

# Mineral Industry Surveys

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## CHROMIUM IN JUNE 2008

On the basis of gross weight, consumption of chromium ferroalloys and metal in June 2008 decreased 3% compared with consumption in May 2008; consumption in the second quarter 2008 increased 4% compared with consumption in the first quarter 2008 and decreased 7% compared with revised consumption in the second quarter 2007, according to the U.S. Geological Survey.

Included in this Mineral Industry Surveys are U.S. salient chromium statistics, U.S. Government stockpile inventory of chromium materials in June 2008, consumption by end use and consumer stocks of chromium ferroalloys and metal at the end of June 2008, U.S. foreign trade data for selected chromium-containing materials in May 2008, and chromium ferroalloys and metal prices.

TABLE 1  
U.S. SALIENT CHROMIUM STATISTICS<sup>1</sup>

(Metric tons, gross weight)

	2007	2008			
	January-December <sup>2</sup>	April	May	June	January-June <sup>2</sup>
<b>Production:</b>					
Stainless steel production <sup>3</sup>	2,170,000	211,000	203,000 <sup>r</sup>	164,000	1,180,000
<b>Components of U.S. supply:</b>					
Stainless steel scrap receipts	953,000	74,000	75,700	71,600	466,000
Stainless steel scrap consumption	1,430,000	117,000	115,000	111,000	705,000
<b>Imports for consumption:</b>					
Chromite ore	145,000	7,910	5,050	(4)	73,800 <sup>5</sup>
<b>Ferrochromium:</b>					
More than 4% carbon	384,000	31,800	43,900	(4)	213,000 <sup>5</sup>
More than 3% carbon but not more than 4% carbon	267	--	--	(4)	160 <sup>5</sup>
More than 0.5%, but not more than 3% carbon	7,110	--	34	(4)	1,820 <sup>5</sup>
Not more than 0.5% carbon	31,700	1,830	4,260	(4)	16,000 <sup>5</sup>
Ferrochromium silicon	37,300	2,600	4,280	(4)	11,900 <sup>5</sup>
Total ferroalloy imports	460,000	36,300	52,500	(4)	243,000 <sup>5</sup>
Chromium metal <sup>6</sup>	11,700	1,210	1,210	(4)	5,750 <sup>5</sup>
Stainless steel	809,000	76,700	71,100	(4)	361,000 <sup>5</sup>
Stainless steel scrap	118,000	13,900	19,700	(4)	71,200 <sup>5</sup>
<b>Distribution of U.S. supply:</b>					
Consumption, industry, chromium ferroalloys and metal	447,000	36,200	37,600	36,500	216,000
<b>Exports:</b>					
Chromite ore	37,600	778	369	(4)	2,870 <sup>5</sup>
<b>Chromium ferroalloys:</b>					
High-carbon ferrochromium	24,700	2,280	1,770	(4)	6,990 <sup>5</sup>
Low-carbon ferrochromium	16,200	2,410	2,600	(4)	8,470 <sup>5</sup>
Ferrochromium silicon	328	--	12	(4)	104 <sup>5</sup>
Total ferroalloy exports	41,100	4,680	4,370	(4)	15,600 <sup>5</sup>
Chromium metal	1,210	80	129	(4)	467 <sup>5</sup>
Stainless steel	476,000	39,200	42,800	(4)	195,000 <sup>5</sup>
Stainless steel scrap	882,000	72,200	75,200	(4)	407,000 <sup>5</sup>
<b>Stocks at end of period:</b>					
Consumer, industry, chromium ferroalloys and metal	XX	11,400	11,800	11,800	XX
<b>Government stockpile:</b>					
Chromium ferroalloys	XX	140,000	139,000	139,000	XX
Chromium metal	XX	4,940	4,930	4,930	XX

<sup>r</sup>Revised. XX Not applicable. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include revised data that are not broken out by specific month.

<sup>3</sup>Data on stainless steel production reported by American Iron and Steel Institute; monthly, quarterly, and year-to-date production of stainless and heat-resisting raw steel.

<sup>4</sup>Data to be published in a subsequent issue.

<sup>5</sup>January through May data only.

<sup>6</sup>Includes waste and scrap and other.

TABLE 2  
U.S. REPORTED CONSUMPTION AND STOCKS OF CHROMIUM PRODUCTS IN  
2008<sup>1,2</sup>

(Metric tons, gross weight unless otherwise noted)

	May	June	January- June <sup>3</sup>
<b>Consumption by end use:</b>			
<b>Alloy uses:</b>			
<b>Steel:</b>			
Carbon steel	306	326	1,840
High-strength low-alloy steel	311	305	1,670
Stainless and heat-resisting steel	31,500	30,300	180,000
Full alloy steel	1,770	1,850	9,990
Tool steel	416	416	2,500
Steel end use, not reported by grade	2,190	2,140	12,900
Superalloys	463	494	2,840
Other alloys and uses <sup>4</sup>	709	699	4,220
<b>Total</b>	<b>37,600</b>	<b>36,500</b>	<b>216,000</b>
<b>Total, chromium content</b>	<b>22,100</b>	<b>21,600</b>	<b>126,000</b>
<b>Consumption by material:</b>			
Low-carbon ferrochromium	2,610	2,620	15,100
High-carbon ferrochromium	31,700	30,600	181,000
Ferrochromium silicon	W	W	W
Chromium metal <sup>5</sup>	251	284	1,540
Chromite ore	W	W	W
Chromium-aluminum alloy	W	W	W
Other chromium materials	W	W	W
<b>Total</b>	<b>37,600</b>	<b>36,500</b>	<b>216,000</b>
<b>Total, chromium content</b>	<b>22,100</b>	<b>21,600</b>	<b>126,000</b>
<b>Consumer stocks:</b>			
Low-carbon ferrochromium	1,860	1,840	XX
High-carbon ferrochromium	8,620	8,650	XX
Ferrochromium silicon	1,050	1,140	XX
Chromium metal	175	124	XX
Chromium-aluminum alloy	W	W	XX
Other chromium materials	W	W	XX
<b>Total</b>	<b>11,800</b>	<b>11,800</b>	<b>XX</b>
<b>Total, chromium content</b>	<b>6,900</b>	<b>6,990</b>	<b>XX</b>

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes estimates.

<sup>3</sup>May include revised data that are not broken out by specific month.

<sup>4</sup>Includes cast irons, welding and alloy hard-facing rods and materials, wear- and corrosion-resistant alloys, and aluminum, copper, magnetic, nickel, and other alloys.

<sup>5</sup>Includes waste and scrap and other.

TABLE 3  
U.S. GOVERNMENT STOCKPILE INVENTORY OF  
CHROMIUM MATERIALS<sup>1,2</sup>

(Metric tons)

Period	Chromium ferroalloys		Chromium metal
	High-carbon ferro-chromium	Low-carbon ferro-chromium	
2007:			
June	177,000	86,700	5,280
July	177,000	86,700	5,150
August	170,000	92,200	5,150
September	113,000	61,000	5,150
October	108,000	60,500	5,090
November	104,000	57,800	5,030
December	99,400	55,400	4,970
2008:			
January	98,200	54,700	4,970
February	95,000	50,800	4,940
March	93,600	48,100	4,940
April	93,600	46,900	4,940
May	93,500	45,800	4,930
June	93,600	45,100	4,930

<sup>1</sup>Data are rounded to no more than three significant digits.

<sup>2</sup>These Government stocks are reported by the Defense National Stockpile Center in Inventory of Stockpile Materials D-1, which reports uncommitted inventory. Uncommitted inventory is that inventory for which there is no sales contract. Committed inventory is that inventory for which there is a sales contract, however, the material has not yet been shipped. For chromium materials, the D-1 report includes chromium materials that (1) meet specifications and are held in excess of goal and (2) do not meet specifications and are held in excess of goal. The D-1 report excludes chromium materials that are committed and awaiting shipment.

Source: Defense National Stockpile Center.

TABLE 4  
U.S. EXPORTS OF CHROMITE ORE, CHROMIUM FERROALLOYS, AND METAL<sup>1,2</sup>

Period	Chromite ore		Chromium ferroalloys <sup>3</sup>			Chromium metal <sup>4</sup>	
	Gross weight (metric tons)	Value (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value (thousands)	Gross weight (metric tons)	Value (thousands)
<b>2007:</b>							
May	13,100	\$1,150	4,060	2,540	\$5,740	105	\$1,440
June	790	308	1,830	1,040	2,680	75	1,520
July	844	350	1,130	657	1,760	102	1,760
August	874	364	1,270	747	1,960	123	2,690
September	406	231	4,030	2,470	6,760	95	1,670
October	6,340	812	933	568	1,620	74	1,390
November	525	400	1,580	831	2,600	125	3,850
December	534	284	1,440	737	2,680	67	1,170
January-December	37,600	5,560	41,100	25,800	51,200	1,210	23,200
<b>2008:</b>							
January	482	255	2,040	957	4,470	96	1,600
February	657	424	2,210	905	3,650	30	845
March	582	282	2,260	946	3,600	131	1,940
April	778	411	4,680	1,810	6,500	80	1,610
May	369	242	4,370	2,040	10,800	129	2,040
January-May	2,870	1,610	15,600	6,660	29,100	467	8,030

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include revised data that are not broken out by specific month.

<sup>3</sup>Includes low- and high-carbon ferrochromium and ferrochromium silicon.

<sup>4</sup>Includes chromium metal, waste and scrap, and unwrought powders.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF CHROMITE ORE, FERROCHROMIUM, AND CHROMIUM METAL<sup>1</sup>

(Metric tons)

	2007		2008	
	January-December <sup>2</sup>	April	May	January-May <sup>2</sup>
<b>Chromite ore:</b>				
Not more than 40%:				
Gross weight	52	--	--	--
Chromic oxide content	19	--	--	--
More than 40% but less than 46% chromic oxide:				
Gross weight	26,400	175	460	3,070
Chromic oxide content	12,100	80	370	1,570
46% or more chromic oxide:				
Gross weight	119,000	7,730	4,590	70,700
Chromic oxide content	55,600	3,720	2,120	34,400
<b>Total, all grades:</b>				
Gross weight	145,000	7,910	5,050	73,800
Chromic oxide content	67,800	3,800	2,490	36,000
<b>Ferrochromium:</b>				
Low-carbon: <sup>3</sup>				
Not more than 0.5%:				
Gross weight	31,700	1,830	4,260	16,000
Chromium content	21,000	1,260	2,870	10,900
More than 0.5% but not more than 3%:				
Gross weight	7,110	--	34	1,820
Chromium content	4,020	--	23	1,150
<b>Total, low-carbon:</b>				
Gross weight	38,800	1,830	4,300	17,800
Chromium content	25,100	1,260	2,890	12,000
Medium-carbon: <sup>4</sup>				
Gross weight	267	--	--	160
Chromium content	144	--	--	90
High-carbon: <sup>5</sup>				
Gross weight	384,000	31,800	43,900	213,000
Chromium content	217,000	17,900	26,900	122,000
<b>Total, all grades:</b>				
Gross weight	423,000	33,700	48,200	231,000
Chromium content	242,000	19,200	29,800	134,000
<b>Chromium metal:</b>				
Unwrought powders	822	40	50	327
Waste and scrap	357	41	49	316
Other than waste and scrap and unwrought powders	10,500	1,130	1,110	5,100
<b>Total, all grades:</b>	<b>11,700</b>	<b>1,210</b>	<b>1,210</b>	<b>5,750</b>

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include revised data that are not broken out by specific month.

<sup>3</sup>Ferrochromium containing not more than 3% carbon.

<sup>4</sup>Ferrochromium containing more than 3% carbon but not more than 4% carbon.

<sup>5</sup>Ferrochromium containing more than 4% carbon.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF FERROCHROMIUM IN 2008,  
BY GRADE AND BY COUNTRY<sup>1</sup>

Grade and country	May			January-May <sup>2</sup>		
	Gross weight (metric tons)	Chromium content (metric tons)	Value <sup>3</sup> (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value <sup>3</sup> (thousands)
<b>High-carbon ferrochromium:<sup>4</sup></b>						
Brazil	2,000	1,040	\$3,820	2,000	1,040	\$3,820
China	427	264	1,110	447	276	1,180
India	4,210	2,560	8,780	40,400	24,900	65,700
Italy	--	--	--	159	100	260
Kazakhstan	19,100	13,200	59,500	35,200	24,300	99,800
Mexico	--	--	--	19	14	60
Russia	2,760	1,740	8,570	17,100	11,000	41,500
South Africa	10,400	5,160	17,300	95,600	46,700	109,000
Sweden	172	109	278	392	240	627
Zimbabwe	4,850	2,850	15,000	21,900	12,800	55,100
Total	43,900	26,900	114,000	213,000	122,000	377,000
<b>Medium-carbon ferrochromium,<sup>5</sup> Russia</b>						
	--	--	--	160	90	152
<b>Low-carbon ferrochromium:<sup>6</sup></b>						
More than 0.5% but not more than 3%:						
China	--	--	--	340	212	1,200
Russia	34	23	198	1,080	726	3,690
South Africa	--	--	--	400	216	619
Total	34	23	198	1,820	1,150	5,510
Not more than 0.5% carbon:						
Brazil	--	--	--	37	25	116
China	840	546	3,690	1,200	774	4,980
Germany	1,210	814	5,490	2,330	1,600	8,880
Japan	344	222	1,430	1,780	1,180	4,080
Kazakhstan	--	--	--	287	190	477
Russia	1,840	1,270	12,100	9,960	6,850	49,500
South Africa	--	--	--	283	174	437
Sweden	34	23	106	110	78	531
Total	4,260	2,870	22,800	16,000	10,900	69,000
<b>All grades:</b>						
Brazil	2,000	1,040	3,820	2,030	1,070	3,940
China	1,270	809	4,800	1,990	1,260	7,360
Germany	1,210	814	5,490	2,330	1,600	8,880
India	4,210	2,560	8,780	40,400	24,900	65,700
Italy	--	--	--	159	100	260
Japan	344	222	1,430	1,780	1,180	4,080
Kazakhstan	19,100	13,200	59,500	35,500	24,500	100,000
Mexico	--	--	--	19	14	60
Russia	4,630	3,030	20,800	28,300	18,700	94,800
South Africa	10,400	5,160	17,300	96,200	47,100	110,000
Sweden	207	132	384	502	317	1,160
Zimbabwe	4,850	2,850	15,000	21,900	12,800	55,100
Total	48,200	29,800	137,000	231,000	134,000	452,000

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include revised data that are not broken out by specific month.

<sup>3</sup>Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

<sup>4</sup>Ferrochromium containing more than 4% carbon.

<sup>5</sup>Ferrochromium containing more than 3% carbon but not more than 4% carbon.

<sup>6</sup>Ferrochromium containing not more than 3% carbon.

Source: U.S. Census Bureau.

TABLE 7  
U.S. IMPORTS FOR CONSUMPTION OF CHROMIUM METAL IN 2008,  
BY GRADE AND BY COUNTRY<sup>1</sup>

Grade and country	May		January-May <sup>2</sup>	
	Gross weight (metric tons)	Value <sup>3</sup> (thousands)	Gross weight (metric tons)	Value <sup>3</sup> (thousands)
<b>Unwrought powders:</b>				
China	41	\$250	81	\$564
France	--	--	27	60
Germany	--	--	1	51
Japan	7	275	13	542
Netherlands	--	--	20	173
Russia	--	--	131	1,030
United Kingdom	2	87	53	845
Total	50	612	327	3,260
<b>Waste and scrap:</b>				
China	20	250	40	314
Germany	--	--	(4)	10
Japan	--	--	2	22
Malaysia	--	--	23	190
Mexico	29	117	241	909
Singapore	--	--	10	100
Total	49	368	316	1,550
<b>Other than waste and scrap and unwrought powders:</b>				
China	120	1,240	746	6,460
France	248	2,800	1,390	15,700
Germany	34	674	55	1,590
India	--	--	126	170
Italy	(4)	13	1	20
Japan	1	33	5	140
Russia	400	3,800	1,560	15,000
United Kingdom	309	3,190	1,230	12,700
Total	1,110	11,800	5,100	51,800
<b>All grades:</b>				
China	181	1,740	867	7,340
France	248	2,800	1,420	15,700
Germany	34	674	57	1,650
India	--	--	126	170
Italy	(4)	13	1	20
Japan	8	308	20	704
Malaysia	--	--	23	190
Mexico	29	117	241	909
Netherlands	--	--	20	173
Russia	400	3,800	1,690	16,000
Singapore	--	--	10	100
United Kingdom	311	3,280	1,280	13,600
Total	1,210	12,700	5,750	56,600

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>May include revised data that are not broken out by specific month.

<sup>3</sup>Customs import value generally represents a value in the

<sup>4</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 8  
U.S. STAINLESS STEEL TRADE, BY PRODUCT, IN 2008<sup>1</sup>

Stainless steel product	May		January-May	
	Gross weight (metric tons)	Value <sup>2</sup> (thousands)	Gross weight (metric tons)	Value <sup>2</sup> (thousands)
<b>Exports:</b>				
Ingot	1,900	\$10,800	7,990	\$55,500
Flat-rolled (width > 600 mm)	23,000	79,200	105,000	376,000
Flat-rolled (width < 600 mm)	9,070	48,300	39,900	254,000
Bars and rods in irregular coils	469	3,360	3,540	19,800
Other bars and rods	3,840	26,500	17,400	121,000
Wire	620	5,040	3,470	27,400
Tubes, pipes, hollow profiles	3,990	32,500	18,500	153,000
Total	42,800	206,000	195,000	1,010,000
Stainless steel scrap	75,200	103,000	407,000	508,000
Grand total	118,000	309,000	602,000	1,510,000
<b>Imports:</b>				
Ingot	9,170	41,800	53,600	238,000
Flat-rolled (width > 600 mm)	33,900	139,000	172,000	666,000
Flat-rolled (width < 600 mm)	4,030	20,300	19,600	101,000
Bars and rods in irregular coils	2,690	13,800	12,000	56,700
Other bars and rods	8,070	50,700	42,400	245,000
Wire	3,970	24,900	17,000	106,000
Tubes, pipes, hollow profiles	9,290	89,600	44,700	394,000
Total	71,100	380,000	361,000	1,810,000
Stainless steel scrap	19,700	34,200	71,200	133,000
Grand total	90,800	414,000	433,000	1,940,000

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Export value is free alongside ship. Import value is Customs import value, which generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

Source: U.S. Census Bureau.

TABLE 9  
CHROMITE ORE PRICES AVERAGE MONTHLY AND ANNUAL PRICES

(Dollars per metric ton, gross weight unless otherwise noted)

Month	Turkey <sup>1</sup>			South Africa <sup>2</sup>							
	1	2	3	1	2	3	4	5	6	7	
2007:											
June	420 - 420	440 - 440	NA - NA	270 - 280	270 - 280	210 - 220	240 - 260	255 - 275	110 - 125	NA - NA	NA - NA
July	405 - 405	425 - 425	NA - NA	245 - 260	245 - 260	240 - 260	280 - 295	255 - 275	220 - 240	NA - NA	NA - NA
August	364 - 364	392 - 392	NA - NA	218 - 232	222 - 238	240 - 260	280 - 295	255 - 275	220 - 240	NA - NA	NA - NA
September	363 - 363	393 - 393	NA - NA	225 - 240	235 - 250	265 - 270	285 - 295	345 - 345	220 - 240	NA - NA	NA - NA
October	390 - 390	420 - 420	NA - NA	258 - 269	258 - 269	300 - 300	320 - 320	410 - 410	220 - 240	NA - NA	NA - NA
November	403 - 403	435 - 435	NA - NA	263 - 275	263 - 275	330 - 340	340 - 340	430 - 430	210 - 230	NA - NA	NA - NA
December	425 - 425	450 - 450	NA - NA	268 - 278	268 - 278	270 - 350	300 - 350	455 - 455	240 - 290	NA - NA	NA - NA
Yearly avg.	360 - 360	382 - 382	NA - NA	238 - 249	238 - 250	224 - 240	248 - 267	292 - 306	163 - 191	NA - NA	NA - NA
2008:											
January	420 - 420	440 - 440	200 - 300	268 - 278	268 - 278	340 - 340	350 - 370	450 - 480	270 - 290	NA - NA	NA - NA
February	450 - 450	470 - 470	200 - 300	298 - 308	298 - 308	360 - 370	380 - 400	460 - 480	270 - 290	NA - NA	NA - NA
March	509 - 509	529 - 529	200 - 300	393 - 403	393 - 403	360 - 370	380 - 400	460 - 480	270 - 290	NA - NA	NA - NA
April	588 - 588	618 - 618	200 - 300	440 - 450	440 - 450	360 - 370	380 - 400	460 - 480	270 - 290	NA - NA	NA - NA
May	600 - 600	635 - 635	200 - 300	450 - 460	450 - 460	390 - 415	420 - 435	550 - 580	300 - 350	NA - NA	NA - NA
June	600 - 600	635 - 635	200 - 300	393 - 413	410 - 430	450 - 480	480 - 510	550 - 580	420 - 420	NA - NA	NA - NA
Month	South Africa		Kazakhstan <sup>3</sup>	Philippines <sup>4</sup>	Sand <sup>5</sup>						
	8	9									
2007:											
June	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
July	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
August	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
September	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
October	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
November	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
December	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
Yearly avg.	NA - NA	NA - NA	NA - NA	125 - 140	170 - 175						
2008:											
January	NA - NA	NA - NA	200 - 300	125 - 140	170 - 175						
February	NA - NA	NA - NA	200 - 300	125 - 140	170 - 175						
March	NA - NA	NA - NA	200 - 300	125 - 140	170 - 175						
April	NA - NA	NA - NA	200 - 300	125 - 140	170 - 175						
May	NA - NA	NA - NA	200 - 300	125 - 140	170 - 175						
June	NA - NA	NA - NA	200 - 300	125 - 140	170 - 175						

NA Not available.

<sup>1</sup>Source for Turkey 1 price is Ryan's Notes. Turkey 1 is called 38-40% Cr<sub>2</sub>O<sub>3</sub> before 07/07/06 and 40-42% cfr China on and after 07/07/06 by Ryan's Notes. Source for Turkey 2 price is Ryan's Notes. Turkey 2 is called 44% Cr<sub>2</sub>O<sub>3</sub> cfr China by Ryan's Notes. Source for Turkey 3 price is Industrial Minerals. Turkey 3 is called 40-42% 2.5:1 (scale pro rata) by Industrial Minerals.

<sup>2</sup>Source for South Africa 1 price is Ryan's Notes. South Africa 1 is called 39% Cr<sub>2</sub>O<sub>3</sub> free on board (f.o.b.) South Africa by Ryan's Notes. Source for South Africa 2 price is Ryan's Notes. South Africa 2 is called 44% chrome concentrate f.o.b. South Africa by Ryan's Notes. Source for South Africa 3 price is Industrial Minerals. South Africa 3 is called chemical grade, 46% Cr<sub>2</sub>O<sub>3</sub>, wet bulk, f.o.b. by Industrial Minerals. Source for South Africa 4 price is Industrial Minerals. South Africa 4 is called foundry grade, 46% Cr<sub>2</sub>O<sub>3</sub>, wet bulk, f.o.b. by Industrial Minerals. Source for South Africa 5 price is Industrial Minerals. South Africa 5 is called refractory grade, 46% Cr<sub>2</sub>O<sub>3</sub>, wet bulk, f.o.b. by Industrial Minerals. Source for South Africa 6 price is Industrial Minerals. South Africa 6 is called Northwest, metallurgical grade, friable lumpy, basis 40% Cr<sub>2</sub>O<sub>3</sub>, f.o.b. by Industrial Minerals. Source for South Africa 7 price is Metal Bulletin. South Africa 7 is called friable lumpy basis 35-40% chrome ore; cost, insurance and freight (c.i.f.) main Chinese ports by Metal Bulletin. Source for South Africa 8 price is Metal Bulletin. South Africa 8 is called LG6 metallurgical grade basis 42% chrome ore; cost, c.i.f. main Chinese ports by Metal Bulletin. Source for South Africa 9 price is Metal Bulletin. South Africa 9 is called UG2 metallurgical grade basis 40% chrome ore; cost, c.i.f. main Chinese ports by Metal Bulletin.

<sup>3</sup>Source for Kazakhstan price is Industrial Minerals. Kazakhstan is called 40-41% min. by Industrial Minerals.

<sup>4</sup>Source for Philippines price is Industrial Minerals. Philippines is called refractory grade, f.o.b., sand, molding grade, 98% < 30 mesh, del UK by Industrial Minerals.

<sup>5</sup>Source for Sand price is Industrial Minerals. Sand is called molding grade, 98% < 30 mesh, del. UK reported in British pounds by Industrial Minerals.

TABLE 10  
HIGH-CARBON FERROCHROMIUM AVERAGE MONTHLY AND ANNUAL PRICES

(Cents per pound, contained chromium)

Month	United States <sup>1</sup>				
	1	2	3	4	5
2007:					
June	114.40 - 123.20	126.00 - 130.00	101.60 - 114.40	124.00 - 129.40	110 - 120
July	124.00 - 130.75	132.75 - 138.00	100.00 - 112.50	127.00 - 133.25	120 - 130
August	107.00 - 115.00	125.00 - 130.70	102.00 - 115.00	120.20 - 125.60	120 - 130
September	101.25 - 107.50	130.25 - 135.25	107.50 - 116.25	126.75 - 131.00	120 - 130
October	116.25 - 125.00	142.25 - 146.25	113.75 - 120.00	137.00 - 142.75	130 - 140
November	137.90 - 142.50	162.00 - 166.10	121.25 - 132.50	155.00 - 163.75	137 - 143
December	143.00 - 148.00	168.25 - 174.13	140.00 - 155.00	162.75 - 170.50	150 - 165
Yearly avg.	101.99 - 107.70	117.56 - 121.62	97.14 - 105.55	113.31 - 118.57	104 - 112
2008:					
January	147.18 - 149.19	172.50 - 175.75	145.00 - 157.50	165.00 - 170.50	150 - 165
February	161.60 - 166.56	192.40 - 196.80	173.00 - 184.00	188.80 - 195.60	174 - 183
March	192.50 - 198.75	223.75 - 232.50	201.25 - 207.50	207.50 - 215.00	215 - 221
April	204.00 - 208.25	240.00 - 245.00	205.00 - 215.00	225.00 - 236.25	241 - 246
May	204.80 - 209.95	241.00 - 247.00	205.00 - 215.00	224.60 - 240.00	246 - 251
June	205.00 - 211.44	240.75 - 248.25	205.00 - 215.00	211.25 - 225.00	245 - 250

See footnotes at end of table.

TABLE 10--Continued  
HIGH-CARBON FERROCHROMIUM AVERAGE MONTHLY AND ANNUAL PRICES

(Cents per pound, contained chromium)

Month	Europe <sup>2</sup>				Japan <sup>3</sup>		Hong Kong <sup>4</sup>	China <sup>5</sup>
	1	2	3	4	1	2		
2007:								
June	84 - 86	132 - 137	85 - 87	120 - 130	105.00 - 112.00	90	94 - 130	8,640 - 9,020
July	102 - 104	140 - 145	99 - 101	128 - 138	120.00 - 125.00	90	100 - 138	8,440 - 8,600
August	102 - 104	136 - 141	99 - 101	130 - 145	101.00 - 107.00	108	100 - 145	8,300 - 8,580
September	102 - 104	135 - 140	99 - 101	131 - 146	93.75 - 98.75	108	100 - 146	8,500 - 8,800
October	102 - 104	135 - 140	99 - 101	140 - 150	95.00 - 100.00	108	100 - 150	8,830 - 9,200
November	102 - 104	135 - 140	100 - 106	156 - 165	112.00 - 118.00	108	100 - 165	9,120 - 9,420
December	102 - 104	150 - 160	107 - 114	170 - 191	120.00 - 130.00	108	100 - 191	9,250 - 9,740
Yearly avg.	90 - 92	114 - 119	92 - 92	116 - 126	94.77 - 99.48	96	87 - 94	8,300 - 8,580
2008:								
January	102 - 104	150 - 160	192 - 210	245 - 325	230.00 - 240.00	200	100 - 110	58 - 62
February	137 - 145	196 - 214	192 - 210	243 - 310	230.00 - 240.00	200	100 - 110	60 - 63
March	178 - 188	233 - 258	205 - 220	230 - 275	190.00 - 210.00	210	100 - 110	71 - 75
April	190 - 200	250 - 280	205 - 220	220 - 260	184.00 - 204.00	213	100 - 110	94 - 102
May	190 - 200	250 - 280	205 - 220	220 - 254	172.50 - 185.00	213	100 - 110	103 - 107
June	190 - 200	250 - 280	189 - 206	199 - 230	145.00 - 150.00	197	100 - 110	94 - 101

<sup>1</sup>Source for United States 1 price is Platts Metals Week; United States 1 is called United States charge 50%-55% chromium, imported, by Platts Metals Week. Source for United States 2 price is Platts Metals Week; United States 2 is called United States 60%-65% chromium, imported, by Platts Metals Week. Source for United States 3 price is Ryan's Notes; United States 3 is called 50%-52% chromium, imported, North American transaction by Ryan's Notes. Source for United States 4 price is Ryan's Notes; United States 4 is called 60%-65% chromium, imported, North American transaction by Ryan's Notes. Source for United States 5 price is Metal Bulletin; United States 5 is called 6%-8% carbon, basis 60%-65% chromium, max. 2% silicon, by Metal Bulletin.

<sup>2</sup>Source for Europe 1 price is Platts Metals Week; Europe 1 is called high-carbon 52% chromium, by Platts Metals Week. Source for Europe 2 price is Platts Metals Week; Europe 2 is called high-carbon 62% chromium, by Platts Metals Week. Source for Europe 3 price is Metal Bulletin; Europe 3 is called lumpy chromium charge, basis 52% chromium, quarterly by Metal Bulletin. Source for Europe 4 price is Metal Bulletin; Europe 4 is called 6%-8% carbon, basis 60% chromium, max. 1.5% silicon, by Metal Bulletin.

<sup>3</sup>Source for Japan 1 price is Platts Metals Week; Japan 1 is called 50%-55% chromium, spot, cost insurance freight (c.i.f.), by Platts Metals Week. Source for Japan 2 price is Platts Metals Week; Japan 2 is called 50%-55% chromium, regular, c.i.f., by Platts Metals Week.

<sup>4</sup>Source for Hong Kong price is Platts Metals Week; Hong Kong is called high-carbon 60% chromium, by Platts Metals Week.

<sup>5</sup>Source for China price is Metal Bulletin; China is called 6%-8% carbon, basis 60% chromium, delivered duty paid China RMB/tonne (metric ton), by Metal Bulletin. As a result of conversion of price reported in Yuan to U.S. dollars, variations result from changes in price and exchange rate. The University of British Columbia, Sauter School of Business, Pacific Exchange Rate Service at URL <http://fx.sauder.ubc.ca/data.html> is the source of Yuan/U.S. dollar exchange rates.

TABLE 11  
LOW-CARBON FERROCHROMIUM AVERAGE MONTHLY AND ANNUAL PRICES

(Dollars per pound, contained chromium, unless otherwise noted)

Month	United States <sup>1</sup>				
	1	2	3	4	5
2007:					
June	1.68 - 1.74	1.47 - 1.52	1.46 - 1.51	1.65 - 1.72	1.50 - 1.55
July	1.70 - 1.81	1.55 - 1.60	1.54 - 1.59	1.69 - 1.80	1.53 - 1.57
August	1.70 - 1.78	1.52 - 1.58	1.51 - 1.57	1.69 - 1.78	1.49 - 1.55
September	1.76 - 1.83	1.57 - 1.62	1.55 - 1.61	1.71 - 1.78	1.55 - 1.61
October	1.93 - 1.98	1.78 - 1.82	1.74 - 1.80	1.89 - 1.94	1.81 - 1.87
November	2.18 - 2.23	2.06 - 2.10	2.05 - 2.09	2.22 - 2.29	2.07 - 2.13
December	2.65 - 2.80	2.37 - 2.48	2.36 - 2.47	2.68 - 2.75	2.32 - 2.37
Yearly avg.	1.72 - 1.78	1.54 - 1.59	1.53 - 1.58	1.69 - 1.75	1.52 - 1.56
2008:					
January	3.15 - 3.38	2.68 - 2.75	2.67 - 2.74	3.03 - 3.11	2.69 - 2.79
February	3.54 - 3.64	3.25 - 3.38	3.14 - 3.26	3.54 - 3.67	3.34 - 3.44
March	4.45 - 4.59	4.26 - 4.41	4.16 - 4.25	4.16 - 4.40	4.26 - 4.39
April	5.00 - 5.18	4.89 - 4.96	4.88 - 4.95	5.16 - 5.29	4.95 - 5.06
May	5.45 - 5.56	5.16 - 5.26	5.09 - 5.19	5.40 - 5.45	5.18 - 5.27
June	5.54 - 5.59	5.13 - 5.28	5.12 - 5.27	5.40 - 5.45	4.99 - 5.18

See footnotes at end of table.

TABLE 11--Continued  
LOW-CARBON FERROCHROMIUM AVERAGE MONTHLY AND ANNUAL PRICES

(Dollars per pound, contained chromium, unless otherwise noted)

Month	United States <sup>1</sup>				Europe <sup>2</sup>		
	6	7	8	9	1	2	3
2007:							
June	1.46 - 1.51	1.62 - 1.70	1.37 - 1.44	1.26 - 1.32	1.49 - 1.57	1.55 - 1.64	1.59 - 1.69
July	1.50 - 1.55	1.70 - 1.90	1.45 - 1.60	1.30 - 1.40	1.65 - 1.75	1.63 - 1.73	1.62 - 1.75
August	1.47 - 1.52	1.70 - 1.90	1.45 - 1.60	1.30 - 1.40	1.62 - 1.72	1.66 - 1.76	1.63 - 1.76
September	1.50 - 1.56	1.70 - 1.90	1.45 - 1.60	1.30 - 1.40	1.60 - 1.70	1.71 - 1.81	1.68 - 1.78
October	1.68 - 1.75	1.85 - 1.95	1.60 - 1.70	1.60 - 1.65	1.68 - 1.80	1.80 - 1.88	1.78 - 1.85
November	1.91 - 1.98	1.86 - 1.95	1.61 - 1.70	1.61 - 1.66	1.98 - 2.10	2.09 - 2.27	2.12 - 2.26
December	2.01 - 2.08	1.94 - 2.04	1.72 - 1.82	1.64 - 1.71	2.10 - 2.22	2.18 - 2.38	2.22 - 2.42
Yearly avg.	1.47 - 1.51	1.58 - 1.69	1.40 - 1.49	1.29 - 1.36	1.50 - 1.61	1.57 - 1.66	1.59 - 1.68
2008:							
January	2.54 - 2.64	2.25 - 2.41	2.15 - 2.30	1.75 - 1.90	2.65 - 2.80	2.63 - 2.89	2.66 - 2.90
February	3.18 - 3.28	3.07 - 3.17	2.77 - 2.87	2.53 - 2.63	3.16 - 3.26	3.17 - 3.49	3.22 - 3.55
March	4.08 - 4.18	4.42 - 4.49	4.31 - 4.36	4.23 - 4.30	4.44 - 4.61	3.95 - 4.73	4.00 - 4.78
April	4.66 - 4.79	4.90 - 5.00	4.80 - 4.90	4.73 - 4.83	4.85 - 5.05	3.95 - 5.50	4.00 - 5.55
May	5.03 - 5.13	5.05 - 5.15	5.00 - 5.10	4.93 - 5.03	4.85 - 5.05	3.85 - 4.10	4.75 - 5.55
June	5.00 - 5.08	5.52 - 5.61	5.16 - 5.23	5.10 - 5.16	4.85 - 5.05	4.15 - 4.40	5.30 - 5.43

<sup>1</sup>Source for United States 1 price is Platts Metals Week; United States 1 is called United States low-carbon, 0.05% carbon, imported, by Platts Metals Week. Source for United States 2 price is Platts Metals Week; United States 2 is called United States low-carbon, 0.10% carbon, imported, by Platts Metals Week. Source for United States 3 price is Platts Metals Week; United States 3 is called United States low-carbon, 0.15% carbon, imported, by Platts Metals Week. Source for United States 4 price is Ryan's Notes; United States 4 is called 0.05% carbon, imported, North American transaction by Ryan's Notes. Source for United States 5 price is Ryan's Notes; United States 5 is called 0.1% carbon, imported, North American transaction by Ryan's Notes. Source for United States 6 price is Ryan's Notes; United States 6 is called 0.15% carbon, imported, North American transaction by Ryan's Notes. Source for United States 7 price is Metal Bulletin; United States 7 is called United States free market, low carbon, duty paid free on board (f.o.b.) Pittsburgh, 0.05% carbon, 65% min. chromium by Metal Bulletin. Source for United States 8 price is Metal Bulletin; United States 8 is called United States free market, low-carbon, duty paid f.o.b. Pittsburgh, 0.10% carbon, 62% min. chromium by Metal Bulletin. Source for United States 9 price is Metal Bulletin; United States 9 is called United States free market, low-carbon, duty paid f.o.b. Pittsburgh, 0.15% carbon, 60% min. chromium by Metal Bulletin.

<sup>2</sup>Source for Europe 1 price is Platts Metals Week; Europe 1 is called 0.1% carbon, by Platts Metals Week. Source for Europe 2 price is Metal Bulletin; Europe 2 is called 0.1% carbon, average 68%-70% chromium, by Metal Bulletin. Source for Europe 3 price is Metal Bulletin; Europe 3 is called European low-carbon, in warehouse, 0.06% carbon max., 65% chromium, by Metal Bulletin.

TABLE 12  
FERROCHROMIUM SILICON AND CHROMIUM METAL AVERAGE MONTHLY AND ANNUAL PRICES

(Dollars per pound, gross weight, unless otherwise noted)

Month	Ferro-chromium silicon <sup>2</sup>	Chromium metal						
		United States		Europe				
		Aluminothermic <sup>3</sup>		Aluminothermic <sup>1</sup>				
				1		2		
2007:								
June	0.7810	3.65	- 3.75	3.47	- 3.61	4.65	- 4.83	
July	0.7955	3.65	- 3.75	3.45	- 3.63	4.65	- 4.83	
August	0.7584	3.65	- 3.74	3.45	- 3.63	4.65	- 4.83	
September	0.7810	3.65	- 3.70	3.44	- 3.61	4.65	- 4.83	
October	0.8213	3.65	- 3.70	3.45	- 3.59	4.65	- 4.83	
November	0.9120	3.83	- 3.94	3.49	- 3.61	4.65	- 4.83	
December	0.9473	4.59	- 4.71	3.86	- 4.02	4.65	- 4.83	
Yearly avg.	0.7197	3.62	- 3.70	3.34	- 3.48	4.56	- 4.83	
2008:								
January	0.9703	4.65	- 4.75	4.38	- 4.54	4.65	- 4.83	
February	1.0896	4.68	- 4.75	4.51	- 4.68	4.65	- 4.83	
March	1.2125	4.90	- 5.00	4.51	- 4.65	4.65	- 4.83	
April	1.3075	5.05	- 5.13	4.74	- 5.03	4.65	- 4.83	
May	1.4040	5.17	- 5.25	4.97	- 5.21	4.65	- 4.83	
June	1.4518	5.53	- 5.71	5.36	- 5.53	4.65	- 4.83	

<sup>1</sup>Source for Europe Aluminothermic 1 price is Metal Bulletin; Europe Aluminothermic 1 is called alumino-thermic, min. 99% metal by Metal Bulletin; price converted from dollars per metric ton to dollars per pound. Source for Europe Aluminothermic 2 price is Metal Bulletin; Europe Aluminothermic 2 is called western un-degassed AT, min. 99.4% metal by Metal Bulletin; price converted from dollars per kilogram to dollars per pound.

<sup>2</sup>Source for ferrochromium silicon price is Ryan's Notes; ferrochromium silicon is called North American transaction by Ryan's Notes.

<sup>3</sup>Source for United States Aluminothermic price is Ryan's Notes; United States Aluminothermic is called aluminothermic imported chrome metal by Ryan's Notes.