

# Mineral Industry Surveys

**For information, contact:**

Désirée E. Polyak, Vanadium Commodity Specialist  
 National Minerals Information Center  
 U.S. Geological Survey  
 989 National Center  
 Reston, VA 20192  
 Telephone: (703) 648-4909, Fax: (703) 648-7757  
 Email: dpolyak@usgs.gov

Darlene V. Thompson (Data)  
 Telephone: (703) 648-7797  
 Fax: (703) 648-7975  
 Email: dvthompson@usgs.gov

**Internet:** <http://minerals.usgs.gov/minerals/>

## VANADIUM IN NOVEMBER 2018

Reported domestic consumption of vanadium in November 2018 was slightly less than that of the previous month and 16% less than that of November 2017. Consumer stocks of all forms of vanadium were 202 metric tons (t) at the end of November, an increase from 155 t at yearend 2017 (table 1).

According to CRU Group (2019), U.S. ferrovanadium (FeV) prices ranged from \$55.156 to \$56.556 per pound of contained vanadium in November 2018, compared with \$51.500 to \$52.944 per pound in October 2018. European FeV prices ranged from \$120.333 to \$123.444 per kilogram of contained vanadium in November 2018, compared with \$111.444 to \$114.556 per kilogram in October 2018. CRU Group discontinued publishing U.S. vanadium pentoxide (V<sub>2</sub>O<sub>5</sub>) prices from July 2017 onward. The Chinese V<sub>2</sub>O<sub>5</sub> prices ranged from \$22.000 to \$23.000 per pound of contained vanadium in both October and November 2018 (fig. 1).

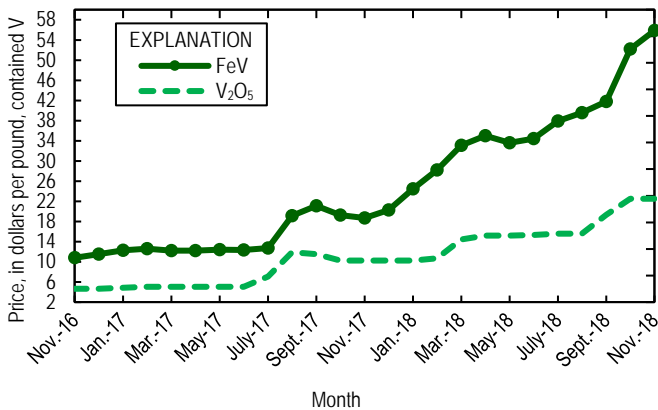


Figure 1. Average monthly prices for FeV and V<sub>2</sub>O<sub>5</sub> from November 2016 through November 2018. Prices for FeV are United States prices, and prices for V<sub>2</sub>O<sub>5</sub> are United States prices from November 2016 through June 2017 and Chinese prices from July 2017 through November 2018. Source: CRU Group.

**Reference Cited**

CRU Group, 2019, Noble alloys and minor metals prices: CRU Group, February. (Accessed February 14, 2019, via <http://www.crugroup.com/>.)

*List services and web feed subscribers are the first to receive notification of USGS minerals information publications and data releases. For information on how to subscribe, go to <http://minerals.usgs.gov/minerals/>.*

TABLE 1  
U.S. CONSUMPTION AND CONSUMER STOCKS OF VANADIUM, BY FORM<sup>p,1</sup>

(Kilograms, contained vanadium)

	2018					
	October		November		January–November	
	Consumption	Stocks	Consumption	Stocks	Consumption	Stocks
Ferrovandium <sup>2</sup>	222,000	160,000 <sup>r</sup>	218,000	164,000	2,440,000	164,000
Vanadium-aluminum alloy and other forms <sup>3</sup>	21,100	37,800	21,100	37,800	368,000	37,800
Total	243,000	198,000 <sup>r</sup>	239,000	202,000	2,810,000	202,000

<sup>p</sup>Preliminary. <sup>r</sup>Revised.

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

<sup>2</sup>Includes other vanadium-iron-carbon alloys as well as vanadium oxides added directly to steel.

<sup>3</sup>Includes vanadium-aluminum alloy, other vanadium alloys, vanadium metal, vanadium pentoxide, vanadates, chlorides, and other specialty chemicals.

TABLE 2  
U.S. CONSUMPTION OF VANADIUM, BY END USE<sup>1</sup>

(Kilograms, contained vanadium)

	2018		
	October	November	January– November
Steel:			
Carbon	W	W	W
Full alloy	101,000	101,000	1,160,000
High-strength low-alloy	W	W	W
Stainless and heat resisting	4,930	4,940	54,200
Tool	W	W	W
Total steel	106,000	106,000	1,210,000
Superalloys	W	W	W
Miscellaneous and unspecified <sup>2</sup>	W	W	W
Total	243,000	239,000	2,810,000

W Withheld to avoid disclosing company proprietary data; included in "Total."

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

<sup>2</sup>Includes cast irons, alloys excluding steel and superalloys, chemical and ceramic uses, and other miscellaneous and unspecified uses.

TABLE 3  
U.S. IMPORTS FOR CONSUMPTION OF VANADIUM PRODUCTS<sup>1</sup>

(Kilograms, unless otherwise specified)

Material	HTS <sup>2</sup> Code	2018								
		October			November			January–November		
		Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)
Vanadium bearing ash and residues	2620.40.0030, 2620.99.1000	1,910,000	187,000	\$6,030,000	3,070,000	378,000	\$8,470,000	24,100,000	2,480,000	\$54,200,000
<b>Chemical compounds:</b>										
Vanadium pentoxide (anhydride)	2825.30.0010	528,000	525,000	21,600,000	412,000	410,000	19,900,000	4,320,000	4,230,000	149,000,000
Vanadium oxides and hydroxides, other	2825.30.0050	9,000	6,230	441,000	--	--	--	149,000	97,600	5,450,000
Vanadium sulfates	2833.29.3000	4,200	4,200	48,500	--	--	--	12,300	9,370	124,000
Vanadates	2841.90.1000	91,000	64,300	3,020,000	52,100	38,700	1,860,000	534,000	336,000	14,300,000
Ferrovandium	7202.92.0000	432,000	314,000	28,500,000	385,000	275,000	27,500,000	3,920,000	2,920,000	211,000,000
Vanadium metal, including waste and scrap	8112.92.7000	--	--	--	--	--	--	35,500	26,700	1,810,000
Vanadium and articles thereof <sup>3</sup>	8112.99.2000	18,100	11,800	1,130,000	54,400	35,400	2,870,000	431,000	281,000	17,200,000
<b>Total</b>		<b>2,990,000</b>	<b>1,110,000</b>	<b>60,800,000</b>	<b>3,970,000</b>	<b>1,140,000</b>	<b>60,600,000</b>	<b>33,500,000</b>	<b>10,400,000</b>	<b>453,000,000</b>

-- Zero.

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

<sup>2</sup>Harmonized Tariff Schedule of the United States (HTS).

<sup>3</sup>Aluminum-vanadium master alloy consisting of 35% aluminum and 64.5% vanadium.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS AND EXPORTS OF FERROVANADIUM, VANADIUM PENTOXIDE (ANHYDRIDE)  
AND OTHER OXIDES AND HYDROXIDES OF VANADIUM<sup>1,2</sup>

(Kilograms, gross and contained weight)

Country or locality	HTS <sup>3</sup> code	2018					
		October		November		January–November	
		Gross weight	Contained weight	Gross weight	Contained weight	Gross weight	Contained weight
<b>Imports for consumption:</b>							
Vanadium pentoxide (anhydride) <sup>4</sup>	2825.30.0010						
Brazil		400,000	398,000	200,000	199,000	2,060,000	2,050,000
Korea, Republic of		20,000	19,600	20,000	19,600	100,000	98,100
South Africa		106,000	105,000	192,000	191,000	1,370,000	1,360,000
Other [4 countries and (or) localities]		2,600 <sup>r</sup>	1,910 <sup>r</sup>	--	--	796,000	723,000
Total		528,000	525,000	412,000	410,000	4,320,000	4,230,000
Other oxides and hydroxides of vanadium:	2825.30.0050						
Austria		9,000	6,230	--	--	9,000	6,230
Other [3 countries and (or) localities]		--	--	--	--	140,000	91,400
Total		9,000	6,230	--	--	149,000	97,600
Ferrovandium	7202.92.0000						
Austria		194,000	148,000	138,000	105,000	2,080,000	1,590,000
Canada		162,000	122,000	162,000	126,000	969,000	757,000
Japan		19,100	9,720	18,800	9,970	184,000	103,000
Latvia		21,900	12,300	20,000	9,400	224,000	121,000
Ukraine		20,000	10,300	38,300	20,300	83,300	43,400
Other [5 countries and (or) localities]		14,900	11,900	7,720	4,190	381,000	303,000
Total		432,000	314,000	385,000	275,000	3,920,000	2,920,000
<b>Exports:</b>							
Vanadium pentoxide (anhydride) <sup>4</sup>	2825.30.0010						
India		62,500	NA	66,100	NA	453,000	NA
Other [5 countries and (or) localities]		--	--	--	--	87,100	NA
Total		62,500	XX	66,100	XX	540,000	XX
Other oxides and hydroxides of vanadium	2825.30.0050						
Canada		6,500	NA	234	NA	7,260	NA
Other [4 countries and (or) localities]		--	--	--	--	45,100	NA
Total		6,500	XX	234	XX	52,400	XX
Ferrovandium	7202.92.0000						
Canada		61,400	46,100	45,700	34,200	197,000	147,000
India		--	--	19,000	14,300	19,000	14,300
Israel		--	--	928	696	928	696
Korea, Republic of		--	--	7,080	5,310	19,200	14,400
Mexico		54,800	41,100	88,300	66,200	489,000	329,000
Other [5 countries and (or) localities]		--	--	--	--	23,300	15,500
Total		116,000	87,100	161,000	121,000	748,000	521,000

<sup>r</sup>Revised. NA Not available. 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>Presentation of monthly data is based on the quantities (gross weight or contained weight) of the five leading countries and (or) localities in November.

<sup>3</sup>Harmonized Tariff Schedule of the United States (HTS).

<sup>4</sup>May include catalysts containing vanadium pentoxide.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS AND EXPORTS OF ALUMINUM VANADIUM MASTER ALLOY, VANADIUM BEARING ASH AND RESIDUES,  
VANADIUM SULFATES, VANADATES, VANADIUM METAL AND U.S. IMPORTS OF SLAG<sup>1,2</sup>

(Kilograms, gross and contained weight)

Country or locality	HTS <sup>3</sup> code	2018					
		October		November		January–November	
		Gross weight	Contained weight	Gross weight	Contained weight	Gross weight	Contained weight
<b>Imports for consumption:</b>							
Slag, from the manufacture of iron and steel	2619.00.9000						
Canada		436,000	NA	141,000	NA	70,900,000	NA
Finland		--	--	3,760	NA	12,100	NA
Mexico		100,000	NA	145,000	NA	596,000	NA
Other [5 countries and (or) localities]		23,800 <sup>r</sup>	NA	--	--	70,800,000	NA
Total		560,000	XX	290,000	XX	142,000,000	XX
Vanadium bearing ash and residues	2620.40.0030, 2620.99.1000						
Canada		1,910,000	187,000	1,730,000	169,000	21,500,000	2,110,000
Mexico		--	--	1,340,000	208,000	2,340,000	336,000
Other [4 countries and (or) localities]		--	--	--	--	303,000	34,600
Total		1,910,000	187,000	3,070,000	378,000	24,100,000	2,480,000
Vanadium sulfates	2833.29.3000						
Austria		4,200	4,200	--	--	4,200	4,200
Other [2 country and (or) locality]		--	--	--	--	8,060	5,170
Total		4,200	4,200	--	--	12,300	9,370
Vanadates	2841.90.1000						
China		15,300	15,000	26,600	24,000	105,000	82,800
Germany		--	--	6,670	2,350	19,900	7,120
Taiwan		75,600	49,300	18,900	12,300	284,000	185,000
Other [6 countries and (or) localities]		110 <sup>r</sup>	26 <sup>r</sup>	--	--	125,000	61,000
Total		91,000	64,300	52,100	38,700	534,000	336,000
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
China		--	--	18,100	11,800	132,000	88,100
Russia		18,100	11,800	36,300	23,600	294,000	189,000
Other [9 countries and (or) localities]		1 <sup>r</sup>	1 <sup>r</sup>	--	--	40,200	30,900
Total		18,100	11,800	54,400	35,400	466,000	308,000
<b>Exports:</b>							
Vanadium bearing ash and residues	2620.50.0000, 2620.99.1000						
Belgium		--	--	158,000	NA	298,000	NA
Germany		--	--	19,800	NA	176,000	NA
Korea, Republic of		--	--	116,000	NA	389,000	NA
Mexico		3,050	NA	7,880	NA	804,000	NA
Other [5 countries and (or) localities]		--	--	--	--	303,000	NA
Total		3,050	XX	302,000	XX	1,970,000	XX
Vanadium metal, including waste and scrap and aluminum-vanadium master alloy	8112.92.7000, 8112.99.2000						
Japan		--	--	5,340	NA	36,600	NA
Other [14 countries and (or) localities]		4,190 <sup>r</sup>	NA	--	--	161,000	NA
Total		4,190	XX	5,340	XX	198,000	XX

<sup>r</sup>Revised. NA Not available. 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>Presentation of monthly data is based on the quantities (gross weight or contained weight) of the five leading countries and (or) localities in November.

<sup>3</sup>Harmonized Tariff Schedule of the United States.

Source: U.S. Census Bureau.