968	1969	1970	1971	1972	Change from 1971 (%)
Ink.....	67,721	73,077	72,824	75,201	82,532	+9.74
Paint.....	13,435	17,711	14,570	18,693	21,408	+14.52
Paper.....	4,710	5,668	4,527	3,767	4,225	+12.15
Plastics.....	26,863	(1)	(1)	(1)	(1)	--
Rubber.....	2,445,550	2,616,166	2,486,146	2,678,151	2,953,779	+10.29
Miscellaneous ²	30,123	65,327	71,454	77,715	84,764	+9.07
Total.....	2,588,402	2,777,949	2,649,521	2,853,527	3,146,708	+10.27

¹ Included in "Miscellaneous."

² Chemical, food, and plastics (1969-1972) combined with "Miscellaneous" to avoid disclosing individual company confidential data.

Table 8.—Producers' stocks of channel-and furnace-type blacks in the United States, December 31
(Thousand pounds)

Year	Furnace									Channel	Total
	SRF ¹	HMF ¹	GPF ¹	FEF ¹	HAF ¹	SAF ¹	ISAF ¹	Thermal	Total		
1968...	29,695	2,900	14,756	20,047	55,590	3,592	41,621	23,074	191,275	32,895	224,170
1969...	24,478	2,518	20,082	22,254	48,725	4,734	38,712	28,044	189,547	18,473	208,020
1970...	37,875	2,048	46,930	24,771	64,106	5,666	50,513	42,119	274,028	22,059	296,087
1971...	33,551	3,158	35,885	27,619	68,798	6,417	42,870	67,987	286,235	9,743	296,028
1972...	24,309	(2)	33,351	27,817	83,446	7,437	36,558	17,100	230,018	7,677	237,695

¹ For explanation, see footnotes to table 3.

² Included with GPF.

Table 9.—U.S. exports of carbon black, by country
(Thousand pounds and thousand dollars)

Country	1970		1971		1972	
	Quantity	Value	Quantity	Value	Quantity	Value
North America:						
Canada.....	21,917	2,195	26,736	2,472	19,735	2,057
Guatemala.....	1,186	113	396	42	148	17
Mexico.....	2,742	302	2,080	247	1,662	273
Other.....	1,766	178	1,295	121	538	52
Total.....	27,611	2,788	30,507	2,882	22,083	2,399
South America:						
Argentina.....	1,793	304	3,412	433	1,425	248
Brazil.....	5,343	565	6,423	689	3,553	335
Chile.....	357	58	433	69	318	54
Colombia.....	515	104	529	97	471	77
Peru.....	231	25	192	27	250	29
Venezuela.....	695	88	941	100	809	97
Other.....	202	24	183	24	55	9
Total.....	9,136	1,168	12,113	1,439	6,881	899
Europe:						
Austria.....	159	31	81	21	140	43
Belgium-Luxembourg.....	4,559	409	2,143	233	2,931	278
Denmark.....	1,355	273	823	130	954	180
Finland.....	412	69	163	27	302	33
France.....	35,603	3,751	16,514	1,900	13,815	1,558
Germany, West.....	15,338	1,766	6,997	878	7,252	792
Italy.....	12,055	1,657	5,894	830	4,212	552
Netherlands.....	13,484	2,047	43,622	5,550	15,998	2,503
Norway.....	1,052	84	874	82	433	43
Portugal.....	509	66	253	39	278	42
Spain.....	4,457	587	2,295	274	1,961	261
Sweden.....	3,392	338	1,006	89	192	24
Switzerland.....	1,271	145	986	93	955	103
United Kingdom.....	16,638	3,032	6,416	989	5,525	903
Yugoslavia.....	147	38	99	26	148	42
Other.....	172	45	168	25	71	14
Total.....	110,603	14,338	88,334	11,186	55,167	7,371

Table 9.—U.S. exports of carbon black, by country—Continued
(Thousand pounds and thousand dollars)

Country	1970		1971		1972	
	Quantity	Value	Quantity	Value	Quantity	Value
Africa:						
Ghana	1,122	100	1,089	100	940	115
Kenya	--	--	681	56	748	67
South Africa, Republic of	6,696	646	5,989	600	4,431	424
Tanzania	--	--	168	16	51	6
Other	427	94	125	15	56	8
Total	8,245	840	7,952	787	6,226	620
Asia:						
India	1,468	207	912	146	1,988	233
Indonesia	432	38	185	15	195	16
Iran	1,457	132	573	50	91	15
Israel	383	42	324	38	468	51
Japan	9,905	2,596	8,828	2,335	7,996	2,117
Korea, Republic of	3,481	354	480	95	582	120
Pakistan	3,159	292	209	18	226	18
Philippines	689	69	637	72	625	59
South Vietnam	1,368	144	725	88	1,071	98
Taiwan	583	109	796	196	748	159
Thailand	1,406	124	1,050	92	684	58
Turkey	1,798	160	687	66	100	14
Other	1,256	131	760	98	994	109
Total	27,385	4,398	16,166	3,309	15,668	3,062
Oceania:						
Australia	6,951	728	6,074	635	3,523	407
New Zealand	2,705	245	2,100	187	1,780	166
Total	9,656	973	8,174	822	5,303	573
Grand total	192,636	24,505	163,246	20,425	111,328	14,924

Table 10.—U.S. exports of carbon black in 1972, by month
(Thousand pounds and thousand dollars)

Month	Channel		Furnace		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
January	1,561	515	8,914	869	10,475	1,384
February	1,489	598	9,262	880	10,751	1,478
March	541	306	6,109	639	6,650	945
April	944	393	5,827	550	6,771	943
May	1,309	532	9,889	905	11,198	1,437
June	853	302	7,997	789	8,850	1,091
July	857	407	8,414	775	9,271	1,182
August	504	328	6,434	594	6,938	922
September	1,055	449	11,429	1,041	12,484	1,490
October	993	649	9,912	882	10,905	1,531
November	675	255	7,802	635	8,477	890
December	1,253	835	7,305	796	8,558	1,631
Total	12,034	5,569	99,294	9,355	111,328	14,924

Table 11.—Carbon black: World production by country
(Million pounds)

Country ¹	1970	1971	1972 ²
Argentina ^e	66	66	66
Australia ^e	100	116	128
Belgium	4	^e 4	^e 4
Brazil	^r 108	126	^e 132
Canada ^e	170	186	196
Colombia ^e	35	40	45
Czechoslovakia ^e	4	22	33
France	328	345	350
Germany, West	523	578	582
Hungary	9	^e 9	^e 9
India	^e 66	84	^e 88
Indonesia	--	1	^e 3
Italy	272	276	^e 278
Japan	650	679	751
Korea, Republic of	7	16	19
Mexico ^e	60	70	74
Netherlands	190	204	206
Romania	160	164	^e 165
South Africa, Republic of ^e	58	62	66
Spain	^r 89	^e 90	^e 90
Sweden ^e	40	45	50
Taiwan	(²)	(²)	(²)
United Kingdom	464	480	^e 485
United States	2,931	3,017	3,201
Venezuela	16	^e 16	^e 16
Yugoslavia	30	35	^e 35
Total	^r 6,380	6,731	7,072

^e Estimate. ² Preliminary. ^r Revised.

¹ In addition to the countries listed, the People's Republic of China, Norway, Poland, and the U.S.S.R. produce carbon black, but available information is inadequate to make reliable estimates of output levels.

² Less than 1 million pounds.

